The Influence of Environmental Innovations on Financial Performance and Vice-Versa: A Case Study on the Japanese Chemical Industry

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A Thesis Submitted in Partial Fulfillment
Of the Requirements for the Degree of
Master of Business Administration

Graduate School of Management
Master's Thesis
Ritsumeikan Asia Pacific University
July 2012

Declaration of Originality

I, Matthew Vincent Barkley, herby declare that this research thesis is of my own original work, that all reference sources have been accurately reported and acknowledged, and that this document has not previously, in its entirety or in part, been submitted to any university to gain academic qualification

Matthew Vincent Barkley July 13th, 2012

Acknowledgement

I would like to extend my sincerest gratitude to a number of individuals, who without their continued support this thesis would not have been possible.

Without a doubt, Professor Michael M.A. Cortez has been one of the most influential and helpful role models during my studies at APU. Not only does he tolerate me constantly asking for assistance, but he gladly offers it, always going the extra mile.

I would also like to thank my parents, Dr. and Mrs. G.W. Barkley, for their unwavering support and guidance. Being part of an academic family, it has inspired me to strive in developing my academic career and, against all odds, achieve this pinnacle.

Professor Otake Toshitsugu, Professor Shayan Ebrahim, and Professor Chen Shu-Ching, the interim review was an inspiration in the right direction and I appreciate your insightful comments. Thank you for taking the time out of your busy schedules to read and evaluate this thesis.

There are many other professors at Ritsumeikan Asia Pacific University I would like to thank as well. I will take the lessons learned from the experienced and learned teaching staff who always does more than they are asked. Whether it be meeting at unimaginable hours at night, making sure the material at hand was learned, or giving general advice on life, I will take these lessons to heart as I continue on with my career.

Lastly, I would like to thank my loving wife Katharina Drokur. You have been a rock I can lean on in times of desperation and need. Constantly pushing to

better myself, you make me want to be a better student, friend, and husband. Thank you for never giving up on me and always being by my side.

It is with great gratitude to all of you who have guided me that I submit this thesis to the thesis committee of Ritsumeikan Asia Pacific University in partial fulfillment of the requirements for the degree of Masters of Business Administration. Thank you.

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Abstract

With ever changing climates there seems to be a more environmentally aware public. Furthermore, objectives of Agenda 21 and the Kyoto Protocol have increased the pressure on both the public and private sectors around the globe. While the manufacturing industry is necessary to sustain our living standards, it simultaneously depletes resources, drives wasteful consumerism, contributes to pollution, and has been blamed for the destruction of rainforests and other natural habitats. In order to combat such accusations, demonstrate compliance with laws, and appeal to the public that the firm is in fact taking measures to be ever more 'green', non-financial sustainability reports are increasingly common. The chemical industry is a particularly significant industry because they are incorporated into end-user products manufactured by the staple of Japanese industries—electronic and automotive among others. In other words, the end user may not hold the chemicals in their hands, but without the chemical industry, users would not have a product.

Separate from traditional financial reports submitted for stakeholders, firms, per the Ministry of Environment's guide on environmental accounting, compare the estimated economic benefit against the cost of environmental product innovation and processes. However, because the competitive advantage gained from such environmental practices is generally ignored an empirical analysis should be conducted to determine whether or not firms benefit from more than just obvious economical factors by comparing financial performance variables with environmental innovations.

This study incorporates aforementioned financial performance variables with environmental innovations (costs and investments). The expected results of this study is that there will be positive impacts of revenue generation, profitability (net income), firm size (assets), liquidity (current assets), shareholder value (equity), and a negative impact of accounting risks such as long-term debt and liabilities. In order to further validate the results, I explore the causality of the relation. The question is whether firms generally accept the resource based view where current environmental innovations improves financial performance or fall under the slack availability of resources where successful financial performance from previous periods determines the amount of environmental investments. Alternatively, there is the expectation that certain firms will engage in a virtuous cycle where each principle concept will benefit the other in cycle.

The methodology of analyzing the empirical evidence is comprised of three primary tests. A sample size of thirty-one firms under the criteria that a) firms must have environmental accounting from 2001-2010 and b) primary source of revenue is as a supplier to other end-user product manufacturers were

selected from the 154 Tokyo Stock Exchange listed chemical firms. A panel regression is then performed to establish an existing relationship between environmental innovations and financial performance variables in two directions. Simultaneously, heteroskadicity and auto-correlation are checked. The third test uses a Granger causality test to reveal the true direction of the relation established in the panel regression.

The statistically rendered results support the proposed hypothesis. However, in light of economic crisis or other dynamic shifts in the industry may render the results insignificant as is demonstrated through the multiple longitudinal tests.

Key Words: environmental innovations, environmental CSP, green supply chain, Japanese, Chemical, financial performance, sustainability

Introduction

Background of the Study

Over the course of the last century, there have been an increasing number of vehicles on the road, products purchased and wasted, and general pollution. This pollution has led to the destruction of habitats, land and water degradation, climate change, and various other factors our planet was not intended for. If nothing else, rising water levels threatening to swallow island nations such as the Maldives and Vanuatu should indicate that environmental conservation is needed to create a sustainable future for following generations. However, an argument can be made that such innovation is expensive and uneconomical. Although sustainability may be an expensive endeavor, we cannot simply ignore this need.

If we can agree that environmental innovations and conservation efforts are mandatory to sustain this planet, we then need to ask who is supposed to foot the bill. Is it the responsibility of the nations at risk? Given the lack of economic power of the most afflicted nations, this may not be the best solution. Furthermore, in the case of rising water levels, the Maldivians and Vanuatuans economy likely did not contribute to this phenomena nearly as much as the economy of powerhouses such as Japan, China, and the U.S. If it is the responsibility of economic powerhouses to sustain the environment, then they must implement regulations mandating how people and firms treat not only the environment that they live in but also the environment they cannot see. Hart (1995) argues that multi national companies are uniquely situated through their location of operations, resources, and technology to conserve the environment.

Furthermore, the average consumer is likely not aware of what natural resources are depleted and environments afflicted in manufacturing of their product.

What motivates the firms, however, to maintain environmentally friendly operations is of significance. Without a doubt, government regulations monitoring the firms are of some significance. As institutional theory (DiMaggio & Powell, 1983) would state, such government regulations are a coercive pressure for environmental innovation. On the other hand, Zhu et al (2010) find that Japanese firms are strongly subjected to normative pressures where public perception is the main driver of environmental activities. However, firms trying to legitimize themselves in the eyes of the public come at a cost. Corporate Social Responsibility (CSR), Corporate Social Performance (CSP), and Responsible Care sustainability reports indicate that the economic benefit of environmental performance far outweighs the costs of environmental innovation.

This thesis attempts to identify a relation between environmental costs and financial performance that goes beyond the obvious direct benefit-cost relation. If firms realize that environmental performance positively drives financial performance such as revenues, profitability, firm size, and shareholder value while simultaneously reducing their accounting risks such as long term debt, current liabilities, and total liabilities, the managers may be motivated to manage their environmental responsibilities with more tenacity. However, because environmental innovation efforts are costly in nature, I will examine the opposite relation as well to verify whether financial performance is the main motivator for environmental innovations.

Problem Statement

While there is literature exploring whether or not corporate social responsibility will in fact benefit financial performance, this study aims to add to the debate from an empirical perspective. There are three questions this paper tries to answer. First, is there an empirical relationship between environmental innovations and financial performance? Second, do environmental innovations within the chemical industry influence financial performance in succeeding years? Or, thirdly, does the financial performance determine future environmental investments? With scholars generalizing different answers to each of these questions, perhaps a specific look at the Japanese chemical industry will reveal definitive results for this particular segmentation.

For the purpose of this research study, the terms corporate social responsibility (CSR) and corporate social performance (CSP) may be interchanged for environmental innovations. Environmental innovations refer to the net of environmental costs and environmental capital expenditures for each of the six categories of environmental costing including business area costs, upstream/downstream costs, management costs, research and development costs, social activity costs, and environmental damage costs.

Objectives of the Study

This case study aims to:

1. Determine the impact of environmental innovations of revenue generation (revenues);
2. Determine the impact of environmental innovations on profitability (net income);
3. Determine the impact of environmental innovations on firm size (assets);
4. Determine the impact of environmental innovations on liquidity (current assets);
5. Determine the impact of environmental innovations on accounting risk (long-term debt);
6. Determine the impact of environmental innovations on shareholder value (owner's equity);
7. Determine the impact of environmental innovations on cost reduction (cost of sales);
8. Determine the impact of all aforementioned financial performance measurements on environmental innovations;
9. Determine the causality and directionality of environmental innovations and aforementioned financial performance measures;
10. Determine impact of the manufacturing output of automotive and electronic industries on the financial performance of the chemical industry.

Significance of Study

With global consumerism, mass production, and the consequent waste, we are straining and destroying our natural eco-system to provide for our species. Recognized and addressed by global economies at environmental summits as a growing problem, an ever-increasing awareness of environmental protectionism is abundantly clear in literature. As the third largest economy in the world, Japan leads with some of the strictest environmental laws on the planet (Zhu et al, 2010). Because the product manufactured by the firm can cause environmental damage through the manufacturing process, use, and disposal, much of the cost falls on the shoulders of the firm. While the firm engages environmental innovations in order to create legitimacy and stakeholder value, there is little direct economic benefit stemming from environmental investments in the chemical industry. Accordingly, political parties and segments of the public claim that environmental investments are nothing more than costly and reduce the bottom line of the firm. However, when environmental impact is a product of population, affluence, and technology where population and affluence are unstable, we must control the technology factor (Graedel & Allenby, 1995). Therefore, literature is required to guide and educate the public and private sectors.

Because the chemical industry produces fewer end user products and is instead part of the supply chain, they have a unique opportunity to largely influence the technology aspect of our environmental impact. Because chemicals are handled by third party manufacturers who incorporate the chemicals into end-user products, chemical firms should conduct life-cycle assessments keeping in mind that the benefit of the product should far outweigh the costs of environmental damages. However, rather than viewing environmental innovations as a necessary evil of doing business, it would be encouraging for firms to truly adopt the idea that environmentalism creates business sustainability and even new business opportunities.

Regardless of if firms adopt environmental practices in order to simply be compliant or to signify legitimacy to stakeholders, it is significant they have a framework that links environmental innovations to financial performance. Therefore, this research paper aims to combine traditional accounting practices with newer environmental accounting mechanisms by empirically analyzing data with the objective of providing answers significant to the Japanese chemical industry.

Literature Review

Introduction

This literature review aims to examine the call for, the justification and adaptation of, and benefits of environmental innovations. Environmental innovation is an established as a necessity. Environmental innovation efforts are then criticized as being a mere cost center. By providing literature that states the contrary, this thesis is justified in exploring the relation between financial performance and environmental innovations. Furthermore, qualitative evidence is provided to demonstrate how firms have been able to turn environmental innovations into profit centers. However, as the literature will show, there is a growing demand for empirical evidence to validate that previous cases are more than unique, isolated cases. A call to such demands is the automotive industry case study, which will demonstrate that empirical evidence does exist to support environmental innovations positive affects on the bottom line. The chemical industry will be introduced as a portion of the supply chain, however, contrasting the automotive industry, which manufactures end-user products. Even though efforts have been made in the chemical industry to promote sustainability, there is a lack of empirical evidence tying such innovation efforts to financial performance. Theoretical, conceptual, and operational frameworks will follow the literature review.

Literature Review

Regardless of whether or not industries are inclined to invest in the environment, certain regulations such as the Kyoto Protocol of 1997 put stringent requirements on governments in order to reduce greenhouse gas (GHG) emissions. Jaggi, Freedman, and Martin (2011) suggest that regardless of whether firms are regulated by their respective governments to reduce GHG emissions, stakeholders are increasingly evaluating the firm based on their pollution reduction strategies as part of their performance assessments. Many of the governments that have ratified the Kyoto Protocol have allowed for voluntary disclosures, rather than mandatory pollution disclosures, under the assumption that managers would be enticed to gain shareholder confidence by revealing such information. Furthermore, because not all industries are subject to pollution assessment by investors, a mandatory disclosure would increase transaction costs for unrelated industries. For example, in India, "pollution disclosures are more critical to firms belonging to the polluting industries, such as coal burning plants, steel, automobile, chemicals, paper products etc., than firms from other industries" (Jaggi, Freedman, and Martin, 2011).

Considering that the first phase of the Kyoto Protocol ends in 2012, it is expected that governments and firms would have already implemented mechanisms in order to meet their country-specific emission reduction requirements. Naturally, using renewable resources, increasing efficiency, and reducing the use of fossil fuels would be logical ways to meet the Kyoto Protocol, and it would be logical for firms to boast about such accomplishments to their shareholders.

By collecting data from multiple sources including the Carbon Disclosure Project (2007), Jaggi, Freedman, and Martin (2011) analyzed the amount of information and disclosures available to stakeholders. The results of their analysis demonstrated that Indian companies disclose less than their French, German, UK, Japanese, and Canadian counterparts. Results further showed that larger firms disclose more information to the public likely because they have the resources to do so. An industry group analysis showed that pharmaceuticals, chemicals, utilities, and energy industries also disclose more information because they are largely considered to be the "polluting" industries.

In order to redefine these polluting industries, Hart and Milstein (1999) suggest that we are entering an age of creative destruction as outlined by Schumpeter nearly seventy years ago. That is to say that large incumbents cannot be trapped in their own flag ship product and ignore new and upcoming technologies or concerns. Managers must have the foresight to sift through the chaos of change in order to not be "held hostage by their current technology or market position" (Hart and Milstein, 1999). We are now at the brink of this new age of creative destruction with environmental concerns and sustainable development as the catalyst. Furthermore, rather than making continuous improvements, this pair calls for radical innovation. This is to say that industry wide collaboration may improve pollution prevention, however, without fundamental innovation, "the dynamics of creative destruction will work against firms that rely only on incremental improvements and fail to change the fundamental manner in which they provide products, processes, and services." (Hart and Milstein 1999). For example, following disasters, the chemical industry called on itself to improve stringent regulatory measures. On the surface, this is nothing but positive, if not necessary. According to Schumpeter, however, it is generally not the incumbent that revolutionizes the market so much as the new entrant. Therefore, with more entry barriers, the likelihood of new entrants revolutionizing the chemical industry is diminished.

At the time of their study, Wackernagel and Rees (1996), determined that if the global population were as consumerist societies as North America is, it would require three of our planets to sustain ourselves. This alone demonstrates that we fail to meet the definition of sustainability where we can meet this generation's needs without compromising the next. Following Schumpeter's analysis of creative destruction, Hart and Milstein (1999) suggest that it is up to the visionaries, entrepreneurs, and innovators to take advantage of this business opportunity to provide a sustainable future. Even in an industry filled with incumbents, as is the chemical industry, major players are recognizing the need for radical innovation for sustainable development.

In the consumerism economy where one-sixth of the population can practically afford anything and consumes seventeen times more than their counterpart in an emerging economy (Wackernagel and Rees, 1996), the objective of the corporation should be to reduce their ecological footprint. Hart and Milstein (1999) argue that when even large investments do little to improve performance for maturing technologies, it opens the windows for glass shattering creative destruction. Examining the current automotive industry, we can see this to be the case. Even with large investments, the fuel efficiency of automobiles only improves slightly. However, Plug-In Hybrid Vehicles, Electric Vehicles, and the development of the Hydrogen car dramatically reduces or even eliminates the use of fossil fuels throughout its lifecycle. One could conclude that environmental technologies in a consumerist economy will develop once the cost of incremental improvements outweighs that of radical innovation.

The emerging economy is characterized by having basic needs met with little room for lavish purchases. While approximately one third of the population lived in these conditions when Hart and Milstein did their study in 1999, it was estimated that two thirds of the population will live in this area within the next few decades (Hammond, 1998). This implies that, with a growing global population, the emerging economy cannot sustainably develop by relying on hand-me-down technologies from the consumerist economy. Furthermore, growing demand for materials will reduce the sustainability of this economy as materials diminish. On the other hand, a 1995 U.S.-Asia Environmental Partnership report estimated that manufacturer equipment doubles every six years. With this in mind, Hart and Milstein (1999) suggest that manufacturers must implement significantly more environmentally friendly equipment, essentially leap-frogging current technologies and relying heavily on renewable resources. In essence, emerging economies will develop ecological technologies once demand for resources far outweighs the supply, as is with the demand for water in the agriculture industry.

Lastly, the survival economy refers to approximately half of the population whose needs are not yet met. Dominated by poverty and lack of infrastructure, it seems to be a highly risky and unstable market to invest in. However, seeing as how the majority of this population are subsistence based and live off of nature, not manufactured goods, there will be an increased degradation of land and water resources as the bulk of global population growth will be in this survival economy (Hart, 1997). Managers must recognize that there is a large demand for products that many of us take for granted. For example, Arvind Mills developed inexpensive jeans through a innovative delivery system that widely undercut their competitors. Energy giants provide stand-alone renewable energy technologies, which are too expensive in the consumerist economy. However, considering that energy companies cannot pass off the high cost of laying electricity lines to remote village users, wind and photovoltaic renewable energies suddenly become the less expensive option. In such manners, Hart and Milstein (1999) demand that corporations relinquish treating these economies as the dumping ground for outdated, dangerous, unsustainable technologies and instead take advantage of this multi-billion person market through sustainable technologies.

Even though the possibility for profit maximization through environmental innovations exists, incumbent firms experience difficulties adjusting to such radically different markets due to their size. Rather, firms may adhere to minimum regulations in order to maximize profits according to the neo-classical economic model where benefit must exceed cost. However, even the largest of incumbents to not necessarily conform to such confines. For example, all car manufacturers in the United States are subject to the Corporate Average Fuel

Economy (CAFÉ), which was initially enacted in 1975 by Congress in wake of the Arab Oil Embargo with aims at doubling fuel economy by 1985. If wanting to simply maximize profits, the automotive industry would have met minimum requirements; however, we see that the automotive industry goes above and beyond regulatory requirements, incurring higher costs.

Take, for example, Honda, Nissan, and Toyota. Although these manufacturers are innately Japanese, they are nonetheless domestic powerhouses in the United States. All three of these corporations are taking part in investing and developing automobiles fueled off Biofuel, Plug-in Hybrid Vehicles, Fuel Cell Electric Vehicles, and Hydrogen Vehicles. Because investing in R&D to meet federal regulations is already costly, management decides to invest an incrementally higher amount in order to exceed regulations. Furthermore, having studied the Japanese automotive industry, Cortez and Cudia (2011) conclude that environmental investments positively affect the industry's financial performance. By investing in technologies that exceed regulations, automotive firms may gain a competitive and first mover advantage in a traditionally polluting fossil fuel industry and thus propel them as a pioneer for the first Green Car manufacturer. This process becomes a win-win for both regulators and the industry.

Improved fuel efficiency should also benefit the consumer. Gasoline prices in the U.S. have risen from just above one USD per gallon from April of 1993 to four USDs per gallon in 2011. This change indicates that there is a higher demand for oil than what the big oil companies can supply. Furthermore, the economic impact of such gasoline price hikes are most likely not welcomed, especially during this time of recession. Unfortunately, however, gasoline is a staple for the automotive industry and we should expect gasoline price hikes in the immediate future due to the lack of substitutes to the fossil fueled light vehicle (personal vehicle).

The economics of the future fossil fueled automotive industry is even more daunting. According to McAuley (2003), 96 percent of the world's transportation industry is reliant on oil while a third of all domestic energy use is consumed by the automotive industry in the United States. While there are approximately one billion light vehicles circulating worldwide, it is estimated that there will be around 2.5 billion by the year 2050 according to the U.S. Department of Energy (2001). Gas prices are rising due to current demand of oil with relation to its supply. Furthermore, if we assume that 2.5 times more vehicles over the next fifty years equates to 2.5 times more demand, we can only imagine what the price of this limited fuel resource is going to be. While environmental investments have oft been considered costly and not economical, given the statistics and trends, it would seem that *not* investing in green vehicles would become economically detrimental.

Economic reasoning aside, there are ample arguments to suggest the need for environmental investments in the automotive industry. According to Pacala and Socolow's (2006) "Plan to Keep Carbon in Check", we are generating seven billion metric tons of carbon per year, worldwide. According to their studies, they conservatively estimate that we will double carbon emissions to 14 billion metric tons per year by 2056. These researchers divide todays carbon emissions into seven equal slices of pie, allocating 1 billion metric tons of carbon emissions to the automotive sector with the current fuel efficiency and carbon emissions. Rather than taking an idealistic, utopian approach of eliminating automotive carbon emissions, they suggest that manufacturers double fuel efficiency in order to meet the doubling demand for vehicles. Logically, if we can have two cars producing the same amount of emissions in 2056 as one car is now, there will be a minimal net increase in carbon emissions from the automotive industry.

As has been demonstrated above, the automotive industry is a prime example of how the popular perception that environmental investments are costly is void. In fact, there is evidence to suggest that economic investments by the automotive industry improve financial performance measures. Furthermore, as Pacala and Socolow (2006) have demonstrated, environmental investments in the automotive industry is practically a must for a healthier global environment. At the end of the day, there will be a win-win-win-win situation for the industry-the population-regulators-and the environment.

In order to validate that economic factors drive environmental innovations, I review Cortez (2010) testing for this relation. By selecting Japanese automotive firms, it is established that revenues, profitability, firm size, and shareholder value is a driver of environmental innovations. However, because environmental costs are considered to be a burden, it is not entirely surprising that environmental innovation is dependent on solid positive financial performance. Therefore, Cortez further analyzes whether or not environmental innovations will drive financial performance. In proving that aforementioned financial variables are also reliant on environmental innovation, I pose the argument that the environment is not only a cost center but also a profitability driver. By contradicting previous literature stating that environmental innovations merely deplete resources, the evidence further suggests that going green is a positive financial influence.

Although literature finds that creative destruction is necessary (Hart & Milstein, 1999) to sustain our environment and such innovations can be economically viable (Cortez, 2010; Hart, 1997; Hart & Milstein, 1999), we should explore the dynamics of the chemical industry before testing the hypotheses. Jenk, Agterberg, and Droescher (2004) define industrial sustainability as "employing technologies and know-how to use less material and energy, maximizing renewable resources as inputs, minimizing generation of pollutants or harmful waste during product manufacture and use, and producing recyclable or biodegradable products." While this may seem like a mouthful, it is really very simple: Increase renewable inputs and outputs while minimizing harmful inputs and outputs. Because the chemical industry is at the base of the value chain and enables other processes along the value chain, these three scholars argue that the chemical industry is a prime target to "embrace and drive the challenge of industrial sustainability" (Jenk, Agterberg, and Droescher, 2004). Furthermore, they argue that the chemical industry emits only 4 percent of global carbon emissions while contributing 9 percent of global trade, the chemical industry has a long history of innovation, and there are many regulatory and self-monitoring mechanisms in place to make the industry greener.

While in the past, technology was partially blamed for environmental degradation, however, the OECD Environmental Outlook in Paris of 2001, recognized that harnessing technology was the key for sustainability while benefiting the economy. The chemical industry is primarily challenged to incorporate their limited materials through harmless processes at an acceptable cost and with great safety. Anastas and Warner (1998) provide framework to reduce environmental impacts of the total process rather than just the product while Anastas, Heine, and Williamson (2000) go one step further to demonstrate how to do so through given technologies. However, Jenk, Agterberg, and Droescher (2004) suggest that though such processes and technology may exist in order for these suggestions to be adopted, the correct market conditions, cost-effective regulation, and appreciation by society must align. Without such conditions, there will likely be fewer investments to pursue environmental friendliness.

Given that technologies should be both economical and environmentally friendly to be considered sustainable, these three researchers have found an example that fits the bill. With only 4 percent of the 200 billion tons of biomass naturally produced per year being used by man (Jenk, Agterberg, and Droescher, 2004), biomass becomes the next biggest thing that can serve as an energy resource and a resource used for chemicals, materials, and end products. Within the chemical industry, the biomass research is aimed at a) replacing fossil fuels through renewable biomass energies b) replace traditional chemical process with bioprocesses and c) to develop bio products include chemicals, plastics, and polymers. Such research has led to the development of renewable biofuels, which can reduce carbon emissions, and bio-herbicides that reduce "waste streams" while promoting renewable resources.

While Jenk, Agterberg, and Droescher (2004) note that, historically, the chemical industry was more concerned with end-of-pipe solutions, Allen and Shonnard (2001) argue that products are assessed throughout their entire lifecycle. Not an uncommon phrase, the Life Cycle Assessment assesses the net environmental impact a product has including its raw materials, production processes, impact during useful life, and the disposal of the product. Because chemical industries are almost always involved in the development of most any product, it is significant that they reduce what impact they can. BASF developed a method of dyeing denim jeans blue through a electrochemical process that was more environmentally friendly than other processes: their market share increased from 2 percent to 40 percent (Jenk, Agterberg, and Droescher, 2004). Furthermore, contrary to popular belief, it is in fact feasible to produce ecological chemical products for less than their unsustainable counterparts as BASF demonstrates in their production biodegradable thermal plastics. Even soybeans can replace traditional fossil fuels as Dow Chemical demonstrated in its development of its renewable carpet backing plastics. The purpose is not to boast about the success of the chemical industry's implementation of ecological products, but that it is in fact possible to reduce the Life Cycle ecological footprint while providing greater functionality at a lesser cost than their traditional counterpart.

The chemical disaster in Bhopal India of 1984 attracted much attention to the chemical industry and their standards of safety. In reaction to the disaster the chemical industry adopted a 'benign by design' policy, which can be cost effective (Kletz, 1990) and thus sustainable. Furthermore, the chemical industry is straying further away from an inherently more wasteful single-stage batch process and moving towards a continuous process. When single-stage batches are made (essentially a large batch all at once), there is 2-3 times the waste as the continuous process which applies equal heat, etc. to the entire process and thus improving purity of a chemical. Through reducing hazardous materials, increasing use of safe materials, and process minimization, the chemical industry is on a natural course towards ecological friendliness with the objective to have byproducts of a natural and safe nature such as H20 (Jenk, Agterbeg, and Droescher, 2004).

While the chemical industry still has room for decreasing their ecological footprint, because chemicals are used in just about every product they receive much attention for being a pollutant. Not only is the industry concerned about pollution, but also about creating a safer environment for its employees and surrounding community, which implies using less hazardous materials. Naturally, if the materials are less hazardous for us, it should be less hazardous for the environment as well. Regardless of the objectives or reasons, Jenk, Agterberg, and Droescher (2004) demonstrate that the industry is becoming more ecological.

As of 1998, Miller provided a study that showed 90 percent of US manufacturers incorporate environmental strategies and Sarkis (2001) expects "that this growth in corporate environmental consciousness will remain". Sarkis (2001) expects that during the 70's, corporations would comply at the minimum level required by regulators. However, as we enter the new era, corporations are going above and beyond minimum regulations in order to gain a competitive advantage (Stead and Stead, 1995). As is the main topic of this paper, the hope is that firms will gain above average profits by being more environmentally conscious while conserving the environment for future generations. However, as Walley and Whitehead (1994) point out "it's not easy being green". Furthermore, Sarkis (2002) stated there is an increasing skepticism of environmental business practices as the process becomes innately more difficult. Evaluating all components of green practices, we see that it involves engineers, accountants, multi-levels of management, external stakeholders, and others in order to accomplish a strategic goal that benefits both the internal players and the external.

While the process is not considered to be easy, the convergence of scholars and managers for the need of environmental protectionism is somewhat encouraging. With scholars such as Shrivastava (1995) calling for an ecocentric management theory where entire production systems incorporate environmental practices, managers increase financial reporting of environmental practices and create board positions for environmental specialists (Sarkis, 2001) all signs point towards a greener future. But the question still remains, who takes responsibility and how do we accomplish this greener future. According to Graedel and Allenby (1995), when our Environmental Impact is measured as the product of Population, Affluence, and Technology, and it is assumed that Population and Affluence are highly unstable. Therefore, it becomes the responsibility of the manufacturer to improve the Technology.

First, we must identify what this technology and manufacturer is in relation to the environment. Sarkis (2001) identifies that manufacturer's and their operations will fall under the scrutiny of industrial ecosystems. These industrial ecosystems "view the industrial world as a natural system—a part of the local ecosystems and the global biosphere. Industrial ecology offers a fundamental understanding of the value of modeling the industrial system on ecosystems to achieve sustainable environmental performance" (Lowe, 1990). Furthermore, there are three levels of industrial ecosystems. The first is an open system where unlimited materials flow into the manufacturing process and unlimited materials flow out. While this form of manufacturing may have existed in the past, it is becoming abundantly clear that we can no longer rely on unlimited resources.

Another form is an entirely closed system where there is no energy or material waste and where all inputs will be perfectly reused. While ideal, this process is highly unlikely. The goal is to move from the perfectly open system towards a closed system in a "quasi-cyclic materials flow ecosystem" (Sarkis, 2001) as will be discussed in the following paragraphs.

In order to attain this quasi-cyclic ecosystem, companies must evaluate their supply chain and adopt a framework that uses alternatives. In doing so, firms will improve their Technology, eventually reducing the Environmental Impact. However, given the multiple factors involved in adopting alternatives and new practices, there must be a framework to help the firm decide what practices to integrate into their supply chain. Sarkis (2001) argues that Technology includes "process, product, and practice strategy issues".

The product strategies is most closely linked with the life cycle of the product. The first phase of the product life cycle, is where firms develop the product for the customers. In developing the product, firms should initially evaluate the materials that go into the product. Not only should the materials be as renewable and non-hazardous as possible, but also the production of the product should be able to harness environmentally conscientious processes. The product should minimize maintenance that drains natural resources or contribute to hazardous and non-hazardous waste during its growth phase. During the maturity phase of the product, the product should avoid requiring large investments, thus new inputs and waste, to make small improvements as Hart and Milstein (1999) suggest it would. Ideally, when the product has reached the end of its life cycle, the product should be able to reinserted into the manufacturing process as useable materials rather than going to waste. "This concept also implies that the designers, and those central to its development from a supply chain perspective, are responsible for the product and its materials over the life of the product" (Sarkis, 2001).

While the argument for greening of a product throughout its lifecycle is logical, the implication is that the entire process—supply chain— must be improved. Beginning at the in-process stages of production, firms procure raw materials for production. Firms must evaluate whether these materials are reusable, renewable, or even safely disposable. Furthermore, in order to guarantee the environmental quality of the raw materials, Sarkis (2002) notes that the firm will likely choose suppliers who have certification guaranteeing they are less environmentally risky. Once the firm procures materials and begins production, technologies should improve efficiency by taking the most advantage of given materials and reducing waste. Florida (1996) argues that it is this stage where environmental innovations are most significant because the process is internal and will benefit the firm the most. While competitors could procure raw materials from similar suppliers, use similar distribution systems, etc., it is this internal production phase which gives the firm the competitive advantage. Once produced, the product must find its way to the customer. Hence, firms must develop a distribution system that reduces environmental impact through improvements in their "distribution outlet locations, mode of transportation to be used, control systems, and just-in-time policies" (Sarkis, 2002). The challenge is to identify how to meet customer needs whilst greening the distribution process within the realms of financial constraints.

While the life cycle and in-process aspects are crucial for greening the firm, the process does not end once the consumer has the product. Rather, reverse logistics is an often overlooked, “least developed and studied operational function” (Sarkis, 2002). Firms must answer to how their products meet their end and are disposed of once the product’s useful life has expired. Rather than simply disposing and wasting the product, Sarkis offers end-of-pipe solutions. Products can be reused, remanufactured and recycled by being re-inserted into the production process mentioned above. For example, Apple will often ‘reuse’ their products by refurbishing the product and re-selling them ‘like new’. This essentially eliminates the need for new inputs of raw materials and waste generated in the production phases, allowing the firm to simply reassemble the product. ‘Remanufacturing’ a product will “require some disassembly and replacement of parts or components around a core” (Sarkis, 2002) without using many new materials. When a firm can ‘recycle’ their product, it requires that the product be stripped to its base components and materials are made to be as similar to raw materials as possible, which can then be inputted again into the production process. While many of these solutions will exist, the firm must first analyze whether or not it makes business sense. Does it cost too much, take too much time, reduce the quality of their products, and is the company flexible enough to handle such processes (Sarkis, 2002).

At the beginning stages of product life cycle and process inputs are the selection of materials. As would be expected, selecting materials involves selecting suppliers. Manufacturers have multiple criteria to select manufacturers from including suppliers with ISO 14000 (environmentally certified) and ISO 9000 (quality certified) certified suppliers, renewability, disposability, and many other factors that will affect the entire process. However, this comes at a higher cost that directly contradicts the neo-classical economic model of maximizing profits (Blum-Kusterer and Hussain, 2001). Regardless, Sarkis and Talluri (2002) state that "buyer-supplier relationships based solely on price are no longer acceptable […] for organizations that wish to practice the latest innovations in supply chain management". This is to say that those corporations that strive to reduce their Environmental Impact through the improvement in Technology may not be able to simply abide by neo-classical economic models in selecting suppliers.

Therefore, organizations must use other tools to select their suppliers. Adopting Saaty's (1980) Analytical Hierarchy Process (AHP) is no longer sufficient according to Sarkis and Talluri (2002) because it only assumes simple and non-interactive criteria. For example, when scoring a supplier using AHP for renewability, durability, and cost, AHP ignores that requiring a certain level of cost and durability may impact the renewability of a resource. Saaty (1996) himself saw the limitations and created a new Analytical Network Process (ANP) tool to help find the appropriate supplier for manufacturers. Rather than simply creating a hierarchy of requirements, being a network of decisions, the ANP allows for multiple criteria in interact with one another.

The ANP not only allows for interaction of decisions among other unrelated criteria, but also allows for inter-related decision making. For example, on the "Planning Horizon", the firm may be strategizing long-term decisions while certain short-term barriers could pose a difficulty (Sarkis and Talluri, 2002). The firm will have to determine how significant short term cost of switching over to a new supplier will be in comparison to the long-term objective of having renewable raw materials. A second factor, "Strategic Performance Metrics" evaluate suppliers based on cost, quality, time, and flexibility. Manufacturers should evaluate for example how the cost will affect corporate cost reduction activities, quality affects corporate quality philosophy, time affects product development time, and flexibility with product volume variations. Because this second stage directly affects the operational process (Sarkis and Talluri, 2002), and the objective of the operational process is to a) reduce in-process waste and b) improve end-of-pipe solutions, firms must stress this significantly. The third ANP criteria relates to how the supplier fits in with the organization's culture, technology, and relationships. After determining all criteria, the manufacturer can then include their "Supplier Set" and find the best match. If we can assume that Sarkis and Talluri (2002) results are of any indication that ANP works, this could be a tool incorporated into the building blocks of product development and improved processes, which will ultimately lead towards reducing the firms Environmental Impact.

The process improvements for environmental friendliness call for drastic improvements across the board, which require practices "supported by organizational mechanisms" (Sarkis, 2001). Just because firms have the technology to reduce waste, without solid corporate policies, there is nothing to hold employees accountable for. Rather than having one environmental officer overseeing all operations, employees should be educated and actively participate in environmental efficiency mechanisms. Corporate benchmarks where all employees work towards along with performance measurement mechanisms to evaluate the product and process cannot be neglected. The bottom line is that without corporate governance, these changes will not be affective.

While it could be argued that these changes are costly and will affect the bottom line of the company, Sarkis (2001) argues that this fits hand-in-hand with

Total Quality Management. This is to say that many qualities of TQM overlap with that of environmental protectionism. For example, reducing waste, improving Just in Time delivery, and the "ultimate goal of zero defects fits well with the concepts of zero emissions" (Sarkis, 2001). Furthermore, Sarkis notes that ISO 14000 (environmental certification) standards have adopted Deming's Plan, Do, Check, Act originally developed for TQM. These two practices overlap so smoothly that ISP 9000 (quality certification) certified firms find it easier to implement ISO 14000 standards "with little extra cost and effort" (Sarkis, 2002). Therefore, it could be deduced that firms who strive for quality are but a sling shot away from being environmental as well and that they could essentially kill two birds with one stone.

Already, corporations are incorporating environmental concerns in their decision making process, incorporating stages of process, product, and technology (Shrivastava, 1994). It is suggested by Stead and Stead (1995) that corporations have strategies in dealing with environmental concerns that go beyond regulation in anticipation of gaining a competitive advantage. On the other hand, Cordeiro and Sarkis (1997) argue that these costs ignore the 'bottom line' for stakeholders of corporations. Furthermore, because results of previous studies show that the impact of environmental investments on financial performance will vary, Coredeiro and Sarkis (1997) attempt to innovate a tool that looks beyond the stock market and other traditional financial performance measures.

This is not an easy mechanism to develop considering the ever-changing demand for environmental activism. Freeman (1994) suggests that while the firm was traditionally responsible to government regulation bodies in a reactive strategy, the costs of environmental control has been driven sky high as civil penalties, public disclosure requirements, increased responsibility demanded of the corporation, and increasing regulatory expenses make the job ever more difficult. Therefore, rather than treating environmental costs as a burden, corporations have taken advantage of the changes by incorporating these environmental operations into their competitive advantage strategies (Stead and Stead, 1995). Considering that all other industry players must meet the same requirements, it would only seem logical that incumbents with the capacity to do so would invest more in order to gain an upper hand over their competitors. With 91 percent of executives acknowledging that corporate image is influenced by how they treat the environment (Sheridan, 1992) and government incentives such as tax-breaks for preventative mechanisms (Drobny, 1994), it only further adds to the argument that corporations should actively make environmentally friendly investments and decisions.

If there is any doubt remaining as to whether corporations should in fact develop higher standards of environmentalism, we can review Guimaraes and Liska's "Exploring the Business Benefits of Environmental Stewardship" (1995). They demonstrate that non-financial performances such as human resources where employees demonstrate higher morale and involvement, general loyalty through customer, employee, and investor retention/attraction, and overall corporate efficiency with reduced waste, insurance, and lawsuits. Seemingly, there is no reason why corporations should not and would not invest in the environment. However, while above arguments lean towards competitive advantage of customers, employees, and funds, Cordeiro and Sarkis (1997) cite studies that show "environmental expenditures will far exceed sales growth [… and] that many executives expect net *costs* from corporate environmentalism".

Furthermore, while there is an "abundant *anecdotal* evidence on the financial impact of environmentally-conscious business practices" (Cordeiro and Sarkis, 1997), their review suggests that the bottom line does not reflect the positivity of such anecdotal evidence. They are not alone in this cautious approach as other scholars have found little correlation between pollution performance and financial performance (Ingram and Frazier, 1980; Chen and Metcalf, 1980; Freedman and Jaggi, 1982). In the mid-90's, however, the tone of scholarly articles changed as Hart and Ahuja (1994) demonstrated that there is in fact some positive correlation between environmental and financial performance. They are not alone as Diltz (1995) and Cormier (1993) identified positive stock market returns for environmentally conscious corporations and negative market valuation for companies with poor environmental performance, respectively. However, Cordeiro and Sarkis (1997) conclude that while long-term performance mechanisms seem "promising", companies should "anticipate negative *short-term* (one to five years) impacts of corporate environmentalism on financial performance". Considering that many managers are rewarded based on short-term performance, what logic exists for those managers to give up those rewards if long-term reward mechanisms are not in place?

Under their own hypothesis that environmental investments will negatively impact short-term financial performance, Cordeiro and Sarkis (1997) argue that traditional accounting performance measures such as returns on sales, assets, and equity (ROS, ROA, and ROE) or EPS (earnings per share) are insufficient. These measurements are "deficient because they are unidimensional and thus unsuited to fully assessing firms' strategic outcomes and performance [… and] are retrospective and in that they reflect only past performance and not future performance" (Cordeiro and Sarkis, 1997). While there are other arguments for *not* using accounting performance measures such as manipulating accounting within the frameworks of GAAP, they suggest that stock market performance would better suit evaluating the environmental and financial performances. On the other hand, they cite that information asymmetry where management has privileged information and economic 'noise' will skew the findings.

In order to reduce such 'noise' and economic influences, this pair suggests that industry security analysts can provide more accurate analysis through ongoing monitoring. Furthermore, analysts' assessments of industries are "prospective", where they predict the future earnings, as opposed to traditional accounting mechanisms, which are retrospective and evaluate the past. Therefore, in order to create what they argue as the most accurate form of financial measures, Cordeiro and Sarkis used one-year earnings per share and five-year earnings per share given by industry analysts. Earnings per share was chosen as the variable because this affects both individual investors and managers, thus being the best variable to measure the bottom line performance of a firm. They also included firm size and financial leverage as control mechanisms because these factors may influence performance and will determine the amount of stock financing required for a company (and hence the earnings per share). As for their other variable, environmental proactivism was measured as being the total waste generated, less the total pollution releases, divided by sales in order to standardize results. Subtracting the total releases from the total generation leaves us with total recovery, recycling, and treatment, which Cordeiro and Sarkis consider to be the definition of environmental proactivism. Through multiple regression models, they find that financial performance as measured by industry analysts' earnings per share and environmental proactivism "were significantly *negatively* related" for both one year and five year estimates.

Rather than dismissing the validity and significance of environmental proactivism, Crodeiro and Sarkis "counsel corporations to be patient in waiting for longer-term payoffs" and to treat environmental proactivism with the same attitude as Research and Development or Total Quality Management where short term losses are generally accepted in exchange for the long term payout. Even though these results may deter managers from making environmentally proactive decisions, these researchers advocate that decision makers educate their stakeholders about the benefits of environmental management instead of favoring short-term results, which inevitably hinder the adaptation of strategic long-term policies.

Scholars find that environmental innovations should improve financial performance, yet there are few frameworks that empirically prove the link exists. I attempt to fill this void and demonstrate that financial performance is correlated to environmental innovations. Going one step further, I hope to support existing qualitative literature by quantitatively proving that environmental innovation activities in fact drive financial performance.

Methodology

Theoretical Framework

There have been multiple scholars who claim that there is no measurable material relation between corporate social responsibility and financial performance (Aupperle et al. 1985). However, as CSR became quantified with reports such as Responsible Care guided by accounting principles Cortez (2010) suggest that links between financial and environmental performance are beginning to emerge. Before answering what the relation between environmental innovations and financial performance is or even if such a relationship exists, we should examine multiple theoretical frameworks.

Legitimacy and Stakeholder Theory

Under DiMaggio and Powell's (1983) institutional theory, firms will adopt practices in order to gain legitimacy through normative, coercive, or mimetic pressures. This legitimacy defined by Suchman (1995) as a "generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" would suggest that the more 'legitimate' a firm is, the better their financial performance. Furthermore, Davis's (1973) Iron Law of Responsibility suggest that if firms are not socially responsible, society will strip them of their ability to conduct business.

While legitimacy theory is significant, we should examine with whom the relationship exists. DiMaggio and Powell's (1983) normative pressure for legitimacy states that stakeholders with a specific interest in the firm will exert the pressure for legitimacy on the firm. Similarly described by another scholar, Freeman's (1984) stakeholder theory defined those participants who could either benefit or be harmed by the firms actions will ask for legitimacy. Furthermore, a study by Stanwick &Stanwick (2006) determined that Japanese firms are aware of their various stakeholders and are increasingly addressing them specifically in their environmental reports. Addressing normative pressures under institutional theory Zhu et al (2010) states "without a good environmental image and social acceptance, those large companies will lose market share on a global level".

Not only do stockholders and end-users determine the legitimacy of the firm, rather it can be various other stakeholders such as buyers and suppliers. Considered coercive pressure under institutional theory, legitimacy in the eyes of stakeholders can go as far as a purchaser acting as a regulator to their suppliers. While purchasers may not have legal power to enforce regulations, they do so as Zhu et al (2010) found through green purchasing. In other words, purchasers threaten suppliers with termination if the products at hand are not up to a minimum standard. According to Rivera (2004) government agencies are powerful coercive forces implementing stringent environmental laws. Because we are examining the Japanese chemical industry who act as suppliers to other end-user manufacturers, Japan's 2000 Law on Promoting Green Purchasing is a coercive force requiring the industry to maintain legitimacy in the eyes of significant buyer stakeholders such as the large automotive and electronic manufacturers. Furthermore, Zhu et al (2010) find that the implementation of such green supply chain management practices is perpetual in essence: without internal green practices, firms cannot extend the same requirements to their suppliers. And because the chemical industry acts as suppliers to other industries, they are under constant coercive pressures subject to the environmental friendliness of multiple other industries.

Further evidence supports the existence of legitimacy theory considering that classical finances cannot explain the mechanism behind environmental innovations and financial performance. As Orlitzky (2005) points out, Responsible Care/CSR will not necessarily imply cost performance. A quick look at Japanese chemical industry's environmental report clearly supports this notion considering that firms spend more on the environment than they directly receive benefit of. Traditional finances encourage firms to review the cost-benefit relation. Because this traditional framework does not apply to the environmental pillar of CSR, where costs heavily outweigh benefits, there must be another force at hand: Legitimacy.

With corporate social responsibility traditionally addressing society and economy alone, firms introduced to the newer, third pillar of environmental concerns must then find a way to maintain legitimacy. With an increased public awareness of the environment and coercive pressures by external stakeholders, it would only be logical then that firms will participate in environmental performance. McGuire et al (1988) suggest that the intangible benefits of legitimacy will become tangible. Therefore, should the results of this study determine that environmental innovations positively affect financial performance, it could be interpreted that McGuire's intangible legitimacy in fact had tangible results for the Japanese chemical industry.

Resources Based View of the Firm

A resource-based view of environmental issues suggests that larger firms are more equipped to implement green practices (Barney, 2001). Interestingly, out of the 154 Tier 1 Tokyo Stock Exchange listed firms, only thirty-one had complete environmental data available since 2001. On the other hand, twelve of sixteen chemical firms listed on the more prestigious Nikkei 225 had comparable data available. Cortez (2010) further suggests "differences in firm performance are primarily the result of resource heterogeneity across firms". Teece (1986) found complementary assets allow firms to capture profits under the resource-based view. In an environmental context Christmann (2000) defined complementary assets as those that would allow firms in implement environmentally friendly practices. Cortez (2010) and Christmann (2000) both find that environmental innovations will range depending on the size of the firm as is suggested by the varying degree of environmental innovation.

There is support for the notion that the resource based view perspective will lead firms to improved financial performance as well. The source of improved financial performance could come from firms gaining competitive advantages and unique organizational capabilities through environmental innovations (Hart, 1995) Further scholars go so far as to argue that environmental innovations will lead to premium profits (Russo & Fouts, 1997). On the other hand, Hart & Milstein (2003) suggest that sustainability practices are a necessary evil in order to maintain legitimacy with regards to shareholder value and external stakeholders while ultimately reducing costs and risks. Should the outcome of this research determine that environmental innovations by firms within the chemical industry reduce cost (cost of sales) and risk (long-term debt) while improving profits (net income) and shareholder value (owner's equity), it would further validate the above scholar's findings. Such results would provide evidence towards the argument that corporate social responsibility improved financial performance.

Slack Availability of Resources Theory

While the RBV suggests that CSR creates financial performance, we should not ignore that existing financial performance may facilitate environmental innovations. This is to say that Responsible Care would occur due to previous financial performances (Ullmann, 1985). If firms have phenomenal financial performances in the past, they will be able to absorb the burdening cost of environmental innovations. Under the slack availability theory, if a firm does not have the resources, they may not be bothered to take environmental responsibility seriously. The logic is sound; firms cannot spend money they do not have and will never recover.

Because there are proponents of this theory, I find it necessary to test against environmental performance. Therefore, if the relation demonstrates that environmental performance is dependent on financial performance variables, we will observe a slack availability of resources for these variables rather than the RBV perspective that CSR creates financial performances. Orlitzky (2008) suggests that a third option is available citing that social and financial performance are "mutually reinforcing" "concurrent bi-directional" and engage in "virtuous cycles". E.g. Financial performance such as revenues will allow for environmental innovations, which will then lead back to revenues. Based on the studies of aforementioned scholars, I look to validate sales, net income, liquidity, assets, liabilities, long term debt, and equity.

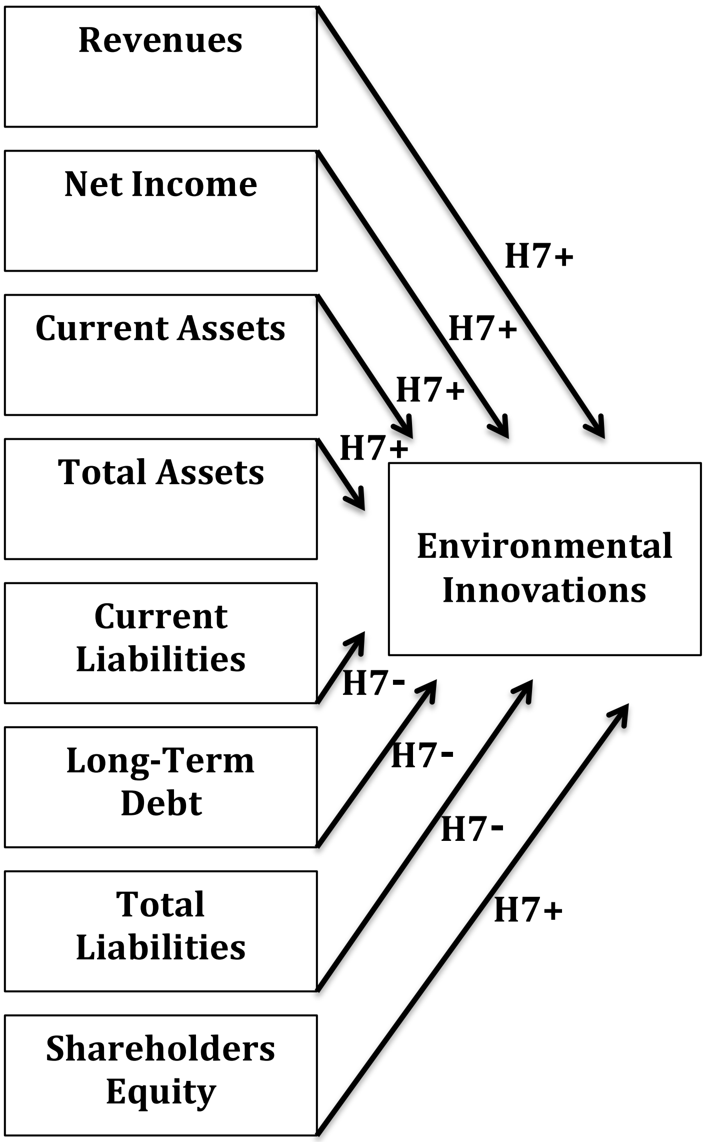
Conceptual Framework

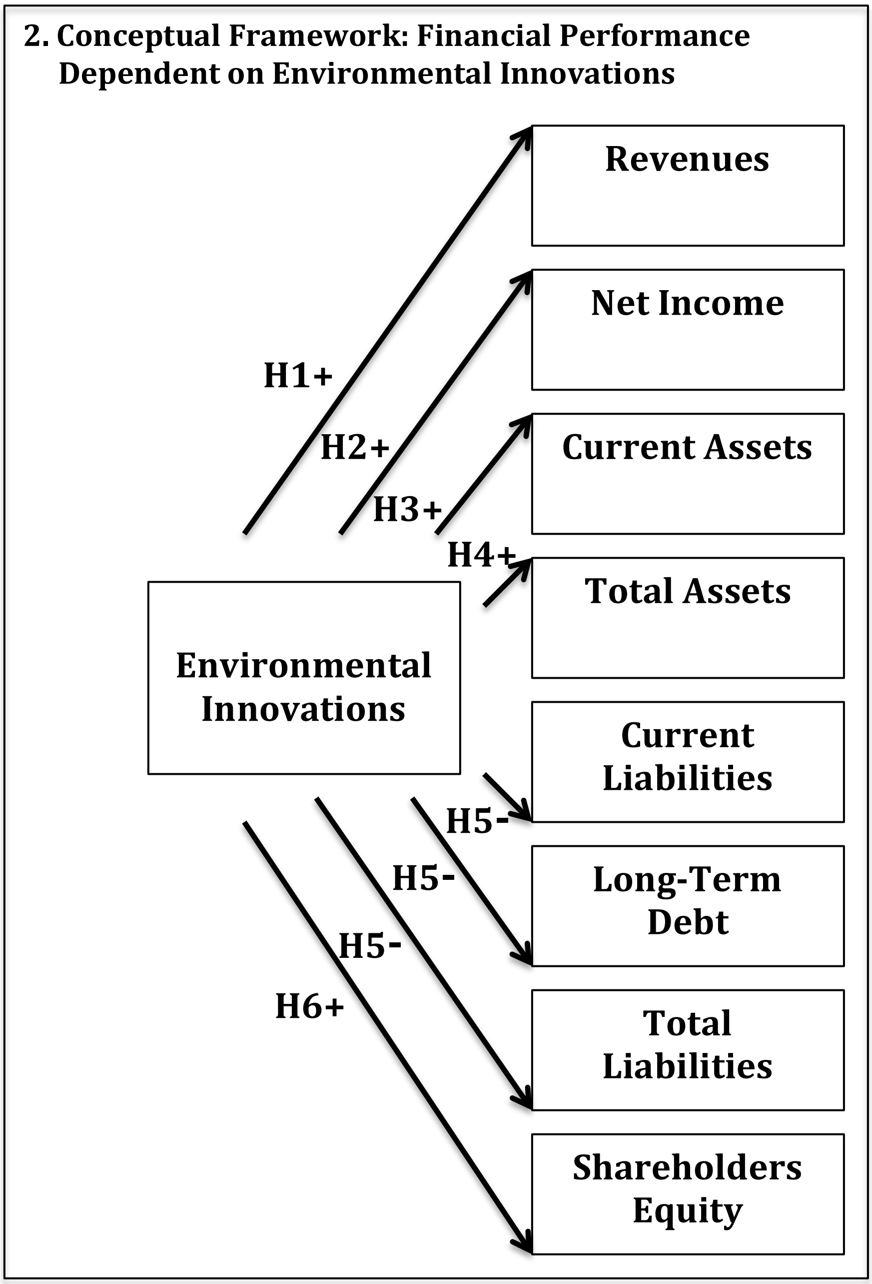
Regardless of the motivations for firms to engage in environmental innovations, there is enough literature to suggest some form of relationship between environmental innovations and financial performance should exist. Financial performance constructs are compiled of data published annually by the publicly listed firms. For the purpose of this study, environmental costs and investments by chemical firms found on publicly available Responsible Care, Corporate Social Responsibility or Corporate Social Performance reports are the second construct. Although literature would suggest that firms engage in such non-financially motivated activities due in order to establish legitimacy and please stakeholders, this paper aims to provide evidence that compliments existing stakeholder theories by testing for a relation between aforementioned variables.

Because of stringent compliancy laws in Japan, the first assumption is that environmental innovations are independent of financial performance. That is to say that financial performance is dependent on environmental innovations because without such environmental innovations the firm would not be able to efficiently operate and thus lose their competitive edge. An admitted shortcoming of this research would be that I must hold all industry factors constant. By limiting available influences of financial performance, it is expected that environmental innovations will positively impact financial performance according to the resource based view.

The relation, as suggested by the slack availability of resources theory, could also be reversed. That is to say that financial performance of the firm in prior years gives them the ability be environmental. Although environmental innovations have a minimum required level as established by the Ministry of Environment, the firm is subject to compliancy regulations because products are manufactured that establish the business. Without the product the firm would have no revenues and therefore not be subject to regulations. Therefore, environmental investments are dependent on financial performance of the firm.

1. Conceptual Framework: Environmental Innovations Dependent on Financial Performance





Operational Framework

Because academics say that quantifying environmental performance is an innately difficult task, we must ask ourselves whether or not there is in fact a link to financial performance. Under the resource-based view, however, investments, human and capital assets, capabilities, and other various intangible and tangible resources can be linked to financial performance. Because this paper examines the environmental aspect of social responsibility, we must next identify what constitutes as environmental innovations. For this, I look to the Ministry of Environment's guides on environmental accounting, which states the following:

> Environmental accounting aims at achieving sustainable development, maintaining a favorable relationship with the community, and pursuing effective and efficient environmental conservation activities. These accounting procedures allow a company to identify the costs of environmental conservation during the normal course of business, identify the benefits gained from such activities, provide the best possible means of quantitative measurement and support the communication of its results.
>
> **(MOE, 2001)**

According to scholars (Cortez, 2010), the environmental costs are the net of environmental investments and environmental expenses necessary to conserve or reduce the potentially harmful impact on the environment. Investments, much like in traditional accounting, are capital expenditures that firms, or in this case the environment, realize the benefit of over the course of fluctuating years, depreciated over this period. Environmental expenses are costs required to maintain, finance, acquire services, etc. the environment over the current period. The investments and expenses are then typically classified as business area costs, upstream/downstream costs, management costs, research and development costs, social activity costs, and environmental damage costs. Some firms will break these six categories into smaller segments, however, the significance of these categorizations is that Russo & Fouts' (1997) resource based view criteria of human assets, organizational capabilities and intangible research and development costs are included in the environmental costing. Therefore, environmental accounting defined by the Ministry of Environment and practiced by chemical firms can be quantified as a measurable variable under the resource based view theories.

Research Design

This study applies the descriptive-exploratory case study design as outlined by Yin (2009). Under this case study methodology, I review an existing body of literature that theorizes an existing relation between the impact of financial performance and environmental innovations. Furthermore, because it is presupposed that the chemical industry is at the foot of the supply chain, this particular industry is significant in promoting the environment and sustainability. In choosing an industry acting as a supplier to end-user manufacturers, the applicability of this study could contribute to other scholars intending to replicate theories and hypotheses presented when reviewing other supplier industries.

While previous studies signal identifying and quantifying environmental innovation as a problem, Japan's strict environmental laws promoting environmental reporting allow for uniform measurements across industries. Because environmental innovation, both proactive and reactive, will have an identified cost I identify environmental innovation as the net environmental cost/innovations of the firm. Such environmental innovations were gathered from the Sustainability, Responsible Care, CSR, CSP, etc. reports publicly made available by all sample firms. Financial information was selected from database archives also listing the firm's publically available financial performance. Firms selected had ten years, beginning in 2001, of environmental and financial performance data publicly available.

Because financial performance is subject to not only other corporate social performance variables under legitimacy and stakeholder theory but also to the dynamism and interaction of multiple industries, consumer behavior, regulations and countless other variables, further analysis is required. Therefore, through statistical generalization of a particular CSP variable justified by prior theorizations, the case study design according to Yin (2009) appropriately fits this research.

Population and Sampling Design

While the initial sample was to be selected from the Nikkei 225, selecting firms from this prestigious category was found to have limited applicability. In other words, for other scholars to recreate and apply these findings to other industries, results from top tier firms would not apply to the industry as a whole. Therefore, firms categorized as part of the "chemical" industry on the Tokyo Stock Exchange were selected for this study. In order to create a balanced and statistically sufficient data set, firms with ten years of environmental accounting following the Ministry of Environment's guidelines and financial performance data publicly available since 2001 were selected.

Furthermore, firms whose core revenues were generated from end user product or services were eliminated. Through this purposive clustered sample design, the outcomes of this research will be valid for industry player's part of the supply chain to end-user manufacturers. Firms fitting the criteria are shown below:

3. Sample Firms	
AICA KOGYO CO LTD	SEKISUI CHEMICAL CO LTD
ASAHI KASEI CORP	SEKISUI JUSHI CO LTD
ASAHI ORGANIC CHEMICALS IND	SHIN-ETSU CHEMICAL CO LTD
CENTRAL GLASS CO LTD	SHIN-ETSU POLYMER CO LTD
DAICEL CORP	SHOWA DENKO KK
DIC CORPORATION	SUMITOMO CHEMICAL CO LTD
HITACHI CHEMICAL CO LTD	TAIYO NIPPON SANSO CORP
HOKKO CHEMICAL INDUSTRY CO	TOAGOSEI CO LTD
KANSAI PAINT CO LTD	TOKUYAMA CORP
KURARAY CO LTD	TOSOH CORP
KUREHA CORP	TOYO INK SC HOLDINGS CO LTD
MITSUBISHI CHEMICAL HLDGS CO	UBE INDUSTRIES LTD
MITSUI CHEMICALS INC	KANEKA CORP
NIPPON PAINT CO LTD	NIPPON KAYAKU CO LTD
NOF CORP	NIPPON SHOKUBAI CO LTD
SANYO CHEMICAL INDS LTD	

Measurement and Research Procedures

Variables used in this research were found in one of two methods. Accurate and sufficient financial data for all 154 Tokyo Stock Exchange listed chemical industries were found on COMPUSTAT. Selected variables included revenues, cost of sales, net income, current assets, total assets, current liabilities, long-term debt, total liabilities, and owner's equity.

Environmental accounting information was found in published sustainability reports of chemical firms. Seventy-two chemical firms were found to have environmental accounting included in their sustainability reports at least since the turn of the century. However, only thirty-one of these firms had complete environmental accounting publicly available for the entirety of 2001 to 2010. It is crucial for users of data to be aware that environmental accounting is not yet a component of generally accepted accounting principles (Saudagaran

2004). Rather, these adjusted environmental accounting estimates originate from GAAP compliant financial performance variables guided by the MOE which Japanese firms in order reconcile the differences in various nation's GAAP (Cortez, 2010). Because firms are at liberty to capitalize or expense these accounts, in order to create a certain level of consistency, the total of capitalized and expense accounts are considered statistically relevant for the purpose of this study. Lastly, there is a time lag between environmental report publications and financial report publications. For example, firms may publish the environmental report as the "2010" report, however, the environmental accounting information included within the report refers to the 2009 year. Therefore, data collected from the various environmental reports are diligently aligned with that of the corresponding financial period.

With data collected from annual reports on COMPUSTAT and available sustainability reports, the next step is to empirically analyze the information. Panel regression was used in order to determine two directions of the relationship. The first relation tested was to determine whether environmental innovations influenced financial performance, testing the resource based view perspective. The second relation tested determined whether financial performances influenced environmental innovations, testing the slack availability of resources theory. Both tests are performed on the industry as a whole. Lastly, a Granger causality test was performed to test both directions of aforementioned relations. In doing so, we can further strengthen the argument for directionality of the results while simultaneously verifying whether the virtuous cycle is present. The Granger causality test was performed on each individual firm within the industry. All data was tested using Stata 12.0 and interpreted considering the theoretical framework presented.

Assumptions of the Study

1. Unlike the U.S. GAAP where R&D must be expensed, Japanese GAAP allows the firm to either expense or capitalize R&D. Therefore, even under the Ministry of Environment's guidelines for environmental accounting, there may be an uneven distribution of environmental innovation efforts depending on if the firm capitalized or expensed these efforts. Therefore, for reasons of simplicity and conformity, this research examines environmental costs net of capital and expense accounts.
2. Because firms publish sustainability reports at varying periods and there may be a time lag, applying the "2010" environmental report to 2010 financial reports may not be accurate. Therefore, regardless of when and under what title the sustainability reports are published, environmental accounting information and financial performance variables are matched to cover identical periods.
3. Within the chemical industry, there are firms manufacturing end-user products and offering end-user services. For example Shiseido's cosmetics, Fujifilm's cameras and digital services, and Lion's shampoos and soaps make of the bulk of such firms' revenues. However, such firms are purposively eliminated in order to render results for firms involved primarily in the supply chain of end user product manufacturing firms.
4. There are a multitude of variables that could influence the statistical testing of the relationships hypothesized. Such influences as the economic

crisis of 2008, changes in corporate governance, mergers and acquisitions within the industry, and competitive dynamics are just a few possible influences. Therefore, for the sake of simplicity, all variables outside of the scope of this study are held constant, yet are admittedly a methodological limitation of this research.

Research Hypothesis

By adopting perspectives of multiple scholars that there is in fact a link between financial and environmental performance, quantifying environmental performance as a measurable variable under Russo & Fouts' (1997) criteria met by the Ministry of Environment's guidelines on environmental accounting and upheld by chemical firms I can begin to formulate hypotheses.

Based on stakeholder theory where firms engage in environmental investments in order to create legitimacy and maintain branding, environmental investments have a positive impact on financial performance. More specifically, when firms create legitimacy and reputation, holding all other influences constant, they will increase their revenue generation. Therefore, holding all else equal, I hypothesize that:

Hypothesis 1 (H1): Environmental innovations positively influence revenue generation (total revenues) for Japanese chemical companies.

Sustainability is not only about an ecological end product but rather about the entire manufacturing process. In greening of the firm according to Sarkis (2001), firms will streamline their processes. In streamlining their processes, firms improve their efficiency which in turn reduce operating costs. Also, as Zhu et al. (2010) finds, green supply chain management involves a high level of recycle, reuse, and reduction. These factors can reduce the costs of recall, disposal of potentially harmful chemicals, lawsuits, etc. which in turn increase profitability. This assertion is further supported by Klassen & Mcluaghlin (1996) who find that profitability can improve with cost reduction investments in environmental innovations. Therefore, holding all else equal, I hypothesize that:

Hypothesis 2 (H2): Environmental innovations positively influence the profitability (net income) of Japanese chemical companies.

Because profitability can also be measured in terms of liquidity, I further hypothesize that:

Hypothesis 3 (H3): Environmental innovations positively influence the liquidity (current assets) of Japanese chemical companies.

A firm is expected to grow alongside years of sales growth. The company will expand manufacturing facilities, office spaces for new employees, require property to park their vehicles, expand product lines that require more research and development facilities; so long as firms grow they will require such new assets. Furthermore Christmann (2000) suggested that environmental management requires newer assets. Conversely, Cochran & Wood (1984) find that firms with older assets have poor corporate social responsibility ratings. Because environmental performance requires assets, which signify firm growth, in order to maintain a competitive advantage, holding all else equal, I hypothesize that:

Hypothesis 4 (H4): Environmental innovations positively influence the size (assets) of Japanese chemical companies.

Referring once again to firms establishing legitimacy in order to appeal to stakeholders, the resource based view framework allows us to determine if shareholder value quantified by owner's equity is influenced by environmental innovations. If environmental innovations are in fact perceived by shareholders as a legitimacy creating activity, equity should then be improved. Furthermore, according to Shrivastava (1995) environmental innovations will reduce contingent liabilities. Because the balance between assets and liabilities and owners equity cannot be disrupted, if firms reduce such contingent liabilities, owner's equity must increase. Also, because liabilities are a form of accounting risk according to McGuire et al (1988), should contingent liabilities be reduced through environmental innovations, a firms accounting risk will also be reduced. Therefore, holding all else equal I hypothesize that:

Hypothesis 5 (H5): Environmental innovations positively influence shareholder value (owner's equity) of Japanese chemical companies.

Hypothesis 6 (H6): Environmental innovations negatively impact the accounting risk (long-term debt, current liabilities, and total liabilities) of Japanese chemical companies.

We cannot ignore existing literature asserting that environmental innovations occur because of existing financial performance. If a chemical company finds that a biodegradable product generates above average revenues due primarily to the ecological component of the product, they may engage in extraordinary environmental research and development of a new ecological product line. Such slack availability of resources theories supported by the likes of Ullmann (1985) and Orlitzky (2008) would suppose that revenue generation, firm size, shareholder value, long-term debt and other financial performance mechanisms determine the amount of environmental innovations a firm engages in. Therefore, holding all else constant I hypothesize that:

Hypothesis 7 (H7): Financial performance impacts the environmental innovations of Japanese chemical companies.

Literature asserts that suppliers are subject to the purchaser's green standards enacted by the Law on Promoting Green Purchasing (Zhu et al 2010). Because the scope of this study selects chemical firms who act primarily as suppliers to other end-user product manufacturers, we could further establish that link by comparing the financial performance of the chemical industry to that of their purchasers. For this purpose, I examine Japan's prominent automotive and electronic industries. However, because these two industries incorporate chemicals into each unit of their products, I compare the number of production units provide by Japan Automobile Manufacturers Association and the Japan Electronics and Information Technology Industries Association to the financial performance of the chemical industry. Therefore, in order to validate previous research that the chemical industries is a supplier influenced by other industries I hypothesize that

Hypothesis 8 (H8): Financial performance of the chemical industry is dependent on production units of the automotive and electronic industries.

Scope and Limitations

Because I am reviewing Japanese chemical companies, companies were selected from the Tokyo Stock Exchange under the chemical categorization. Firms were initially selected from Nikkei 225, however, because these firms are considered to be the top tier firms, it was soon determined that the results would not accurately depict the industry as a whole. Secondly, because this research is interested in greening of the supply chain, firms earning revenues primarily from end user products were eliminated. Eliminated firms under this criterion include but are not limited to Fujifilm, Shiseido, and Lion. The third criteria required firms to make environmental accounting publicly available from 2001 through 2010 per definition of the Ministry of Environment. The result of these criteria was thirty-one chemical manufacturers with revenues primarily originating from products sold to other manufacturers who would incorporate the chemicals into an end user product.

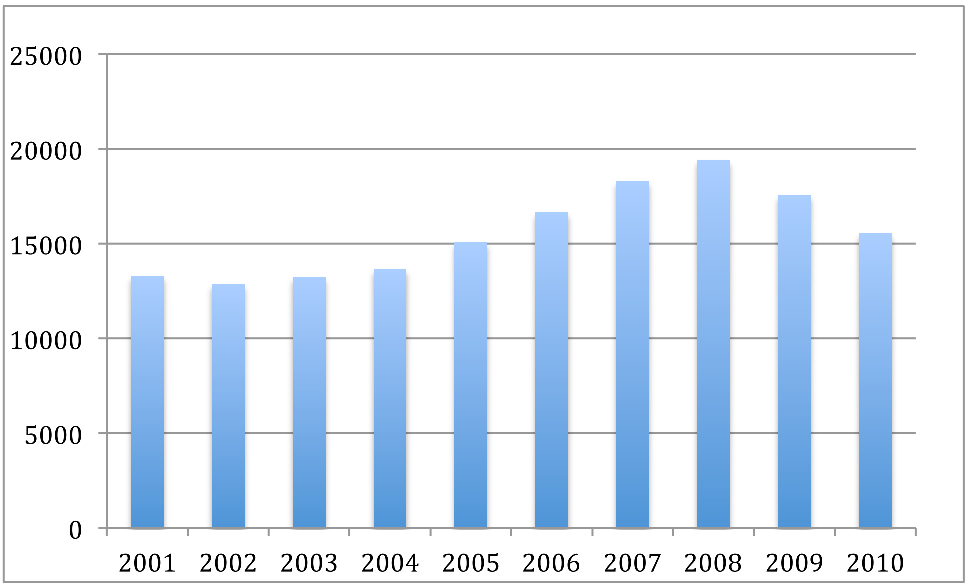
While the definition of environmental accounting has been made clear, one limitation of this research is that the environmental accounting variable may not capture the entire picture. Because environmental accounting is comprised of six different categories, firms may behave differently in each category and may even have different focus areas depending on the year. Furthermore, firms may elect to expense or capitalize costs within the confines of Japanese Generally Accepted Accounting Practices. While there is a possibility that certain expenses or capital expenditures in a specific category of environmental accounting will influence financial performance more than the other, in order to create common ground to run the experiments, the sum of all six categories and expense and capital costs are used.

Results and Discussion

Data Presentation and Descriptive Statistics

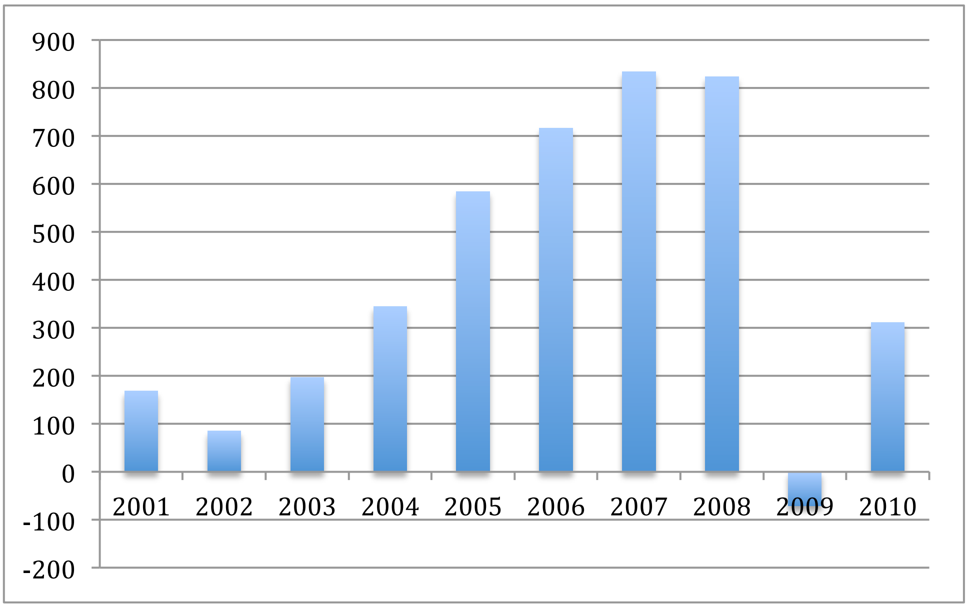
According to Cortez (2010), the automotive and electric industries of Japan have experienced declining profits due to the appreciation of the JPY during the global financial crisis. Considering that chemical firms, for the purpose of this study, are a component of such manufacturing industries, it could be expected that chemical firms are influenced by similar woes through ripples in the supply chain. The revenues of the thirty-one firms involved in this thesis peaked during 2008 and have yet to recover as of 2010, hovering at 2005 levels.

4. Total Revenues of Sample Firms (billions of JPY)



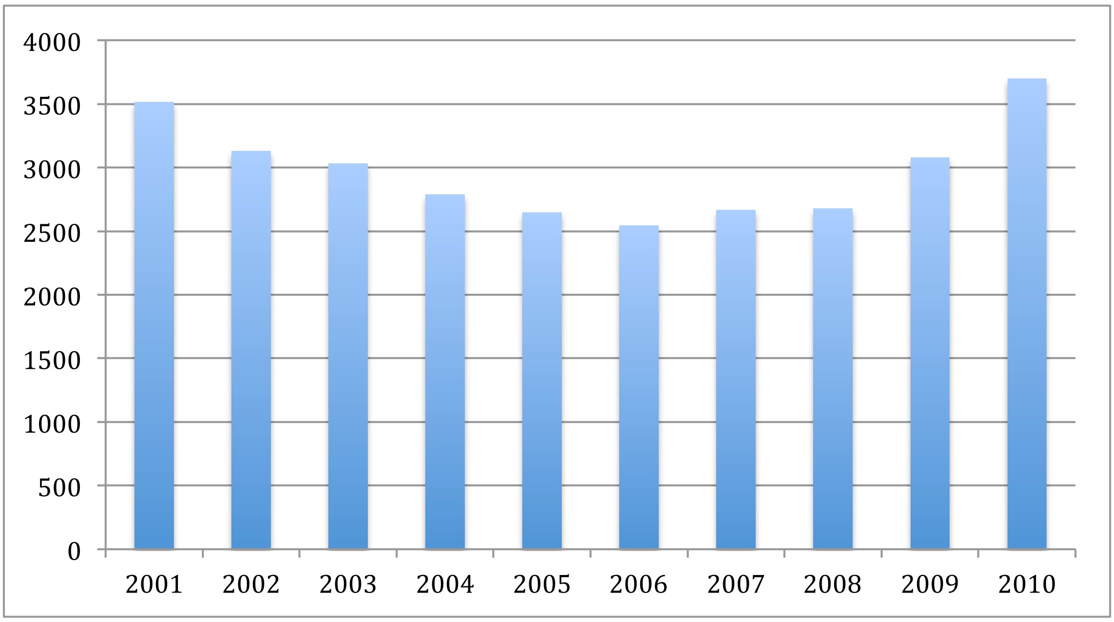
Net income of the sampled firms reveal a much more drastic image than their revenues would imply and demonstrate just how dynamic the chemical industry is. A year-by-year comparison of the chemical industry shows that their net income is much less stable than that of revenues. For example, in 2002, revenues drop a mere 4 percent and yet, net income was split in half. On the opposite extreme, revenues lost nearly 12 percent across 2009 and 2010, however net income recovered five fold going from negative to positive.

5. Total Net Income of Sample Firms (billions of JPY)



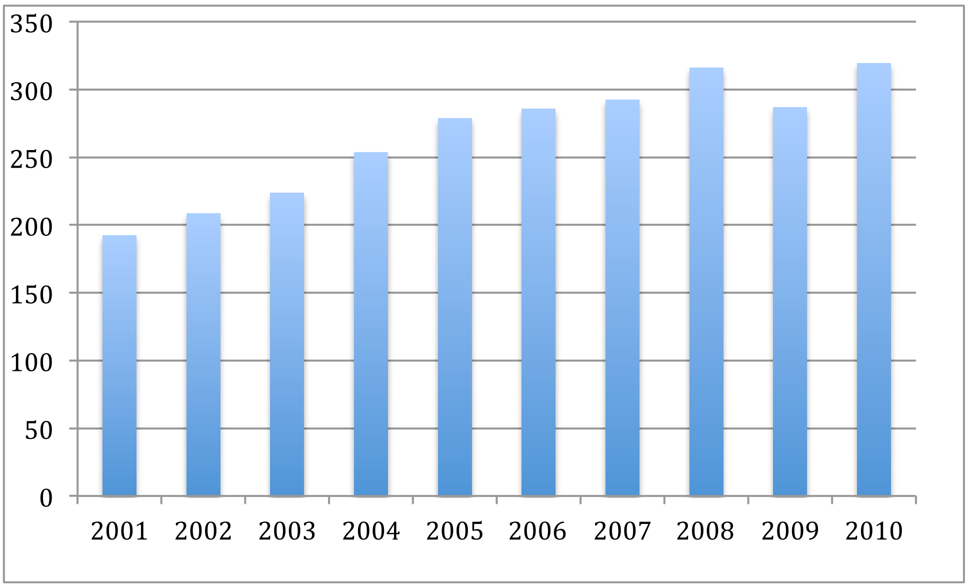
Under the slack availability of resources theory, the statistical results should determine that environmental innovation efforts be reduced since 2009 based on revenues yet increased if we consider net income. Similarly, in strictly adopting the resource based view perspective, one could argue that reduced environmental performances were the cause of reduced revenues and the reason for improved net income in 2010. It goes without saying, however, that this is not going to be the case considering that there are many variables involved in a dynamic industry. Rather than attempting to define absolutes where environmental innovations will cause a specific financial performance, the statistical analysis aims to empirically identify a pattern.

6. Total Debt of Firms Sampled (billions of JPY)



The sample firms steadily decreased their level of debt between 2001 and 2005. However, we can observe a rapid accumulation of debt over the 2009 and 2010 periods. Not coincidentally, firms experienced tremendous losses and have yet to recover net income to levels prior to the economic crisis. I would like to assert that the debt was incurred in order to cover the losses and cash flow strains the firms experienced over the crisis. Comparing the level of debt to the environmental innovations as shown in the chart below, they are clearly disproportionate. Under a slack availability of resource model, firms should have reduced their environmental innovation spending, especially if they were required to incur debt in order to pay for such operations. On the other hand, under the resource-based view, the firm's financial performance should have improved considering that their environmental innovations were never reduced. Yet, as this is not the case, I expect that the statistical analysis will not prove significant results, especially in the latter half of the decade.

7. Environmental Innovations of Sample Firms (billions of JPY)



Observing the environmental costs of sample firms shown above, I find even more muddled results. Environmental measures during 2002 were improved even though revenues and net income were reduced at varying degrees. Assuming a stakeholder theory where firms are attempting to gain legitimacy through CSP, we can explain why chemical firms would conduct environmental innovation in spite of poor financial performance. More support of legitimacy building activities could be found in that environmental innovations, with exception of 2009, never dipped below previous years levels and even recovered in 2010 to surpass 2008 levels regardless of the level of revenues or net income.

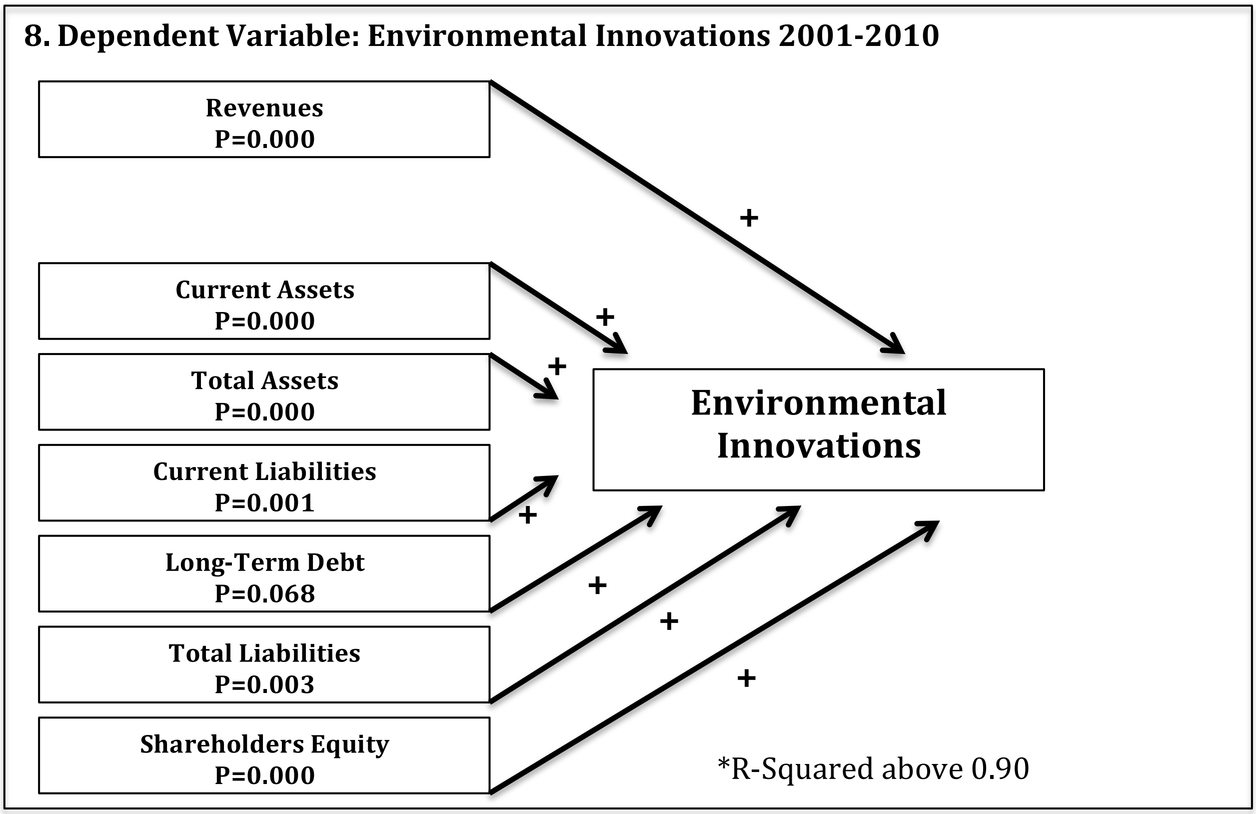
The conclusion here is that legitimacy and stakeholder theories, resourced-based view perspective, and slack availability of resource theories can be argued to describe the many observable phenomena when describing the relation between financial performance and environmental innovations. Furthermore, there are observable variables such as the global economic crisis and may even be unobservable influences such as changes in corporate governance. Therefore, it is necessary to statistically analyze the relation between environmental CSP and financial performance as will be done in further sections.

Statistical Analysis

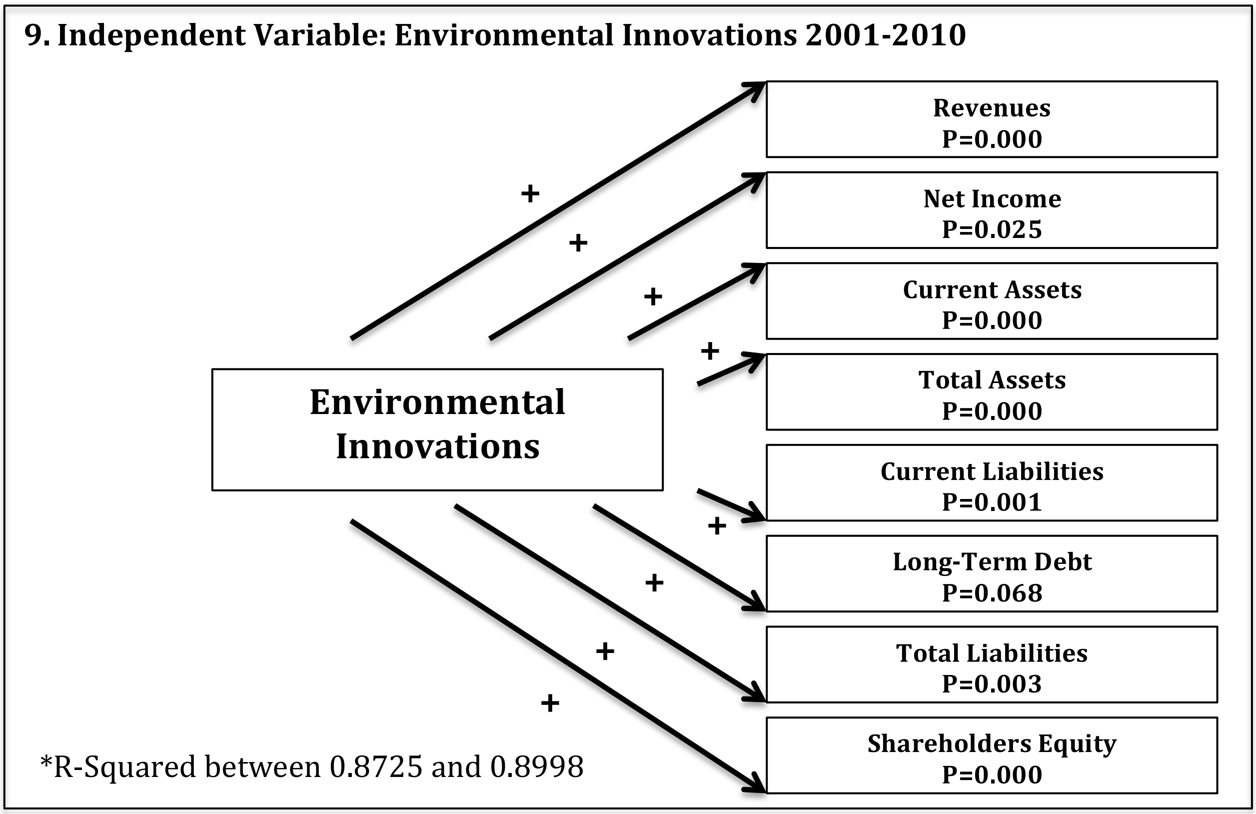
With politicians, scholars, and the public split on how environmental performance affects financial performance, it was necessary to empirically determine which side of the table environmental performance is actually on. Using environmental performance as both the independent and dependent variable on a panel regression and a Granger analysis to see whether or not environmental and financial performance participate in a virtuous cycle, we see mixed results as will be discussed in detail below.

Panel Regression: Preliminary Findings

The two objectives were to test for multiple financial performance variables and longitudinally—test for time. The variables initially used were revenues, cost of sales, net income, total current assets, intangible assets, total assets, total current liabilities, total long term debt, total liabilities, inventory, and owners equity from 2001 through 2010 as described in the previous methodology section. Prior to reviewing the results, tests were similarly run from 2001 to 2005 and 2006 to 2010 on the same variables to determine whether or not the results would hold up over time.

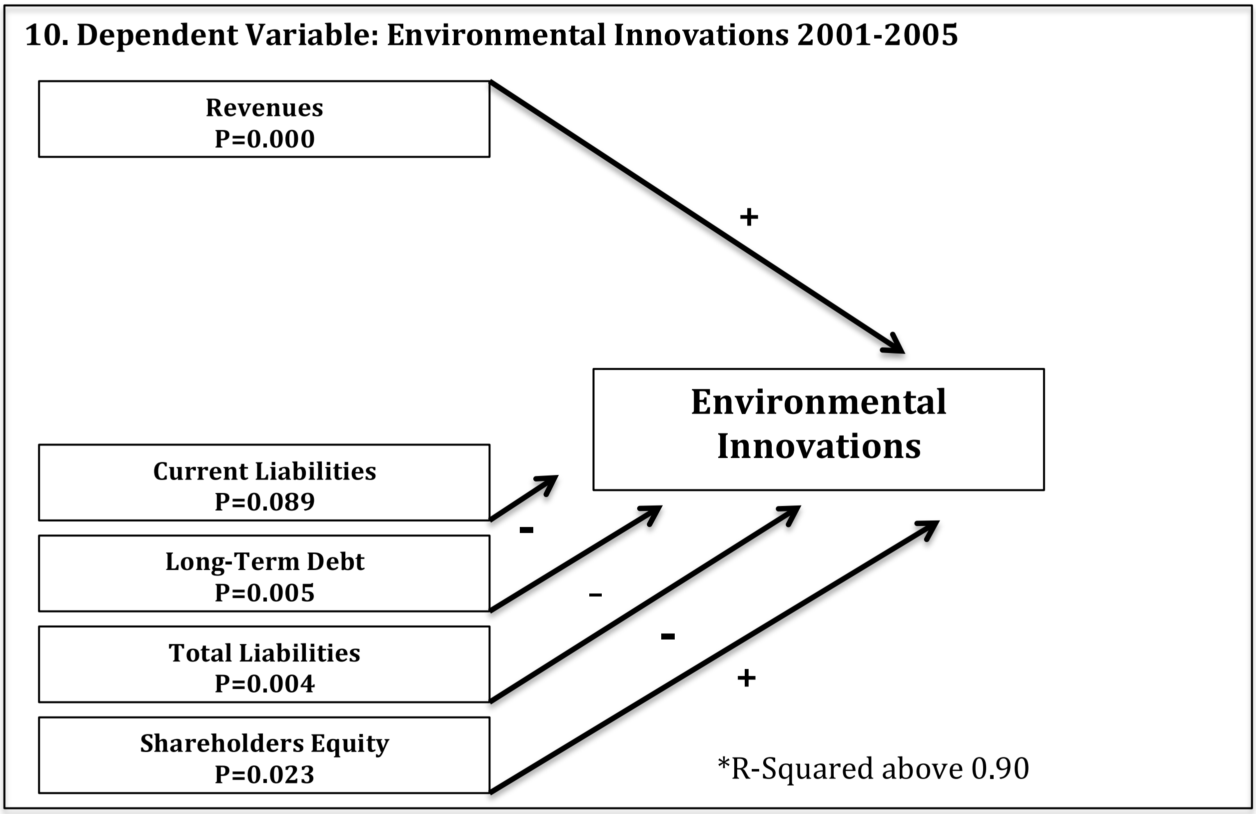


The results were mixed depending on the period and whether environmental performance was the independent or dependent variable. Testing the H7 hypothesis where environmental innovation is reliant on environmental performance, revenues, current assets, total assets, and owners equity are positively related with significant P-values of 0.000 and accurate R-squared factors above 0.90. These results conform to existing literature expectations where financial performance variables such as revenue generation and firm size positively influence environmental innovations. Current liabilities and total liabilities had significant P-values below 0.01 while long-term debt was mildly significant with a P-value of 0.068. The first two factors were highly accurate with R-squared factors above 0.96 and long-term debt was slightly less accurate with an R-squared of 0.9089, though still within the realms of being statistically viable. However, contrary to expectations where reduced accounting risk positively influences environmental costs, the positive long-term debt, current liabilities and total liabilities coefficients would imply that as these accounting risks increased, so did environmental costs. Net income was the only variable that could not be accurately predicted though there is some significance.

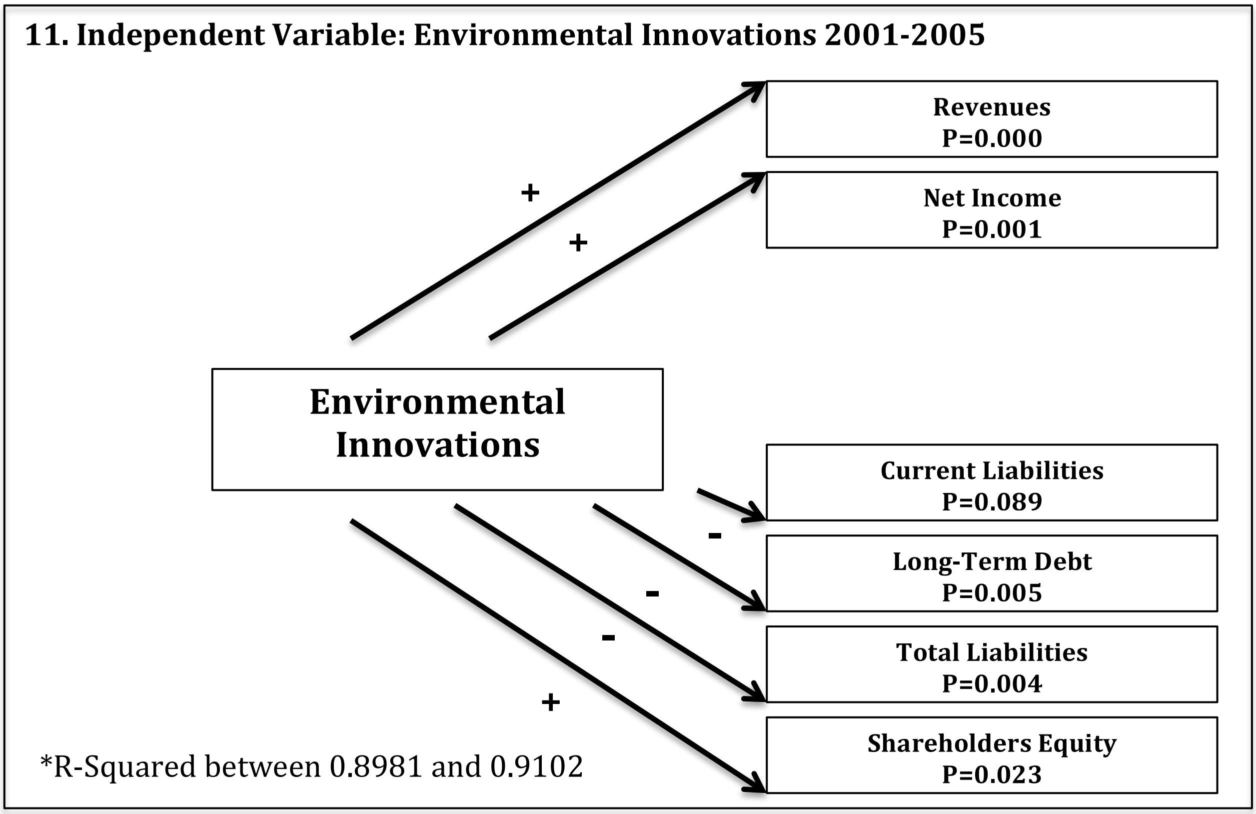


Testing for the H1, H2, H3, H4, H5, and H6 hypotheses where financial performance is dependent on environmental innovations, we once again are presented with mixed results. The H1, H2, H3, H4, and H6 hypotheses are supported by the panel regression. That is to say with significant P-values of 0.000 revenue generation, liquidity, firm size, and shareholder value are supported with profitability at a significance of P>{t} 0.025. All factors, have positive coefficients, implying that environmental performance positively influences financial performance. During the ten-year period, however, hypothesis H5 where environmental innovations reduce accounting risk through the reduction of contingent liabilities and the implied long-term debt is not validated. Rather, environmental innovations seem to positively influence (increase) accounting risk through current liabilities, long-term debt, and total liabilities. Of significance is that no single variable was accurately analyzed with a R-squared above 0.900. Rather, the R-Squared ranging from 0.873 to 0.899 implies that it is relatively accurate, yet not definitive.

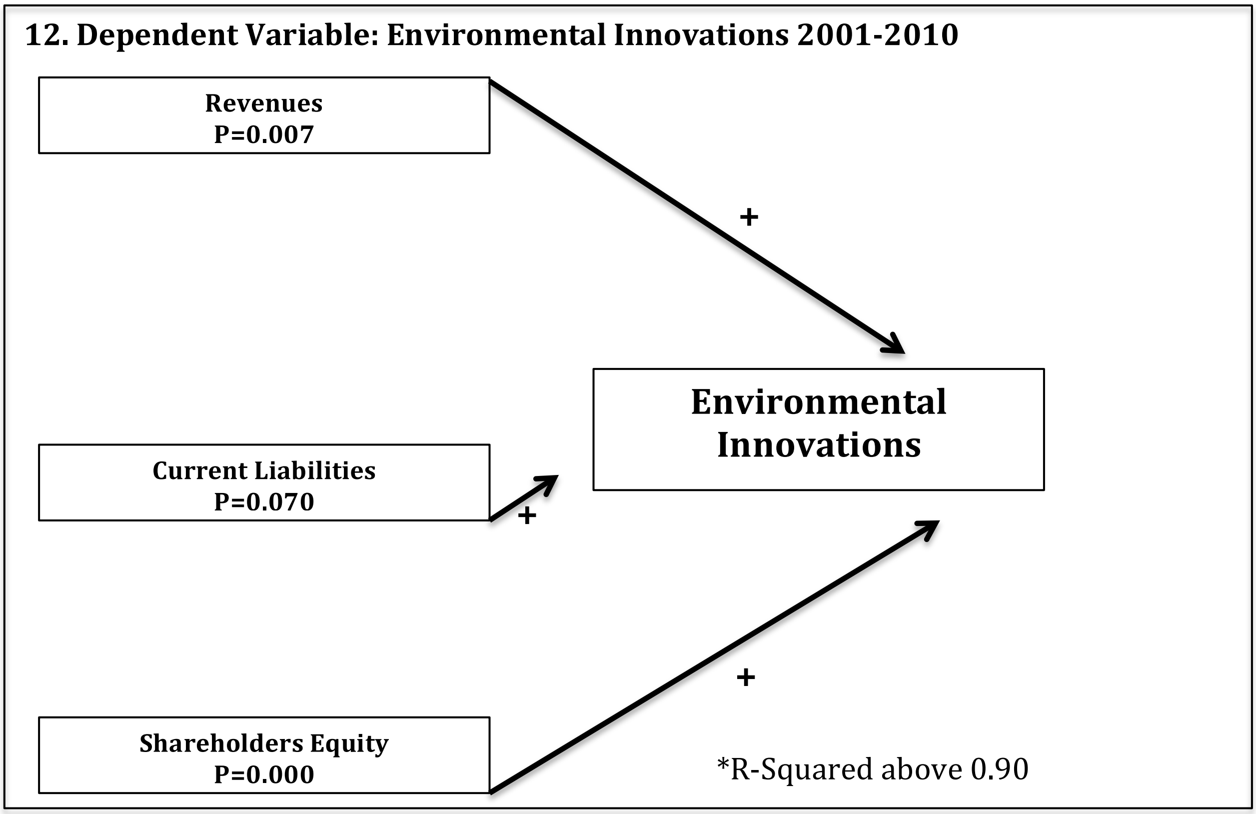
As mentioned above, it was considered to be of importance to test longitudinally for time especially in light of the global economic crisis. Therefore, to test whether or not economic turmoil or other dynamic industry shifts affect the relation between environmental innovations and financial performance, the decade is divided into two five year segments: 2001 to 2005 and 2006 to 2010.



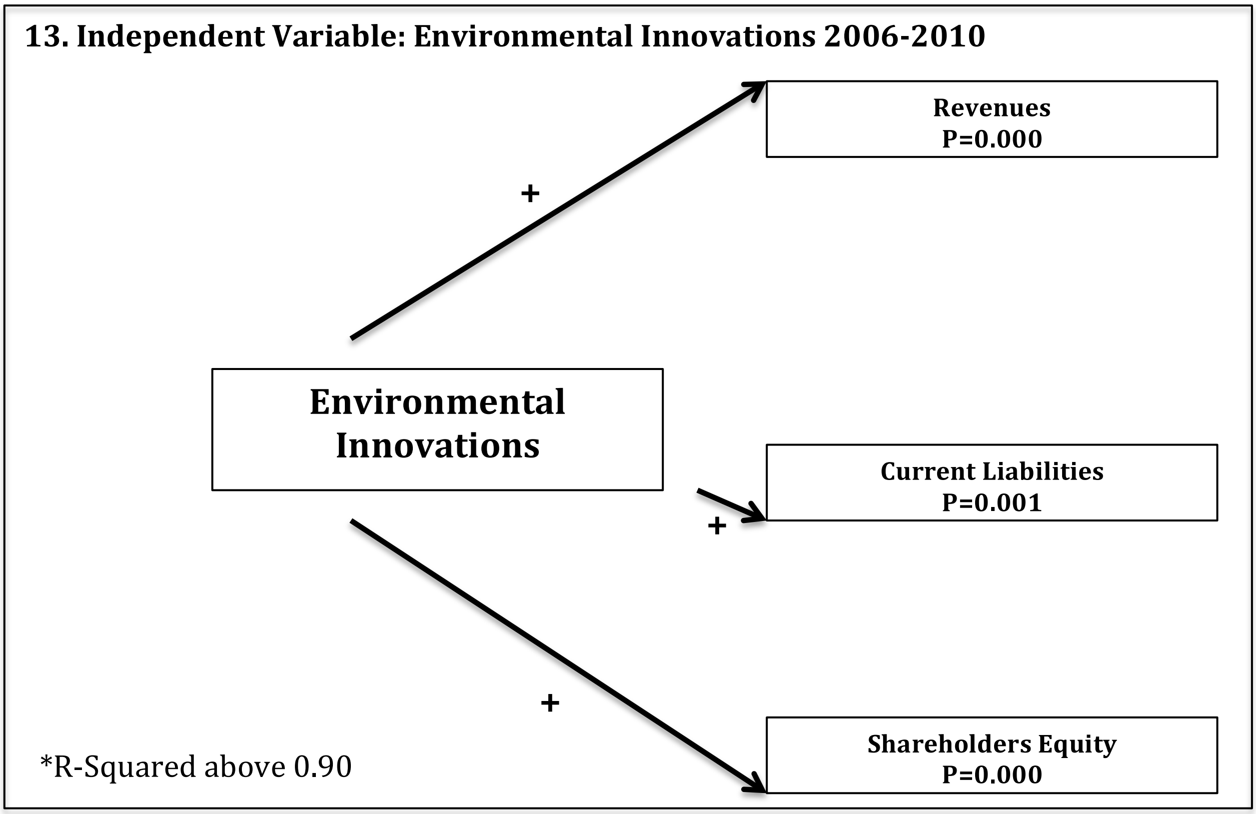
Testing for hypothesis H7 where environmental cost is dependent on financial performance, results differ from the entire 2001 to 2010 period. The only financial performance variables that maintain the same positive relation are the revenue generation and shareholder value with P-values of 0.000 and 0.023, respectively. However, the coefficient is significantly reduced, implying that the impact of revenues and owner's equity was less during the first half of the decade than the entire decade. The net income profitability variable, identical to the initial 2001 to 2010 results, cannot be accurately determined whereas profitability measured by liquidity (current assets) losses significance during the earlier period. More supportive of literature, there is a negative relation between accounting risk and environmental costs implying that, as the negative coefficient indicates, long-term debt and liabilities will reduce the costs of environmental performance.



Evaluating whether or not environmental innovations will determine financial performance during the first half of the decade provided similarly different results. Hypothesis H1, H2 where environmental innovations will generate revenues and improve profitability via net income are supported as it was throughout the entire decade. However, validating profitability through liquidity, the significance of this test no longer supports the H3 hypothesis. Similarly, firm size (total assets) is not of significance and does not support the H4. Even though the significance of accounting risk was contrary to the H6 hypothesis during the entire decade, the first half of the decade supports the H6 where accounting risk is reduced through environmental innovations. The H5 owner's equity/environmental performance relation is further supported. Of key significance, the accuracy or all variables tested surpasses the R-Squared threshold of 0.900 with exception to liquidity and firm size, which nonetheless do not support their respective hypothesis.



The latter half of the decade demonstrates significantly different results from that of entire decade and especially that of the first half of the decade. Whereas eight of the nine tested variable and six of nine variables were significant when testing the H7 hypothesis during the ten year and first five year periods, respectively, the second five year period rendered only one truly significant result and two mildly significant results. Firm size (total assets) and profitability measured by liquidity no longer influence environmental innovation efforts. Furthermore, where profitability through net income was significant, yet inaccurate for the previous periods, the 2006 to 2010 period reveals that net income is of absolutely no significance. Although accounting risk coefficients contradict literature with positive relations, statistics accurately show that there is no significance between 2006 and 2010 with exception of current liabilities, which is mildly significant. Shareholder value, per expectations, positively influences environmental innovations but with slightly less significance just surpassing the 0.05 P-value cutoff.



The remaining hypotheses signify an equally dynamic shift during the second half of the decade. Only the H1 environmental innovations positive impact on revenue generation holds truly significant. Profitability measured through net income (H2) and liquidity (H3) does not withstand the changing dynamics of the industry nor does firm size (H4). Accounting risks (H6) are not only insignificant but the coefficient contradicts the hypothesis and is determined to fail over time. Hypothesis H5, where shareholder value is generated through environmental innovations, is mildly supported with a significant P-value of 0.06. However, because the coefficient is significantly reduced, the impact of environmental costs on shareholder value is waning towards the latter half of the decade.

Comparing side by side the coefficients, significance, and accuracy may provide insight as to where and when shifts occurred. Examining the H7 hypothesis where financial performance determines environmental costs, we immediately see that revenue generation is the only factor that has a positive, significant, and accurate result through the test of time with shareholder value showing similar results while being slightly less significant only during the latter half of the decade. Profitability in terms of net income would show us that there is a positive and significant relation for the first two tests, yet the results are too inaccurate to provide us with significant insight to support H7. Curiously, liquidity and firm size affect environmental innovations throughout the entire decade, yet are not significant in either the first or second half of the decade. Accounting risk demonstrates all three possible patterns with accuracy. Long-term debt and liabilities contradict the hypothesis that reduced risk will negatively affect environmental performance when observing the entire decade, support the hypothesis during the first half of the decade, and are insignificant during the second half of the decade.

14. Dependent Variable: Environmental Cost Summary

Independent	Coefficient			P> {t}			R-Squared			Hypothesis		
	2001-2010	2001-2005	2006-2010	2001-2010	2001-2005	2006-2010	2001-2010	2001-2005	2006-2010	2001-2010	2001-2005	2006-2010
Revenue	+	+	+	○	○	○	○	○	○	H7 ○	H7 ○	H7 ○
Net Income	+	+	+	○	○	×	×	×	×	H7 △	H7 △	H7 △
Total Current Assets	+	+	+	○	×	×	○	○	○	H7 ○	H7 △	H7 △
Total Assets	+	−	+	○	×	×	○	○	○	H7 ○	H7 △	H7 △
Total Current Liabilities	+	−	+	○	△	△	○	○	○	H7 ×	H7 ○	H7 ×
Total Long Term Debt	+	−	+	△	○	×	○	○	○	H7 ×	H7 ○	H7 △
Total Liabilities	+	−	+	○	○	×	○	○	○	H7 ×	H7 ○	H7 △
Owners Equity	+	+	+	○	○	△	○	○	○	H7 ○	H7 ○	H7 ○
	+ = Variable positively — = Variable negatively			*○ = P−Value < 0.050 *△ = P−Value < 0.10 *× =			*○ = R−Squared > 0.90 *△ = R−Squared > 0.85 *× =			○ = Supported △ =Not Supported, Not × = Opposes		

The next observation is then whether or not hypothesis H1, H2, H3, H4, H5, and H6 fluctuate as drastically as the H7. The most observable factor is that when testing for the entire decade, results fall below the generally accepted accuracy factor of a 0.90 R-Squared whereas with exception to firm size and liquidity, all results are highly accurate when testing the two shorter periods. If we can assume that an R-Squared factor of above 0.85 is still within the realm of acceptable accuracy, we can determine that revenue generation (H1) and H5 (shareholder value) are significantly and positively affected by environmental performance no matter the circumstance. Profitability per net income is also positively impacted by environmental innovations for the first half and net decade supporting H2, but not during the second half. Hypothesis H3 (liquidity) and H4 (firm size) are only supported for the entirety of the decade but not during the individual halves. Identical to the H7 hypothesis regarding accounting risk, the H6 is supported only during the first half of the decade, disproven for the full ten years, and yet of no consequence during the latter portion of the ten years.

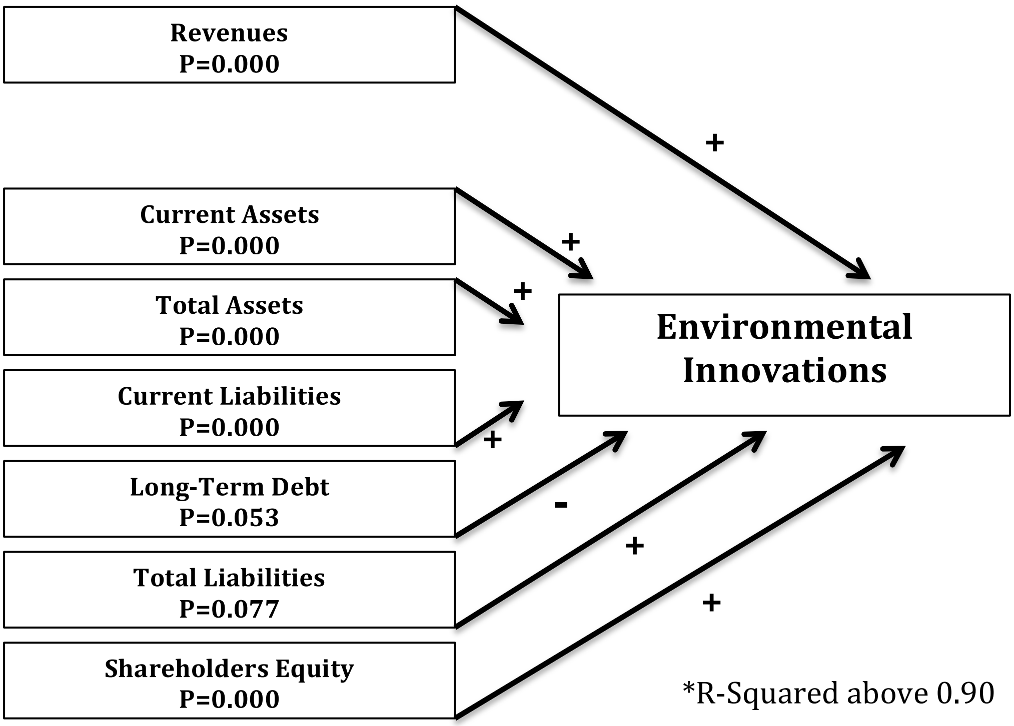
15. Independent Variable: Environmental Cost Summary

	Coefficient			P> {t}			R-Squared			Hypothesis		
Dependent	2001-2010	2001-2005	2006-2010	2001-2010	2001-2005	2006-2010	2001-2010	2001-2005	2006-2010	2001-2010	2001-2005	2006-2010
Revenue	+	+	+	○	○	○	△	○	○	H1 ○	H1 ○	H1 ○
Net Income	+	+	+	○	○	×	△	○	○	H2 ○	H2 ○	H2 △
Total Current	+	+	+	○	×	×	△	△	○	H3 ○	H3 △	H3 △
Total Assets	+	—	+	○	×	×	△	△	○	H4 ○	H4 △	H4 △
Total Current	+	—	+	○	△	△	△	○	○	H5 ×	H5 ○	H5 ×
Total Long Term	+	—	+	△	○	×	△	○	○	H5 ×	H5 ○	H5 △
Total Liabilities	+	—	+	○	○	×	△	○	○	H5 ×	H5 ○	H5 △
Owners Equity	+	+	+	○	○	△	△	○	○	H6 ○	H6 ○	H6 ○
	+ = Variable positively — = Variable negatively			*○ = P–Value < 0.050 *△ = P–Value < 0.10 *× = Insignificant			*○ = R–Squared > 0.90 *△ = R–Squared > 0.85			○ = Supported △ =Not Supported, Not * × = Opposes		

Panel Regression: Time Analysis

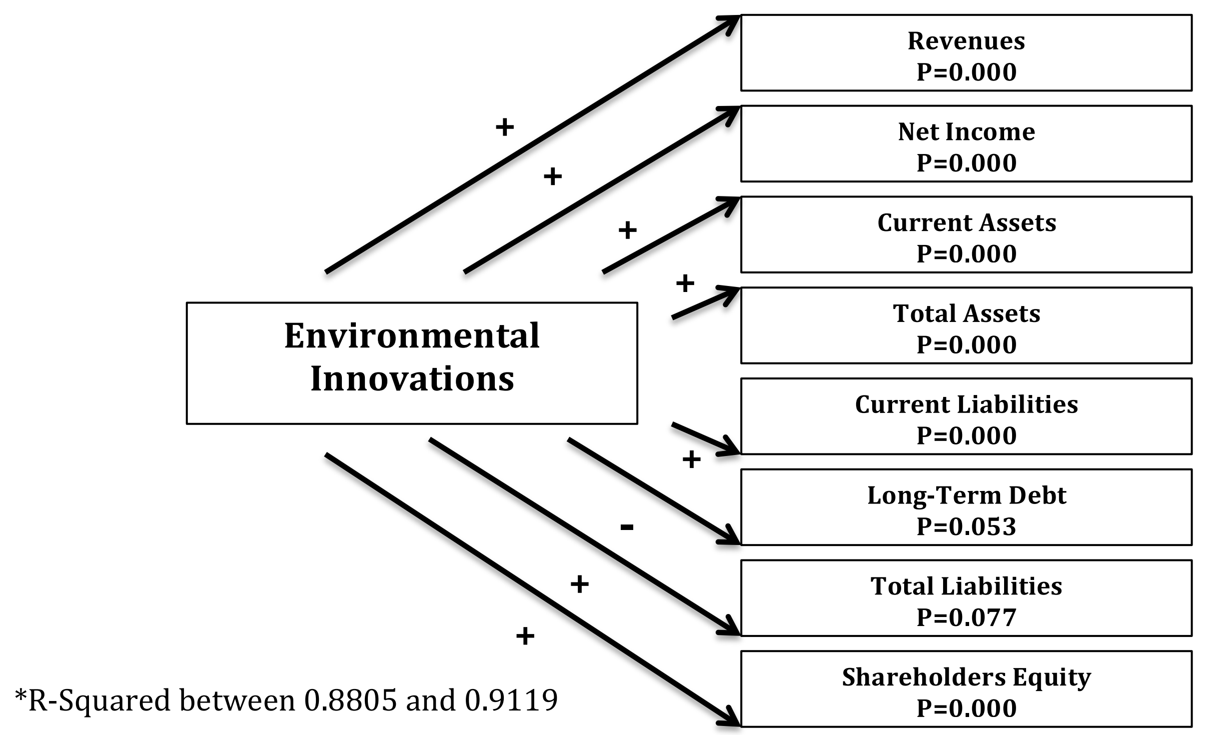
As has been demonstrated, there is little consistency when taking into consideration the variable of time. It is easy to dismiss these changes as having occurred due to the environmental crisis beginning in 2008. Inter-industry dynamics shifted, the JPY appreciated tremendously, Japan's GDP was overtaken by China, and a financial crisis still wages on in the U.S. and Europe. However, rather than simply accepting that the relation was skewed beginning in 2008, I attempt to identify which relations were shifted and when. Therefore, statistical analysis was conducted on the 2001 to 2008 and 2001 to 2009 periods to identify when each specific variable changed.

16. Dependent Variable: Environmental Innovations 2001-2008



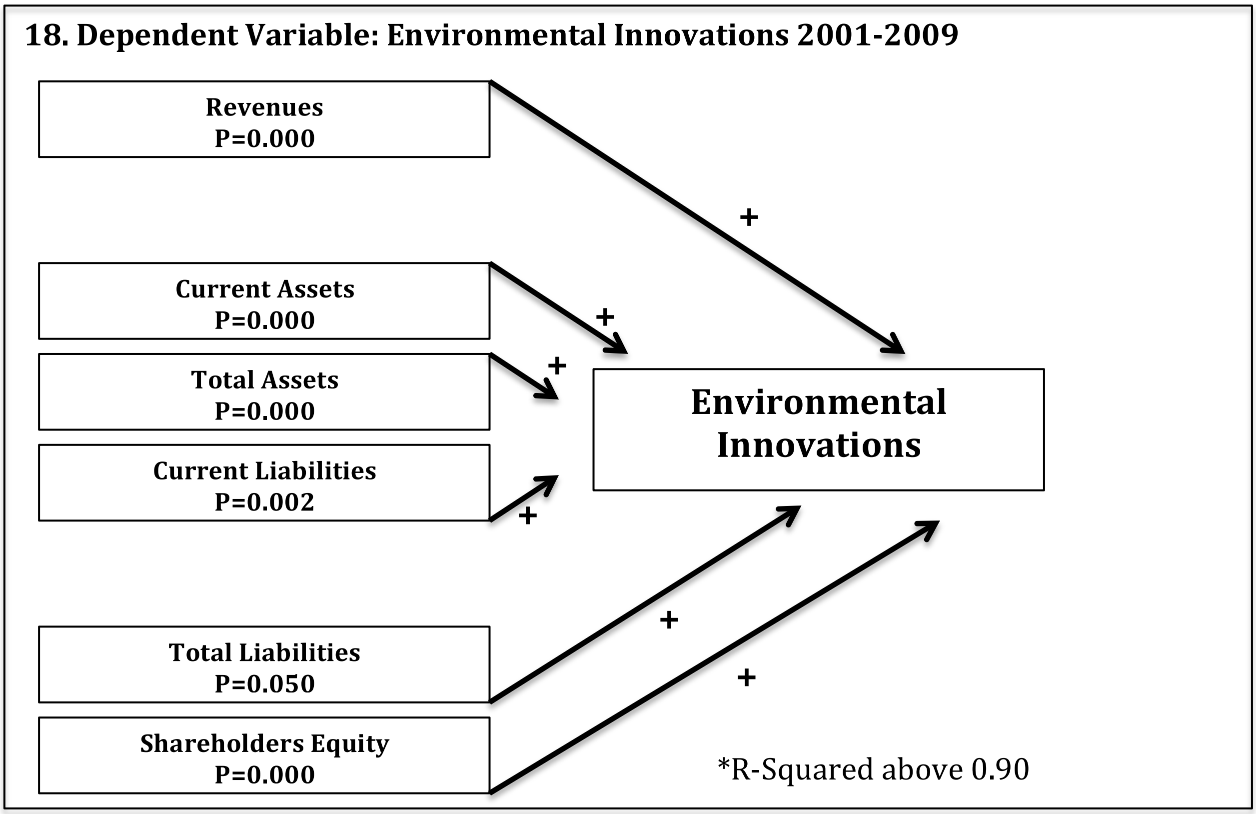
The first in depth time analysis tests for the impact of the global economic crisis beginning in 2008 with environmental cost dependent on financial performance (H7). Revenue generation, firm size, liquidity, and owner's equity conform to literature demonstrating a positive correlation that is accurate and significant with P-values of 0.000. Furthermore, accounting risk measured by long-term debt is negatively correlated to environmental innovations. The H7 hypothesis during the 2001 to 2008 period is most similar to tests run on the entire decade with one notable and significant difference: accounting risk adheres to literary expectations similar to that of the 2001 to 2005 period. However, the significance of accounting risk per long-term debt is slightly less significant than the first half of the decade, signaling that a change is occurring. Although the global crisis may have impacted firms on various levels, the effects of the crisis on financial performance was not yet fully reflected as of 2008.

17. Independent Variable: Environmental Innovations 2001-2008



The majority of the hypotheses are supported during the 2001 to 2008 era. Even though the H2 does not hold true for the 2006 to 2010 period, environmental performance continues to positively correlate to financial performance through 2008. The H1 and H5 remains statistically relevant as it did during the 2001 to 2010, 2001 to 2005, and 2006 to 2010 periods. Other than the H1 and H5, the 2001 to 2008 period has no significant corresponding relation to the 2006 to 2010 periods. Of key significance, accounting risk remains negatively correlated to environmental innovation efforts as it did in the 2001 to 2005 era. The consistency of results with that of the 2001 to 2005 with a mirrored contrast to that of the 2006 to 2010 imply that environmental innovations still affect financial performance regardless of the crisis. One significant contrast to both the 2001 to 2005 and 2006 to 2010 analysis is the support for the H3 and H4 hypothesis. Posing the question, why are firm size and liquidity affected by environmental performance only after eight years even in the light of a financial crisis.

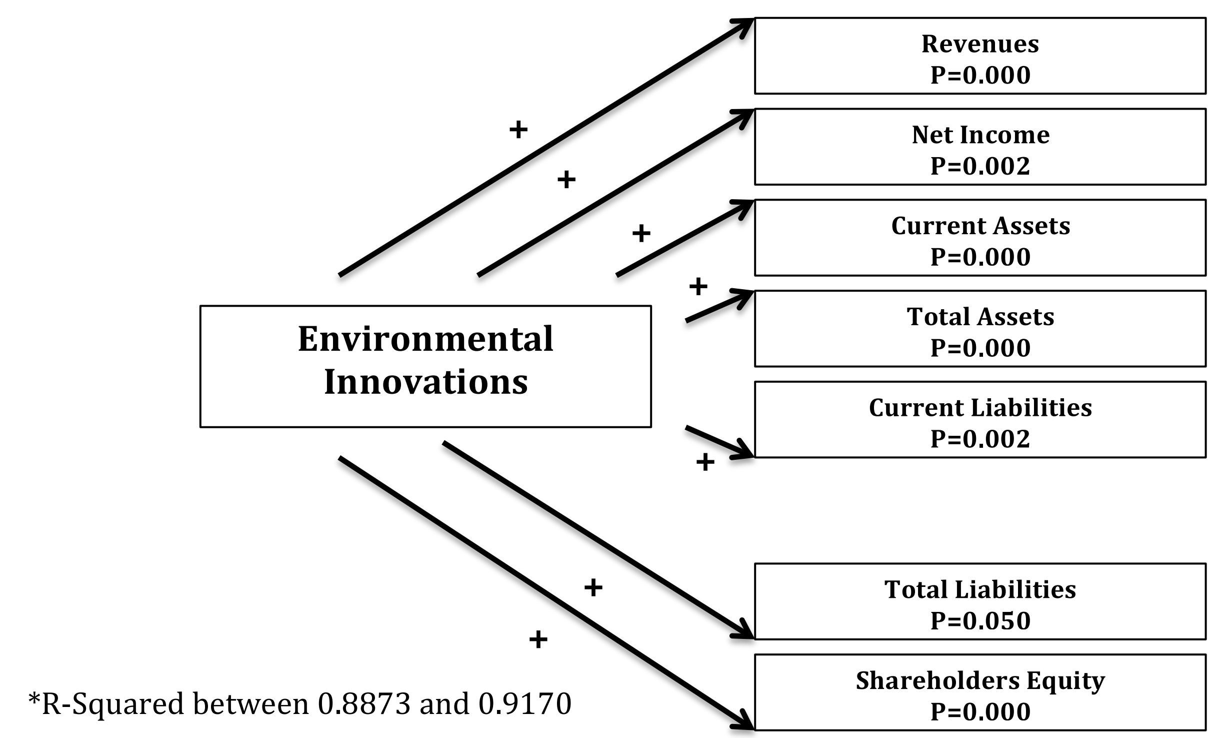
Tests on the data have suggested thus far that the financial crisis and changing dynamic of the industry have had little relation between environmental innovations and financial performance. However, it could be argued that because the financial crisis occurred during the second half of the third quarter, the firms had yet to react to the crisis. Taking into consideration that the chemical industry is reliant on the performance of end-user manufacturers such as the automotive industry as will be demonstrated in the H8 hypothesis, and perhaps less influenced by individual users chemical purchasing behavior, there may have been a time lag with the impact of the financial crisis carrying over into the following year.



Beginning with the H7 hypothesis once again, results would suggest otherwise. Excluding the effect of long-term debt on environmental innovations, results are identical to that of the 2001 t0 2010 era. Revenue generation, net income, and owners equity are on par with the 2001 to 2005 period, yet accounting risk with regards to long term debt, which was significant in the previous period, is no longer of significance. Furthermore, firm size and liquidity are uniquely significant during this period. Considering that these two factors turned significant between 2008 and 2009, yet are insignificant for shorter periods—as signified with the 2001 to 2005 and 2006 to 2010 analysis—it could be inferred that the build up of such assets are required to drive environmental innovations as suggested by Morhardt et al (2002).

The impact of environmental innovations on financial performance variables behaves similarly as the opposite effect during the same period. All financial performance variables during 2001 to 2009 depend on environmental CSP with exception of long-term debt, supporting the H1, H2, H3, H4, H5, and H6 hypotheses. Once again, behavior similar to the entire 2001 to 2010 and 2001 to 2005 implies that the financial crisis has not affected the overall relation with exception to the accounting risk associated with long-term debt H5 hypothesis and current liabilities and total liabilities. The accuracy of the results however, seem to degrade over time. The majority of significant variables during the 2001 to 2008, 2001 to 2009, and 2001 to 2010 periods have an R-Squared slightly below 0.90 whereas similarly significant variable over the 2001 to 2005, and 2006 to 2010 periods are well above the 0.90 cutoff marks. Lastly, the environmental innovation's relation with firm size (H4) and current assets (H3) supports the notion that certain financial and CSP relations are built over time.

19. Independent Variable: Environmental Innovations 2001-2009



Panel Regression: Conclusion

Now that data has empirically tested not only the relation between the variables but also the relation each component and the test of time, we can draw general conclusions about the existence of a relationship and how well it stands the test of time.

H1: The initial hypothesis where environmental performance will drive revenues in Japanese chemical firms constantly holds true regardless of time, even surviving an economic crisis. The accuracy of the statistics somewhat suffers over time, yet is still relevant with R-Squared no lower than 0.8998 occurring during 2001 to 2010 tests.

H2: The second hypothesis where environmental innovation with influence the net income of the firm holds true with exception to the shorter second half of the decade. This could be because the effects of the economic disaster can be absorbed over time, yet the immediate impact of industry changes is greater than the relation between net income and environmental innovations. This may especially be true when the industry experiences a net loss as depicted in previous sections. These results are relatively accurate with 2001 to 2010 statistics posting the lowest R-Squared score of 0.8733.

H3: Liquidity depends on environmental performance only after a longer period of time. Tests longer than eight years support the H3 hypothesis, whereas both five-year tests do not support the hypothesis. Because all three longer periods include the economic crisis, it could be suggested that liquidity is influenced by environmental innovations regardless of such turmoil. However, further tests involving future data will be required to determine beyond all doubt that this is true. The lowest R-squared is 0.8937 when considering the full ten years.

H4: Environmental cost's influence on firm size behaves similar to that of liquidity. Only total assets during the shorter two periods are not significantly related to environmental innovations whereas the longer three tests prove otherwise. Future data will be required to determine whether environmental innovation's impact on firm size is based on time alone or if economic turmoil will influence the results. The lowest R-squared 0.8875 when testing for the entire decade.

H5: Shareholder value is consistently influenced by environmental innovations and thus supports the H5. The 2006 to 2010 period with a P-value of 0.06 is the least significant of the categories. It is possible that the gap of growth in environmental innovations and owner's equity in 2006 was too large for the shorter five-year model to absorb entirely. Owner's equity grew 19.7 percent whereas environmental innovations grew only by 2.4 percent in the firms sampled. The second largest gap occurred in 2003 when owner's equity lost 0.9 percent while environmental growth was 7.2 percent over the previous periods. This could go to show that should environmental investments slow as owner's equity rapidly recovers post-crisis, the H5 hypothesis will no longer hold true. The 2001 to 2010 tests demonstrated the least accurate R-squared score at 0.8908.

H6: Accounting risk subject to environmental innovations is more complicated than other financial performance variables. The first indicator of accounting risk, long-term debt, is negatively correlated to environmental innovations, however, only for tests excluding 2009 and 2010. The only common factor for long-term debt not adhering to H5 is the inclusion of 2009 and 2010. The thirty-one sample firms incurred 14 percent and 20 percent more debt than prior periods in 2009 and 2010, respectively. This extra debt may have been required by the firms in order to maintain operations after the initial phase of the economic crisis in 2008 and net loss during the 2009 accounting period. The H6 long-term debt/environmental innovations hypothesis is in fact countered when reviewing the entire decade. Current liability and total liability accounting risk follow the proposed hypothesis only during the first half of the decade while statistics provided demonstrate evidence countering the hypothesis. The only accounting risk/environmental accounting relation of significance supporting the H6 is the relation between long-term debt and environmental performance. However, when firms are required to take on more debt than is normal for operational purposes—such as occurred after the 2009 losses—the relationship may be strained. The lowest accuracy scores with significant results occurred during the 2001 to 2010 tests yet were above 0.870 for all three accounting risk variables.

20. Environment as Independent: Hypothesis Supported/Countered

	2001-2010	2001-2005	2001-2008	2001-2009	2006-2010
Revenue	H1 ○	H1 ○	H1 ○	H1 ○	H1 ○
Net Income	H2 ○	H2 ○	H2 ○	H2 ○	H2 △
Total Current Assets	H3 ○	H3 △	H3 ○	H3 ○	H3 △
Total Assets	H4 ○	H4 △	H4 ○	H4 ○	H4 △
Total Current Liabilities	H6 ×	H6 ○	H6 ×	H6 ×	H6 ×
Total Long Term Debt	H6 ×	H6 ○	H6 ○	H6 ×	H6 △
Total Liabilities	H6 ×	H6 ○	H6 ×	H6 ×	H6 △
Owners Equity	H5 ○	H5 ○	H5 ○	H5 ○	H5 ○

○ = Supported

△ =Not Supported, Not Opposed

× = Opposes Hypothesis

H7: With exception of net income, all tested H7 variables behave identical to their H1, H2, H3, H4, H5, H6 counterparts. This is to say that financial performance influences environmental innovations in each of the five test groups in the same way that environmental innovations influence financial performance. E.g. Long-term debt opposes the hypothesis by demonstrating a positive influence on environmental innovations between 2001 to 2010. Similarly, Environmental innovations oppose the hypothesis by demonstrating a positive influence on financial performance between 2001 to 2010. The only exception to the reciprocal pattern is net income. Although net income is also consistently positively correlated to environmental costs much like environmental innovations positively influence net income, R-squared accuracy ranges between 0.4831 and 0.6413 do not allow us to draw definitive conclusions.

21. Environment as Dependent: Hypothesis Supported/Countered

Independent	2001-2010	2001-2005	2001-2008	2001-2009	2006-2010
Revenue	H7 ○	H7 ○	H7 ○	H7 ○	H7 ○
Net Income	H7 △	H7 △	H7 △	H7 △	H7 △
Total Current Assets	H7 ○	H7 △	H7 ○	H7 ○	H7 △
Total Assets	H7 ○	H7 △	H7 ○	H7 ○	H7 △
Total Current Liabilities	H7 ×	H7 ○	H7 ×	H7 ×	H7 ×
Total Long Term Debt	H7 ×	H7 ○	H7 ○	H7 △	H7 △
Total Liabilities	H7 ×	H7 ○	H7 ×	H7 ×	H7 △
Owners Equity	H7 ○	H7 ○	H7 ○	H7 ○	H7 ○

○ = Supported
△ =Not Supported, Not Opposed
× = Opposes Hypothesis

It is important to note that independence is established through autocorrelation and heteroskedasticity analysis for all variables tested in this paper. Appendix A and Appendix B show results for all tested time periods.

The Green Supply Chain: H8

Because the chemical industry is considered a part of the supply chain, perhaps even at the start of pipe, it was important to verify that the financial performance of the chemical industry is dependent on that of other industries. As shown below, the number of production units of both end-user manufacturer industries clearly influence the financial performance of the chemical industry. Even though I cannot conclude that the financial performance of the chemical industry will be directly tied to that of other manufacturers in all circumstances, these findings support the H8 hypothesis and opens the door for further research. Unfortunately, testing for the relation between the chemical industry's financial performance and all other industries is outside the scope of this research paper, however, the results here do signal that the chemical industry is a dynamic industry influenced by other industries. Therefore, because the chemical industry is subject to the purchasing power of, at the minimum, the automotive and electronic industries under legitimacy and stakeholder theories, we can conclude that the chemical industry must appeal to such stakeholders. While it is undetermined just how often outside industries subject the chemical industry to Japan's Law on Promoting Green Purchasing, perhaps evidence on inter-industrial financial performance can lay the groundwork for a more efficient green supply chain management.

Resource Based Theory:

Environmental Innovations Impacting Financial Performance

In examining the resource-based theory, the concept we must keep in mind is that environmental innovations will positively impact revenue generation, profitability, firm size (measured by total assets), and shareholder value while reducing accounting risks such as liabilities and debt. In other words, environmental performance is the independent variable affecting all other variables. In the chemical industry, I observe that environmental innovations consistently revenue generation (H1), profitability (H2), and shareholder value (H5) with exception to H2 during 2006 to 2010. Similarly, environmental innovations reduce accounting risk by negatively impacting total long-term debt (H6) given that debt growth is not drastically influenced by other economical factors such as a financial crisis. Profitability measured by liquidity (H3) and firm size (H4) also depends on environmental costs, given a previous period for asset growth. Each of these supported hypotheses demonstrate the resource based view theory as supported by an abundance of scholars (Teece, 1986; Hart & Milstein, 2003; Russo & Fouts, 1997; Christmann, 2000; Hart, 1995; Cortez; 2010)

	22. Resource Based View Support				
	2001-2010	2001-2005	2001-2008	2001-2009	2006-2010
Revenue	O	O	O	O	O
Net Income	O	O	O	O	×
Total Current Assets	O	×	O	O	×
Total Assets	O	×	O	O	×
Total Current Liabilities	×	O	×	×	×
Total Long Term Debt	×	O	O	×	×
Total Liabilities	×	O	×	×	×
Owners Equity	O	O	O	O	O
O = Resource Based View Supported					
× = Resource Based View Not Supported					

Slack Availability of Resource Theory:

Financial Performance Determining Environmental Costs

On the other hand, what if environmental innovations can only be facilitated by significant financial performances, where the environment becomes dependent on all other variables. In line with the slack availability of resource theory multiple factors found in the H7 testing have financial performance influencing environmental innovations. Revenues and perceived shareholder value (owners equity) can consistently be analyzed through the lenses of slack availability of resource theories. However, accounting risk defined by long-term debt, total liabilities, and current liabilities require more tenacity. During the entire ten-year period, and any other test including 2008 or 2009, the directional relation was counter to H7. This is to say that as long-term debt and other accounting risks increased, so did environmental innovations. Under the slack availability of resource theory, CSP occurs due to previous financial performance (Ullmann, 1985). If firms do not have the ability to absorb the burden of CSP, specifically environmental innovation, they will not perform such costly activities. Therefore, the correlation between accounting risk and environmental performance contradicts the slack availability of resources theory; firms are incurring debt and yet performing CSP activities that exceed their internal capabilities.

	23. Slack Availability of Resources Theory Support				
Independent	2001-2010	2001-2005	2001-2008	2001-2009	2006-2010
Revenue	○	○	○	○	○
Net Income	×	×	×	×	×
Total Current Assets	○	×	○	○	×
Total Assets	○	×	○	○	×
Total Current Liabilities	×	○	×	×	×
Total Long Term Debt	×	○	○	×	×
Total Liabilities	×	○	×	×	×
Owners Equity	○	○	○	○	○

○ = Slack Availability of Resources Theory Supported
× = Slack Availability of Resources Theory Not Supported

Bi-Variate Directional Granger Causality Test

The hypothesis results demonstrated that there is undoubtedly a relation with environmental performance affecting financial performance mechanisms during specific years. However, the H7 hypothesis further demonstrated that financial performance would influence environmental innovation activities. Not entirely coincidentally, with exception to net income, the influence is perfectly reciprocated. That is to say that if environmental innovations influence total liabilities during a certain period, total liabilities will also influence environmental innovations. Therefore, all factors that conform to the resource based view theory also adhere to the slack availability of resources theory. In assuming this is the case, I conclude that environmental innovations and financial performance engage in a virtuous cycle as suggested by Orlitzky (2008) where the relation is bi-directional.

Jumping to such a conclusion would be premature. True that they influence one another, yet environmental innovations *may* influence a financial performance variable such as total revenues more than total revenues influence environmental innovations. Therefore, I test whether the cycle is either virtuous or broken and if so, whether financial performance or environmental CSP has a stronger effect.

Cortez (2010) review of the Japanese automotive and electronic industry supports Nelling and Webb's (2009) findings that environmental innovations are driven more strongly by some outside source than by financial performance mechanisms, hence breaking the virtuous cycle. Within the chemical industry, however, the results seem to be mixed. Based on the thirty-one chemical firms listed on the Tokyo Stock Exchange with environmental performance data from 2001 to 2010, the virtuous cycle is more common than environmental performance being dependent on financial performance variables, vice-versa, or having no relation whatsoever when examining the relation on a company by company base.

While virtuous cycles occur more often than any other causality test, there is no single financial performance/environmental innovation relation where a virtuous cycle occurs the majority—more than 50 percent—of the time long-term debt and total liabilities come close to breaking the majority threshold. Not only does the industry engage in a virtuous cycle with regards to long-term debt but the relationship is negative as is indicated by the negative coefficient in the panel regression analysis. Existing literature also cites that environmental performance should negatively impact long-term debt, and in the near majority of cases, these findings would support such perceptions. Curiously, the panel regression implied mixed views on how long-term debt and environmental innovations corresponded, but the Granger causality test determines that the two factors are negatively correlated during this period, supporting the H6 and H7 hypotheses during 2001 to 2005 and 2001 to 2008. The industry also participates in virtuous cycles for total liabilities more often than not. Remaining firms not engaging in virtuous cycles equally support the resource based view perspective and slack availability of resources theory. Current liabilities, on the other hand, are relatively evenly split between the number of firms engaging in the virtuous cycle, resource based view, and slack availability of resources theory. Therefore, I determine that accounting risk and environmental innovations are negatively correlated with the majority of firms engaging in virtuous cycles.

The lowest number of virtuous cycles occurs when measuring net income. However, neither the resource based view or slack availability of resources theory explain the results because all outcomes are perfectly balanced. The panel regression analysis showed that it was statistically difficult to determine whether the H7 was supported due to the inaccuracy of the results. The perfect balance between virtuous, broken, and independent cycles could contribute to the statistical inaccuracy. An independent cycle is observed when firms behave in a manner where environmental costs and financial performance are independent of one another. Although I cannot conclude which direction the relation exists in the chemical industry or even if a relation exists, the significant and positive correlation of the panel regression supports that *if* firms are engaged in virtuous cycles or even broken cycles, that the corresponding relation will be positive.

Other indicators of financial performance such as total revenues, current assets, and total assets also have virtuous cycles in over thirty-five percent of the firms sampled. However, because there were only four possible outcomes, these do not stand out as clearly as long-term debt and total liabilities nor are as balanced as current liabilities or net income. With relevant accuracy, total revenues signaled positive correlations between the H1 and H7 hypotheses throughout all test periods. Even though more firms engage in virtuous cycles than any other category, chemical industry firms are more likely to experience one of the two uni-directional broken cycles. Current and total assets become significant only after a residual build up exists though virtuous cycles exist in only eleven and twelve of the thirty-one firms, respectively.

With arguments that the environment is a costly endeavor and does not add to the bottom line of the firm, it could be revealing to understand how the bottom line—shareholders equity—is in fact affected by environmental innovations. In one tenth of cases in the chemical industry, there is absolutely no causality between owner's equity and environmental performance, indicating that the two are entirely independent of one another for these firms. For proponents who state environmental innovations will in fact improve owner's equity, they are not entirely mistaken as nearly a quarter of chemical firms demonstrate that the cause for owner's equity is influenced by environmental performance. On the other hand, a slightly stronger argument could be made based on the results presented that owner's equity is the cause of environmental innovations. In other words, shareholders want the firm they own a piece of to be environmentally friendly, whether it be compliancy or going the extra mile. Similarly, nearly another third of firms are engaged in the virtuous cycle where environmental innovations improve shareholders equity and shareholders equity also increase environmental innovations. Furthermore, the relation is positive on all sides of the table. Based on these four factors, it can be inferred that environmental innovations in fact do not harm the bottom line of the firm. Rather, by engaging in environmental innovations firms create shareholder value and increase equity, owner's of the firm demand that the firm be environmentally compliant and friendly, or it is a little of both. Regardless, the environment and shareholders are in a positive relation, expunging any doubt that environmental obligations will reduce shareholder value.

24. Virtuous, RBV, or Slack Theory: Total Count

	Virtuous	Resource Based View	Slack Availability of Resources
Total Revenues	10	6	7
Net Income	7	7	7
Current Assets	11	7	9
Total Assets	12	5	8
Current Liabilities	7	7	9
Long Term Debt	13	9	5
Total Liabilities	14	7	7
Owner's Equity	9	7	10
Total	83	55	62

As has been discussed in this section, the Granger causality test has revealed interesting results. However, while we can claim general trends or the lack there of, there is no distinctive relationship with accurate significance that states environment and finances will be either virtuous or caused by one or the other the majority of the time. The table above depicts an industry that has more virtuous cycles per than any other option, yet the majority of firms will treat the financial performance/environmental innovations relation as either conforming to the resource based view or slack availability of resources theory. Therefore, rather than viewing the industry as a whole, it may also be worthwhile to examine how individual firms participate in this relationship. Objectively, I would like to see whether certain firms are generally virtuous, adopt the resource-based view, or take the slack availability of resources approach.

Viewing the virtuous cycle relation horizontally, where identifying whether or not specific companies stand out, I observe distinct results. Out of the thirty-one companies observed, two thirds of the firms demonstrated distinct trends across the board. Ten firms upheld virtuous cycles, five demonstrated resource based behavior where financial performance is improved through environmental innovations, and six signified slack availability of resources as indicated by the causality indicator that financial performance creates environmental innovations. The remaining ten firms have a balanced mix depending on the financial performance mechanism in question. The question is then what does each of these firms have in common.

By categorizing firms as either majorly virtuous, resourced based, slack availability of resources, or generally balanced, a pattern emerges. Firms who were more virtuous than others were virtuous in every individual financial performance category and no single financial performance variable was independent of environmental costs. Firms conforming to the resource-based view applied themselves in this way the majority of time in all financial categories except where current assets are concerned. Slack availability of resource firms were uniformly slack oriented with exception of net income, current assets, and total liabilities. Lastly, firms that had balanced results, that is to say firms who exerted all four available behaviors in a relatively balanced manner were balanced with exception to current assets and long-term debt. The outcome of these four categorizations is that if a firm is virtuous, dependent on environmental performance, influences environmental performance through financial mechanisms, or is spread across all aforementioned categories evenly, they will exert those behaviors with regards to total revenues, cost of sales, firm size, long-term debt, and owner's equity. This supports Cortez (2010) findings that the likelihood of virtuous cycles cannot be determined by firm size alone. Furthermore, comparing the categorization of firms behavior shows that the majority of Nikkei 225 chemical firms will show no specific causality pattern with no firms adopting the resource-based view perception.

25. Firm Specific Virtuous, RBV, Slack Behavior	Total Revenues			Net Income			Current Assets			Total Assets		
	Virtuous	RBV	Slack	Virtuous	RBV	Slack	Virtuous	RBV	Slack	Virtuous	RBV	Slack
1. Aica	○						○			○		
2. Asahi Kasei			○			○						○
3. Asahi Organic Chemicals		○		○				○			○	
4. Central Glass						○	○			○		
5. Daicel			○					○			○	
6. Dic Corporation		○			○							
7. Hitachi Chemical		○		○			○			○		
8. Hokko Chemical Industry									○			○
9. Kansai Paint					○			○			○	
10. Kuraray Co	○			○					○	○		
11. Kureha												○
12. Mitsubishi Chemical									○			
13. Mitsui Chemical			○						○			○
14. Nippon Paint	○					○		○			○	
15. NOF Corp		○			○		○					
16. Sanyo Chemical	○						○			○		
17. Sekisui Chemical	○				○		○					
18. Sekisui Jushi	○			○				○		○		
19. Shin-Etsu Chemical	○			○					○	○		
20. Shin-Etsu Polymer				○			○			○		
21. Showa Denko KK	○					○	○			○		
22. Sumitomo Chemical		○			○							
23. Taiyo Nippon Sanso			○			○	○			○		
24. Toagosei	○			○				○			○	
25. Tokuyama Corp									○			○
26. Tosoh Corp			○						○			○
27. Toyo Ink Sc Holdings			○			○	○			○		
28. Ube Industries								○		○		
29. Kaneka Corp	○					○			○			
30. Nippon Kayaku		○			○				○			○
31. Nippon Shokubai			○		○		○					○

25. Firm Specific Virtuous, RBV, Slack Behavior Cont.	Current Liabilities			Long Term Debt			Total Liabilities			Owner's Equity			Firm Specific Relations		
	Virtuous	RBV	Slack	Virtuous	RBV	Slack	Virtuous	RBV	Slack	Virtuous	RBV	Slack	Virtuous	RBV	Slack
1. Aica	○			○			○				○		6	1	0
2. Asahi Kasei			○			○	○					○	1	0	6
3. Asahi Organic Chemicals	○			○			○			○			5	3	0
4. Central Glass	○			○			○			○			6	0	1
5. Daicel				○				○		○			2	3	1
6. Dic Corporation		○							○		○		0	4	1
7. Hitachi Chemical					○		○			○			5	2	0
8. Hokko Chemical Industry		○			○		○					○	1	2	3
9. Kansai Paint		○		○				○			○		1	6	0
10. Kuraray Co		○		○			○						5	1	1
11. Kureha			○			○						○	0	0	4
12. Mitsubishi Chemical			○	○					○				1	0	3
13. Mitsui Chemical			○	○					○			○	1	0	6
14. Nippon Paint		○			○			○		○			2	5	1
15. NOF Corp	○						○				○		3	3	0
16. Sanyo Chemical	○			○			○			○			7	0	0
17. Sekisui Chemical						○		○				○	2	2	2
18. Sekisui Jushi	○				○		○				○		5	3	0
19. Shin-Etsu Chemical						○			○		○		3	1	3
20. Shin-Etsu Polymer			○						○	○			4	0	2
21. Showa Denko KK			○		○				○	○			4	1	3
22. Sumitomo Chemical		○			○			○					0	5	0
23. Taiyo Nippon Sanso				○			○					○	4	0	3
24. Toagosei			○		○		○			○			4	3	1
25. Tokuyama Corp			○		○		○					○	1	1	4
26. Tosoh Corp												○	0	0	4
27. Toyo Ink Sc Holdings		○				○		○				○	2	2	4
28. Ube Industries	○			○									3	1	0
29. Kaneka Corp					○			○					1	2	2
30. Nippon Kayaku				○			○				○		2	3	2
31. Nippon Shokubai			○	○					○			○	2	1	5

Managerial Implications and Further Discussion

A relationship exists between environmental innovations and financial performance. At the same time, however, there are larger factors that could impact the industry, as would be indicated by altering support for stated hypotheses depending on the time period tested. A leading example would be long-term debt. Although literature finds that environmental CSP should be negatively correlated with long-term debt, when the industry is required to take on larger debt that goes beyond the norms of operations while maintaining environmental responsibility, the relation contradicts the hypothesis and the relation can turn positive. This sort of relation contradicts the slack availability of resource theory where firms will invest in environmental care only when they have resources available. On the other hand, financial performance mechanisms such as shareholder value and total revenues seem to sustain the test of time and can even withstand environmental crisis. Certain aspects of the firm, though, require a build up over time before environmental and financial relations begin to exist, as indicated by current and total assets. Therefore, the most important managerial implication is that, as this case study shows, managers should understand the actual relations and what influence these relations before going all in or dismissing environmental responsibilities.

As would be indicated by firm size and liquidity, smaller firms may not be able to establish positive relations between environmental and financial performance. Therefore, they may decide to delay environmental innovations until they can adopt mimetic environmental practices (Christmann, 2000). According to Zhu et al (2010), "mimetic pressures are not a main driver for Japanese large company". However, not all 154 Tier 1 Tokyo Stock Exchange listed chemical firms are 'large', and so mimetic pressures may influence environmental organizational changes under institutional theory (DiMaggio & Poerll, 1983).

Firms adopting the Ministry of Environment's guidelines on environmental accounting include a section that shows the economic benefit of their environmental innovations. Although outside the statistical scope of this research, a look at these environmental statements show that environmental costs far outweigh economic benefits. For example, Sumitomo Chemical Co., Ltd. spent approximately JPY 45.5 billion on environmental innovations during the 2010 financial period, yet the direct economic benefit was only JPY 6.2 billion. With such a large gap in spending and benefits, it is no wonder that politicians claim environmental innovations are too large to sustain. Engaging in a resource based view across the board, however, Sumitomo Chemical's environmental innovations tended towards positively influencing shareholder value while positively affect revenues and net income while reducing accounting risk factors such as long term debt and current and total liabilities. In this light, environmental innovation activities sound more like a magic bean assured to improve the firm. However, managers in the decision making process should use caution and not jump to the conclusion that environmental innovations will undoubtedly improve finances. Rather, environmental innovations can be advantageous profit centers to firms if implemented relative to existing financial performance and should not be dismissed as simply being 'costly', supporting the resource based view.

On the other hand, even some of the larger firms demonstrate support for the slack availability of resources theory. Asahi Kasei Corp, a Nikkei 225 firm, conformed to the slack availability of resources theory for the majority of factors tested. That is to say that financial performance was a stronger indicator of environmental innovation efforts. Sumitomo Chemical and Asahi Kasei are similar in many manners, but one clear distinction was the amount of environmental innovations relative to financial performance variables. On average, Sumitomo Chemical spent 2.2 percent of revenues on environmental innovation whereas Asahi Kasei spent on 0.8 percent. At the turn of the century, Asahi Kasei led Sumitomo Chemical in terms of revenue by 18 percent, however, by 2011, the tides had turned and Sumitomo Chemical led by 24 percent. Although further research would be required to statistically determine whether this scenario holds true, based on these two firms it could be inferred that the resource based view is more advantageous to the firm's revenue structure than the slack availability of resources theory in regards to environmental CSP.

It would be interesting for scholars to determine what in fact causes environmental innovations. Under the institutional theory, scholars have found that Japanese firms are subject to normative pressures where firms will lose market share if the stakeholders are not satisfied with their social and environmental performance. Furthermore, the legitimacy and stakeholder theories would suggest that firms strive to maintain a certain level of acceptance in order to conduct business. Because the selected Japanese chemical firms earn revenues primarily as suppliers to other industries, the chemical industry may engage in environmental innovations in order to maintain the supplier-buyer relation. However, because multiple relations exist in the market, such as the one with shareholders, further research is needed to determine which relation most influences the chemical industry. Perhaps if firms can identify with whom they must first and foremost establish then maintain a relation with, firms will be able to more efficiently manage CSP activities.

No matter how CSP activities are managed, without clear and strict reporting requirements, quantifying such is an innately difficult task. Japan's Ministry of Environment provides 'guidelines' on how to treat environmental activities, yet without definitive generally accepted accounting principles, results will not necessarily be comparable across time, industries, or nations. With environmental concerns gaining public traction, the introduction of new environmental accounting principles may be on the horizon. With these new principles future investment analysts, stockholders, and other stakeholders may engage in relations with the firm based not simply on traditional financial performance mechanisms. If firms are subject to public discretion, firms could potentially improve environmental innovations in order to appease the public and establish legitimacy. Perhaps then and only then will environmental innovation truly establish sustainability for further generation's future.

Conclusion

As the firm continues to evolve to meet fit its environment, there will, without a doubt, be an ever increasing demand for environmental innovations. There are some scholars who find such innovations to be costly, for which they are justified, considering the immediate returns are dismal at best. However, it could be argued that the cost of not taking environmental responsibility will be even more disruptive to the economic firm. Regardless of the current or future costs and benefits of investing in the environment, I have demonstrated in this research study that there is an overall positive relationship between financial performance and environmental innovations with exception to times of economic crises. Environmental innovations will generate positive financial performance, especially with consideration to revenue generation and shareholder value. Conversely, accounting risk represented by long-term debt is also reduced through environmental innovations. Similarly, the statistical analysis demonstrates that positive financial performance will spur environmental CSP. In order to determine which factor—either environmental innovations or financial performance—would drive the other factor more, I find mixed results. This is to say that depending on the financial variable tested or the firm tested, the support for the resource-based view, slack availability of resource theory, and the virtuous cycle are all supported. These findings will hopefully motivate managers to conduct environmental CSP regardless of the criticism they receive for costly environmental expenditures.

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Appendix A. Independent Variable: Environmental Cost

	Coeff.					
Dependent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0.0104371	0.0162506	0.0070494	0.0101613	0.0105625	0.010148
Cost of Sales	0.0121743	0.021925	0.0054664	0.0121193	0.0126546	0.0118044
Net Income	0.01886674	0.0496876	0.005276	0.060181	0.576215	0.0238294
Total Current Assets	0.02102343	0.0027028	0.0074464	0.0170405	0.0201445	0.0186757
Total Assets	0.0082681	-0.0058852	0.0038095	0.00828	0.0097347	0.0090037
Total Current Liabilities	0.0140047	-1.35E-02	1.06E-02	9.06E-03	1.82E-02	1.39E-02
Total Long Term Debt	0.0077371	-2.95E-02	3.47E-03	-1.61E-02	-1.37E-01	-2.77E-03
Total Liabilities	0.0068681	-1.56E-02	3.03E-03	1.54E-03	6.03E-03	5.72E-03
Owners Equity	0.014213	1.73E-02	9.90E-03	1.56E-02	1.56E-02	1.43E-02

	P> {t}					
Dependent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0.000	0.000	0.007	0.000	0.000	0.000
Cost of Sales	0.000	0.000	0.129	0.000	0.000	0.000
Net Income	0.025	0.001	0.594	0.000	0.000	0.002
Total Current Assets	0.000	0.782	0.184	0.000	0.000	0.000
Total Assets	0.000	0.252	0.122	0.000	0.000	0.000
Total Current Liabilities	0.001	0.089	0.070	0.101	0.000	0.002
Total Long Term Debt	0.068	0.005	0.519	0.025	0.053	0.637
Total Liabilities	0.003	0.004	0.367	0.663	0.077	0.050
Owners Equity	0.000	0.023	0.060	0.000	0.000	0.000

	R-Squared					
Dependent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0.8998	0.9102	0.9556	0.9206	0.9119	0.917
Cost of Sales	0.8982	0.9113	0.9538	0.9192	0.9106	0.9155
Net Income	0.8733	0.9067	0.9531	0.9162	0.8978	0.8899
Total Current Assets	0.8937	0.8981	0.9537	0.9114	0.9019	0.9052
Total Assets	0.8875	0.8992	0.9539	0.9083	0.8969	0.9013
Total Current Liabilities	0.8762	0.9005	0.9542	0.8996	0.8854	0.8898
Total Long Term Debt	0.8725	0.9043	0.9532	0.9009	0.8808	0.8857
Total Liabilities	0.8751	0.9048	0.9533	0.8982	0.8805	0.8873
Owners Equity	0.8908	0.9023	0.9543	0.9162	0.9033	0.9062

Appendix A Cont. Independent Variable: Environmental Cost

	Adj. R-Squared					
Dependent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0.8887	0.8876	0.9444	0.9073	0.8993	0.9066
Cost of Sales	0.8868	0.889	0.9422	0.9057	0.8977	0.9049
Net Income	0.8592	0.8832	0.9413	0.9021	0.8832	0.8761
Total Current Assets	0.8818	0.8725	0.9420	0.8965	0.8879	0.8933
Total Assets	0.8749	0.8737	0.9423	0.8929	0.8821	0.8889
Total Current Liabilities	0.8624	0.8753	0.9427	0.8828	0.8690	0.8760
Total Long Term Debt	0.8583	0.8802	0.9414	0.8842	0.8637	0.8713
Total Liabilities	0.8612	0.8808	0.9416	0.8812	0.8633	0.8732
Owners Equity	0.8786	0.8777	0.9428	0.9022	0.8895	0.8944

	VIF					
Dependent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	3.25	9.49	6.66	21.84	16.16	3.15
Cost of Sales	2.93	8.14	5.96	17.26	12.89	2.84
Net Income	1.97	1.99	1.99	2.29	2.86	1.97
Total Current Assets	3.44	11.84	7.21	25.34	20.09	3.49
Total Assets	3.74	17.33	6.93	38.04	28.55	4.26
Total Current Liabilities	4.23	7.91	4.73	49.48	41.02	4.88
Total Long Term Debt	2.71	5.58	2.64	26.59	23.03	3.40
Total Liabilities	4.08	10.53	4.66	58.18	49.73	5.50
Owners Equity	2.67	6.40	8.21	13.22	10.17	2.67

	Prob >Chi2					
Dependent Variables	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Revenue	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cost of Sales	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Income	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Current Assets	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Assets	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Current Liabilities	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Long Term Debt	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Liabilities	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Owners Equity	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Appendix B. Dependent Variable: Environmental Cost

Independent Variables	Coeff.					
	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	21.43409	7.334845	7.661326	21.68881	25.91354	27.09412
Cost of Sales	17.31609	5.925734	3.198432	17.10919	20.75678	22.17418
Net Income	0.9594936	1.702801	0.4125935	2.942831	2.7359	1.602143
Total Current Assets	8.746856	0.2316711	1.807647	7.626249	9.505995	9.197751
Total Assets	15.45428	-1.807099	4.760229	12.04481	15.43699	15.25565
Total Current Liabilities	2.904093	-1.727201	2.35E+00	1.60E+00	3.04E+00	2.68E+00
Total Long Term Debt	1.54051	-2.07503	9.17E-01	-1.67E+00	-1.26E+00	-3.26E-01
Total Liabilities	4.633444	-4.217294	2.06E+00	6.71E-01	2.40E+00	2.71E+00
Owners Equity	10.82984	2.410195	2.70E+00	1.14E+01	1.30E+01	1.25E+01

Independent Variables	P> {t}					
	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0	0	0.007	0	0	0
Cost of Sales	0	0	0.129	0	0	0
Net Income	0.025	0.001	0.594	0	0	0.002
Total Current Assets	0	0.782	0.184	0	0	0
Total Assets	0	0.252	0.122	0	0	0
Total Current Liabilities	0.001	0.089	0.07	0.191	0	0.002
Total Long Term Debt	0.068	0.005	0.519	0.025	0.053	0.637
Total Liabilities	0.003	0.004	0.367	0.663	0.077	0.05
Owners Equity	0	0.023	0.06	0	0	0

Independent Variables	R-Squared					
	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0.9549	0.9904	0.9846	0.9643	0.9551	0.9547
Cost of Sales	0.9415	0.9886	0.9814	0.9541	0.9428	0.9404
Net Income	0.4831	0.5953	0.5519	0.6413	0.6345	0.4916
Total Current Assets	0.9583	0.9917	0.9861	0.9657	0.9598	0.9592
Total Assets	0.9609	0.9944	0.9847	0.9763	0.9702	0.9693
Total Current Liabilities	0.9668	0.9866	0.9731	0.9801	0.977	0.9736
Total Long Term Debt	0.9089	0.9791	0.9058	0.9634	0.9573	0.9478
Total Liabilities	0.9639	0.9909	0.9719	0.9828	0.9802	0.9773
Owners Equity	0.9196	0.9827	0.9889	0.9378	0.9216	0.9218

Appendix B Cont. Dependent Variable: Environmental Cost

Independent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
	Adj. R-Squared					
Revenue	0.9499	0.988	0.9807	0.9583	0.9486	0.949
Cost of Sales	0.935	0.9587	0.9768	0.9464	0.9346	0.9329
Net Income	0.4255	0.4933	0.4391	0.5812	0.5821	0.4278
Total Current Assets	0.9537	0.9896	0.9826	0.9599	0.954	0.9541
Total Assets	0.9566	0.993	0.9809	0.9724	0.966	0.9654
Total Current Liabilities	0.9631	0.9832	0.9663	0.9767	0.9737	0.9703
Total Long Term Debt	0.8987	0.9738	0.882	0.9573	0.9512	0.9413
Total Liabilities	0.9599	0.9886	0.9648	0.98	0.9773	0.9745
Owners Equity	0.9106	0.9783	0.9862	0.9274	0.9104	0.912
	VIF					
Independent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	2.54	2.73	21.29	2.74	2.59	2.64
Cost of Sales	2.54	2.73	21.29	2.74	2.59	2.64
Net Income	2.54	2.73	21.29	2.74	2.59	2.64
Total Current Assets	2.54	2.73	21.29	2.74	2.59	2.64
Total Assets	2.54	2.73	21.29	2.74	2.59	2.64
Total Current Liabilities	2.54	2.73	21.29	2.74	2.59	2.64
Total Long Term Debt	2.54	2.73	21.29	2.74	2.59	2.64
Total Liabilities	2.54	2.73	21.29	2.74	2.59	2.64
Owners Equity	2.54	2.73	21.29	2.74	2.59	2.64
	Prob>Chi2					
Independent Variables	2001-2010	2001-2005	2006-2010	2001-2007	2001-2008	2001-2009
Revenue	0	0	0	0	0	0
Cost of Sales	0	0	0	0	0	0
Net Income	0	0	0	0	0	0
Total Current Assets	0	0	0	0	0	0
Total Assets	0	0	0	0	0	0
Total Current Liabilities	0	0	0	0	0	0
Total Long Term Debt	0	0	0	0	0	0
Total Liabilities	0	0	0	0	0	0
Owners Equity	0	0	0	0	0	0

Appendix C: Firm Specific Bi-Variate Causality Test Results

Independent	ENV	REV	ENV	NI	ENV	CA	ENV	TA	ENV	CL	ENV	LTD	ENV	TL	ENV	OE
Dependent	REV	ENV	NI	ENV	CA	ENV	TA	ENV	CL	ENV	LTD	ENV	TL	ENV	OE	ENV
1. Aica	○	○	×	×	○	○	○	○	○	○	○	○	○	○	○	×
2. Asahi Kasei	×	○	×	○	×	×	×	○	×	○	×	○	○	○	×	○
3. Asahi Organic	○	×	○	○	○	×	○	×	○	○	○	○	○	○	○	○
4. Central Glass	○	△	×	○	○	○	○	○	○	○	○	○	○	○	○	○
5. Daicel	×	○	○	△	○	×	○	×	○	△	○	○	○	×	○	○
6. Dic Corporation	○	×	○	×	×	×	×	×	○	×	×	×	×	○	○	×
7. Hitachi Chemical	○	×	○	○	○	○	○	○	×	×	○	×	○	○	○	○
8. Hokko Chemical	×	×	×	△	×	○	×	○	○	×	○	×	○	○	×	○
9. Kansai Paint	△	×	○	×	○	×	○	×	○	×	○	○	○	×	○	×
10. Kuraray Co	○	○	○	○	×	○	○	○	○	×	○	○	○	○	○	△
11. Kureha	×	×	×	×	×	×	×	○	×	○	×	○	×	×	×	○
12. Mitsubishi Chemical	×	×	×	×	×	○	△	○	×	○	○	○	×	○	×	×
13. Mitsui Chemical	×	○	×	×	×	○	×	○	×	○	○	○	×	○	×	○
14. Nippon Paint	○	○	×	○	○	×	○	×	○	×	○	×	○	×	○	○
15. NOF Corp	○	×	○	×	○	○	×	△	○	○	△	×	○	○	○	×
16. Sanyo Chemical	○	○	△	○	○	○	○	○	○	○	○	○	○	○	○	○
17. Sekisui Chemical	○	○	○	×	○	○	△	×	×	×	×	○	○	×	×	○
18. Sekisui Jushi	○	○	○	○	○	×	○	○	○	○	○	×	○	○	○	×
19. Shin-Etsu Chemical	○	○	○	○	×	○	○	○	×	×	×	○	×	○	○	×
20. Shin-Etsu Polymer	○	△	○	○	○	○	○	○	×	○	○	△	×	○	○	○
21. Showa Denko KK	○	○	×	○	○	○	○	○	×	○	○	×	×	○	○	○
22. Sumitomo Chemical	○	×	○	×	×	×	△	×	○	×	○	×	○	×	×	×
23. Taiyo Nippon Sanso	×	○	×	○	○	○	○	○	×	×	○	○	○	○	×	○
24. Toagosei	○	○	○	○	○	×	○	×	×	○	○	×	○	○	○	○
25. Tokuyama Corp	×	×	×	×	×	○	×	○	×	○	○	×	○	○	×	○
26. Tosoh Corp	×	○	×	×	×	○	×	○	△	○	△	○	△	○	×	○
27. Toyo Ink Sc Holdings	×	○	×	○	○	○	○	○	○	×	×	○	○	×	×	○
28. Ube Industries	×	×	×	×	○	×	○	○	○	○	○	○	○	△	×	△
29. Kaneka Corp	○	○	×	○	×	○	×	×	○	△	○	×	○	×	×	×
30. Nippon Kayaku	○	×	○	×	×	○	×	○	×	×	○	○	○	○	○	×
31. Nippon Shokubai	×	○	○	×	○	○	×	○	×	○	○	○	×	○	×	○

Appendix D: Environment as the Dependent Variable 2001-2010

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Dependent 2001-2010.log
  log type:  text
 opened on:   8 Jul 2012, 19:04:26

. edit

. *(12 variables, 310 observations pasted into data editor)

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2010
                delta:  1 unit

.
. xi: reg revtot env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  190.00
       Model |  85632311.9    31  2762332.64           Prob > F      =  0.0000
    Residual |  4041725.21   278  14538.5799           R-squared     =  0.9549
-------------+------------------------------           Adj R-squared =  0.9499
       Total |  89674037.1   309   290207.24           Root MSE      =  120.58

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   21.43409     2.3947     8.95   0.000     16.72004    26.14814
    _Ifirm_2 |   1096.004   59.51443    18.42   0.000     978.8474     1213.16
    _Ifirm_3 |  -274.8978   59.35331    -4.63   0.000    -391.7368   -158.0588
    _Ifirm_4 |    13.3345   54.70933     0.24   0.808    -94.36267    121.0317
    _Ifirm_5 |   129.3747   55.15933     2.35   0.020     20.79168    237.9577
    _Ifirm_6 |   646.6472    59.9364    10.79   0.000     528.6604     764.634
    _Ifirm_7 |   233.9381   59.35331     3.94   0.000     117.0991    350.7771
    _Ifirm_8 |  -33.67075   53.93702    -0.62   0.533    -139.8476     72.5061
    _Ifirm_9 |   47.82009   54.51211     0.88   0.381    -59.48885     155.129
   _Ifirm_10 |   174.8926   54.82505     3.19   0.002      66.9676    282.8175
   _Ifirm_11 |   .2484604   54.22932     0.00   0.996    -106.5038    107.0007
   _Ifirm_12 |   1598.673   86.44412    18.49   0.000     1428.505    1768.841
   _Ifirm_13 |   750.7564   73.84935    10.17   0.000     605.3814    896.1313
   _Ifirm_14 |    67.7703   54.31335     1.25   0.213    -39.14738     174.688
   _Ifirm_15 |   28.02863   54.00785     0.52   0.604    -78.28766    134.3449
   _Ifirm_16 |  -44.03014   54.33275    -0.81   0.418     -150.986    62.92573
   _Ifirm_17 |   580.0303   58.85843     9.85   0.000     464.1655    695.8951
   _Ifirm_18 |  -19.44883   53.92916    -0.36   0.719    -125.6102    86.71254
   _Ifirm_19 |   744.8257   57.46345    12.96   0.000     631.7069    857.9444
   _Ifirm_20 |   14.31195   53.95454     0.27   0.791    -91.89939    120.5233
   _Ifirm_21 |   577.6097   56.09786    10.30   0.000     467.1792    688.0403
   _Ifirm_22 |   703.4308    89.2164     7.88   0.000     527.8053    879.0564
   _Ifirm_23 |    167.571   55.07712     3.04   0.003      59.1498    275.9922
   _Ifirm_24 |  -41.84317   55.08415    -0.76   0.448    -150.2782    66.59185
```

```
    _Ifirm_25 |   31.36195   56.13465     0.56   0.577    -79.14103    141.8649
    _Ifirm_26 |   171.0548   66.12825     2.59   0.010     40.87907    301.2305
    _Ifirm_27 |    49.6925   54.92389     0.90   0.366    -58.42703     157.812
    _Ifirm_28 |   266.5539   59.74649     4.46   0.000     148.9409    384.1669
    _Ifirm_29 |   182.0591   56.58134     3.22   0.001     70.67678    293.4414
    _Ifirm_30 |   17.10305   54.01528     0.32   0.752    -89.22786     123.434
    _Ifirm_31 |   19.42794   55.33136     0.35   0.726    -89.49371    128.3496
        _cons |    63.5018   38.22869     1.66   0.098    -11.75267    138.7563
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |      7.75    0.129022
   _Ifirm_22 |      5.30    0.188744
   _Ifirm_12 |      4.97    0.201044
   _Ifirm_13 |      3.63    0.275467
   _Ifirm_26 |      2.91    0.343549
    _Ifirm_6 |      2.39    0.418197
   _Ifirm_28 |      2.38    0.420860
    _Ifirm_2 |      2.36    0.424148
    _Ifirm_3 |      2.34    0.426454
    _Ifirm_7 |      2.34    0.426454
   _Ifirm_17 |      2.31    0.433656
   _Ifirm_19 |      2.20    0.454966
   _Ifirm_29 |      2.13    0.469263
   _Ifirm_25 |      2.10    0.476761
   _Ifirm_21 |      2.09    0.477386
   _Ifirm_31 |      2.04    0.490704
    _Ifirm_5 |      2.03    0.493770
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of revtot

         chi2(1)      =   594.41
         Prob > chi2  =   0.0000

. xtgls revtot env i. firm

Cross-sectional time-series FGLS regression
```

```
Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   6567.99
Log likelihood             =  -1908.59          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   21.43409   2.267737     9.45   0.000     16.98941    25.87877
             |
        firm |
          2  |   1096.004   56.35907    19.45   0.000     985.5419    1206.465
          3  |  -274.8978   56.20649    -4.89   0.000    -385.0605   -164.7351
          4  |    13.3345   51.80873     0.26   0.797    -88.20874    114.8777
          5  |   129.3747   52.23488     2.48   0.013     26.99623    231.7532
          6  |   646.6472   56.75867    11.39   0.000     535.4022    757.8921
          7  |   233.9381   56.20649     4.16   0.000     123.7754    344.1008
          8  |  -33.67075   51.07736    -0.66   0.510    -133.7805    66.43904
          9  |   47.82009   51.62197     0.93   0.354     -53.3571    148.9973
         10  |   174.8926   51.91832     3.37   0.001     73.13454    276.6506
         11  |   .2484604   51.35417     0.00   0.996    -100.4039    100.9008
         12  |   1598.673     81.861    19.53   0.000     1438.229    1759.118
         13  |   750.7564   69.93397    10.74   0.000     613.6883    887.8244
         14  |    67.7703   51.43375     1.32   0.188    -33.03799    168.5786
         15  |   28.02863   51.14444     0.55   0.584    -72.21263    128.2699
         16  |  -44.03014   51.45212    -0.86   0.392    -144.8744    56.81416
         17  |   580.0303   55.73785    10.41   0.000     470.7861    689.2745
         18  |  -19.44883   51.06992    -0.38   0.703     -119.544    80.64637
         19  |   744.8257   54.41684    13.69   0.000     638.1706    851.4807
         20  |   14.31195   51.09396     0.28   0.779    -85.83036    114.4543
         21  |   577.6097   53.12365    10.87   0.000     473.4893    681.7302
         22  |   703.4308   84.48629     8.33   0.000     537.8408    869.0209
         23  |    167.571   52.15702     3.21   0.001      65.3451    269.7969
         24  |  -41.84317   52.16368    -0.80   0.422    -144.0821    60.39576
         25  |   31.36195   53.15849     0.59   0.555    -72.82677    135.5507
         26  |   171.0548   62.62224     2.73   0.006     48.31744    293.7921
         27  |    49.6925   52.01191     0.96   0.339    -52.24897     151.634
         28  |   266.5539   56.57883     4.71   0.000     155.6614    377.4463
         29  |   182.0591   53.58149     3.40   0.001     77.04128    287.0769
         30  |   17.10305   51.15148     0.33   0.738      -83.152    117.3581
         31  |   19.42794   52.39778     0.37   0.711    -83.26982    122.1257
             |
       _cons |    63.5018   36.20187     1.75   0.079    -7.452552    134.4562
------------------------------------------------------------------------------

.
. xi: reg cos env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  144.33
       Model |  45801087.6    31  1477454.44           Prob > F      =  0.0000
    Residual |   2845810.7   278  10236.7291           R-squared     =  0.9415
-------------+------------------------------           Adj R-squared =  0.9350
```

Total	48646898.3	309	157433.328	Root MSE	= 101.18

cos	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	17.31609	2.00942	8.62	0.000	13.36047	21.2717
_Ifirm_2	739.7874	49.93923	14.81	0.000	641.4803	838.0945
_Ifirm_3	-218.8792	49.80403	-4.39	0.000	-316.9201	-120.8383
_Ifirm_4	-8.137842	45.90722	-0.18	0.859	-98.50776	82.23208
_Ifirm_5	70.7755	46.28483	1.53	0.127	-20.33775	161.8888
_Ifirm_6	465.7958	50.29331	9.26	0.000	366.7917	564.7998
_Ifirm_7	135.1068	49.80403	2.71	0.007	37.06587	233.1477
_Ifirm_8	-20.95041	45.25916	-0.46	0.644	-110.0446	68.14379
_Ifirm_9	19.45885	45.74173	0.43	0.671	-70.5853	109.503
_Ifirm_10	94.42866	46.00432	2.05	0.041	3.867584	184.9897
_Ifirm_11	-9.987525	45.50444	-0.22	0.826	-99.56456	79.58951
_Ifirm_12	1141.756	72.53625	15.74	0.000	998.9663	1284.546
_Ifirm_13	569.3392	61.96783	9.19	0.000	447.3534	691.3249
_Ifirm_14	30.5316	45.57495	0.67	0.503	-59.18424	120.2474
_Ifirm_15	16.39383	45.3186	0.36	0.718	-72.81737	105.605
_Ifirm_16	-36.63724	45.59123	-0.80	0.422	-126.3851	53.11064
_Ifirm_17	373.6803	49.38878	7.57	0.000	276.4569	470.9038
_Ifirm_18	-14.99518	45.25257	-0.33	0.741	-104.0764	74.08603
_Ifirm_19	434.6727	48.21824	9.01	0.000	339.7535	529.5919
_Ifirm_20	10.62041	45.27387	0.23	0.815	-78.50273	99.74356
_Ifirm_21	458.0856	47.07236	9.73	0.000	365.4221	550.7492
_Ifirm_22	398.3314	74.8625	5.32	0.000	250.962	545.7007
_Ifirm_23	89.77951	46.21584	1.94	0.053	-1.197936	180.757
_Ifirm_24	-46.19604	46.22174	-1.00	0.318	-137.1851	44.79302
_Ifirm_25	-16.3788	47.10323	-0.35	0.728	-109.1031	76.3455
_Ifirm_26	110.2069	55.48897	1.99	0.048	.974978	219.4388
_Ifirm_27	32.13127	46.08726	0.70	0.486	-58.59306	122.8556
_Ifirm_28	192.9624	50.13396	3.85	0.000	94.27198	291.6528
_Ifirm_29	102.229	47.47805	2.15	0.032	8.766857	195.6912
_Ifirm_30	-8.37133	45.32484	-0.18	0.854	-97.59481	80.85215
_Ifirm_31	8.281137	46.42917	0.18	0.859	-83.11626	99.67854
_cons	42.55512	32.07813	1.33	0.186	-20.59177	105.702

. vif

Variable	VIF	1/VIF
env	7.75	0.129022
_Ifirm_22	5.30	0.188744
_Ifirm_12	4.97	0.201044
_Ifirm_13	3.63	0.275467
_Ifirm_26	2.91	0.343549
_Ifirm_6	2.39	0.418197
_Ifirm_28	2.38	0.420860
_Ifirm_2	2.36	0.424148
_Ifirm_3	2.34	0.426454
_Ifirm_7	2.34	0.426454
_Ifirm_17	2.31	0.433656
_Ifirm_19	2.20	0.454966
_Ifirm_29	2.13	0.469263
_Ifirm_25	2.10	0.476761
_Ifirm_21	2.09	0.477386
_Ifirm_31	2.04	0.490704
_Ifirm_5	2.03	0.493770

```
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of cos

         chi2(1)      =   730.96
         Prob > chi2  =   0.0000

. xtgls cos env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   4989.21
Log likelihood             = -1854.213          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         cos |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   17.31609   1.902884     9.10   0.000      13.5865    21.04567
             |
        firm |
          2  |   739.7874   47.29154    15.64   0.000     647.0977    832.4771
          3  |  -218.8792   47.16351    -4.64   0.000     -311.318   -126.4404
          4  |  -8.137842   43.47329    -0.19   0.852    -93.34393    77.06824
          5  |    70.7755   43.83088     1.61   0.106    -15.13144    156.6824
          6  |   465.7958   47.62684     9.78   0.000     372.4489    559.1426
          7  |   135.1068   47.16351     2.86   0.004     42.66803    227.5456
          8  |  -20.95041    42.8596    -0.49   0.625    -104.9537    63.05286
          9  |   19.45885   43.31658     0.45   0.653    -65.44008    104.3578
         10  |   94.42866   43.56525     2.17   0.030     9.042339     179.815
         11  |  -9.987525   43.09187    -0.23   0.817    -94.44603    74.47098
         12  |   1141.756   68.69049    16.62   0.000     1007.126    1276.387
         13  |   569.3392   58.68239     9.70   0.000     454.3238    684.3545
         14  |    30.5316   43.15864     0.71   0.479    -54.05778     115.121
         15  |   16.39383   42.91588     0.38   0.702    -67.71975    100.5074
```

```
          16 |  -36.63724   43.17406    -0.85   0.396    -121.2568    47.98235
          17 |   373.6803   46.77027     7.99   0.000     282.0123    465.3484
          18 |  -14.99518   42.85335    -0.35   0.726    -98.98621    68.99584
          19 |   434.6727   45.66179     9.52   0.000     345.1772    524.1682
          20 |   10.62041   42.87352     0.25   0.804    -73.41014    94.65097
          21 |   458.0856   44.57666    10.28   0.000      370.717    545.4543
          22 |   398.3314   70.89341     5.62   0.000     259.3828    537.2799
          23 |   89.77951   43.76555     2.05   0.040     4.000611    175.5584
          24 |  -46.19604   43.77114    -1.06   0.291    -131.9859    39.59381
          25 |   -16.3788   44.60589    -0.37   0.713    -103.8047    71.04714
          26 |   110.2069   52.54703     2.10   0.036     7.216605    213.1972
          27 |   32.13127   43.64379     0.74   0.462    -53.40898    117.6715
          28 |   192.9624   47.47594     4.06   0.000     99.91125    286.0135
          29 |    102.229   44.96084     2.27   0.023     14.10738    190.3506
          30 |   -8.37133   42.92179    -0.20   0.845    -92.49649    75.75383
          31 |   8.281137   43.96757     0.19   0.851    -77.89372    94.45599
             |
       _cons |   42.55512    30.3774     1.40   0.161    -16.98349    102.0937
------------------------------------------------------------------------------

.
. xi: reg ni env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =    8.38
       Model |  119626.689    31  3858.92546           Prob > F      =  0.0000
    Residual |  127975.966   278  460.345203           R-squared     =  0.4831
-------------+------------------------------           Adj R-squared =  0.4255
       Total |  247602.656   309  801.303093           Root MSE      =  21.456

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   .9594936     .42612     2.25   0.025     .1206618    1.798325
    _Ifirm_2 |   12.64419   10.59017     1.19   0.234    -8.202923    33.49131
    _Ifirm_3 |  -14.66369    10.5615    -1.39   0.166    -35.45436    6.126991
    _Ifirm_4 |   -1.39959    9.73514    -0.14   0.886    -20.56354    17.76436
    _Ifirm_5 |  -1.233684   9.815215    -0.13   0.900    -20.55527     18.0879
    _Ifirm_6 |  -5.068502   10.66526    -0.48   0.635    -26.06343    15.92642
    _Ifirm_7 |   4.041813    10.5615     0.38   0.702    -16.74886    24.83249
    _Ifirm_8 |  -4.067518   9.597712    -0.42   0.672    -22.96094    14.82591
    _Ifirm_9 |   1.352466   9.700046     0.14   0.889     -17.7424    20.44734
   _Ifirm_10 |   5.881711   9.755732     0.60   0.547    -13.32278     25.0862
   _Ifirm_11 |  -3.572979   9.649725    -0.37   0.711    -22.56879    15.42283
   _Ifirm_12 |   4.558245   15.38212     0.30   0.767    -25.72199    34.83848
   _Ifirm_13 |    -16.903   13.14097    -1.29   0.199    -42.77145    8.965449
   _Ifirm_14 |  -1.770086   9.664679    -0.18   0.855    -20.79533    17.25516
   _Ifirm_15 |  -1.569985   9.610317    -0.16   0.870    -20.48822    17.34825
   _Ifirm_16 |  -5.049276   9.668131    -0.52   0.602    -24.08132    13.98277
   _Ifirm_17 |  -11.45213   10.47344    -1.09   0.275    -32.06946    9.165194
   _Ifirm_18 |  -2.432709   9.596314    -0.25   0.800    -21.32338    16.45796
   _Ifirm_19 |    93.7095   10.22522     9.16   0.000     73.58081    113.8382
   _Ifirm_20 |  -.4207816    9.60083    -0.04   0.965    -19.32034    18.47878
   _Ifirm_21 |   -5.91336    9.98222    -0.59   0.554     -25.5637    13.73698
   _Ifirm_22 |    6.40156   15.87543     0.40   0.687    -24.84977    37.65289
   _Ifirm_23 |     2.0495   9.800586     0.21   0.835    -17.24329    21.34229
   _Ifirm_24 |  -4.443317   9.801837    -0.45   0.651    -23.73857    14.85193
   _Ifirm_25 |  -3.341913   9.988767    -0.33   0.738    -23.00514    16.32131
   _Ifirm_26 |   -8.76122   11.76706    -0.74   0.457    -31.92507    14.40263
```

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    _Ifirm_27 |  -5.355969   9.773319    -0.55   0.584    -24.59508    13.88314
    _Ifirm_28 |  -5.709411   10.63147    -0.54   0.592    -26.63781    15.21899
    _Ifirm_29 |   2.825501   10.06825     0.28   0.779     -16.9942     22.6452
    _Ifirm_30 |  -.5165853   9.611639    -0.05   0.957    -19.43742    18.40425
    _Ifirm_31 |  -1.773797   9.845826    -0.18   0.857    -21.15564    17.60805
        _cons |   3.753354   6.802526     0.55   0.582     -9.63765    17.14436
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      7.75    0.129022
   _Ifirm_22 |      5.30    0.188744
   _Ifirm_12 |      4.97    0.201044
   _Ifirm_13 |      3.63    0.275467
   _Ifirm_26 |      2.91    0.343549
    _Ifirm_6 |      2.39    0.418197
   _Ifirm_28 |      2.38    0.420860
    _Ifirm_2 |      2.36    0.424148
    _Ifirm_3 |      2.34    0.426454
    _Ifirm_7 |      2.34    0.426454
   _Ifirm_17 |      2.31    0.433656
   _Ifirm_19 |      2.20    0.454966
   _Ifirm_29 |      2.13    0.469263
   _Ifirm_25 |      2.10    0.476761
   _Ifirm_21 |      2.09    0.477386
   _Ifirm_31 |      2.04    0.490704
    _Ifirm_5 |      2.03    0.493770
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of ni

         chi2(1)      =   239.75
         Prob > chi2  =   0.0000

. xtgls ni env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
```

```
Panels:         homoskedastic
Correlation:    no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =    289.78
Log likelihood             =  -1373.44          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   .9594936   .4035278     2.38   0.017     .1685936    1.750394
             |
        firm |
          2  |   12.64419    10.0287     1.26   0.207    -7.011697    32.30008
          3  |  -14.66369   10.00155    -1.47   0.143    -34.26636     4.93899
          4  |   -1.39959   9.218998    -0.15   0.879    -19.46849    16.66931
          5  |  -1.233684   9.294829    -0.13   0.894    -19.45121    16.98385
          6  |  -5.068502   10.09981    -0.50   0.616    -24.86376    14.72675
          7  |   4.041813   10.00155     0.40   0.686    -15.56086    23.64449
          8  |  -4.067518   9.088857    -0.45   0.654    -21.88135    13.74632
          9  |   1.352466   9.185766     0.15   0.883     -16.6513    19.35624
         10  |   5.881711   9.238499     0.64   0.524    -12.22541    23.98884
         11  |  -3.572979   9.138113    -0.39   0.696    -21.48335    14.33739
         12  |   4.558245   14.56659     0.31   0.754    -23.99174    33.10823
         13  |    -16.903   12.44426    -1.36   0.174     -41.2933    7.487298
         14  |  -1.770086   9.152273    -0.19   0.847    -19.70821    16.16804
         15  |  -1.569985   9.100793    -0.17   0.863    -19.40721    16.26724
         16  |  -5.049276   9.155542    -0.55   0.581    -22.99381    12.89526
         17  |  -11.45213   9.918158    -1.15   0.248    -30.89137    7.987098
         18  |  -2.432709   9.087533    -0.27   0.789    -20.24395    15.37853
         19  |    93.7095   9.683093     9.68   0.000     74.73098     112.688
         20  |  -.4207816    9.09181    -0.05   0.963     -18.2404    17.39884
         21  |   -5.91336   9.452979    -0.63   0.532    -24.44086    12.61414
         22  |    6.40156   15.03374     0.43   0.670    -23.06403    35.86715
         23  |     2.0495   9.280975     0.22   0.825    -16.14088    20.23988
         24  |  -4.443317    9.28216    -0.48   0.632    -22.63602    13.74938
         25  |  -3.341913   9.459179    -0.35   0.724    -21.88156    15.19774
         26  |   -8.76122   11.14319    -0.79   0.432    -30.60146    13.07902
         27  |  -5.355969   9.255153    -0.58   0.563    -23.49574     12.7838
         28  |  -5.709411    10.0678    -0.57   0.571    -25.44194    14.02312
         29  |   2.825501    9.53445     0.30   0.767    -15.86168    21.51268
         30  |  -.5165853   9.102045    -0.06   0.955    -18.35627     17.3231
         31  |  -1.773797   9.323816    -0.19   0.849    -20.04814    16.50055
             |
       _cons |   3.753354   6.441867     0.58   0.560    -8.872474    16.37918
------------------------------------------------------------------------------

.
. xi: reg curra env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  206.22
       Model |  20848077.4    31  672518.626           Prob > F      =  0.0000
    Residual |   906594.05   278  3261.12967           R-squared     =  0.9583
-------------+------------------------------           Adj R-squared =  0.9537
       Total |  21754671.4   309  70403.4674           Root MSE      =  57.106
```

curra	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	8.736856	1.13416	7.70	0.000	6.504224	10.96949
_Ifirm_2	486.4426	28.18677	17.26	0.000	430.956	541.9292
_Ifirm_3	-117.8173	28.11046	-4.19	0.000	-173.1537	-62.4809
_Ifirm_4	6.681545	25.91101	0.26	0.797	-44.32517	57.68826
_Ifirm_5	74.58258	26.12414	2.85	0.005	23.15632	126.0088
_Ifirm_6	259.842	28.38662	9.15	0.000	203.9619	315.722
_Ifirm_7	89.8275	28.11046	3.20	0.002	34.49111	145.1639
_Ifirm_8	-20.04544	25.54524	-0.78	0.433	-70.33211	30.24123
_Ifirm_9	39.81559	25.81761	1.54	0.124	-11.00726	90.63843
_Ifirm_10	113.4778	25.96582	4.37	0.000	62.3632	164.5924
_Ifirm_11	-6.071771	25.68368	-0.24	0.813	-56.63096	44.48742
_Ifirm_12	771.9424	40.94101	18.85	0.000	691.3487	852.5362
_Ifirm_13	324.7541	34.97596	9.29	0.000	255.9028	393.6055
_Ifirm_14	49.42184	25.72348	1.92	0.056	-1.215695	100.0594
_Ifirm_15	6.366661	25.57879	0.25	0.804	-43.98605	56.71937
_Ifirm_16	-16.93125	25.73266	-0.66	0.511	-67.58688	33.72437
_Ifirm_17	169.4583	27.87608	6.08	0.000	114.5833	224.3333
_Ifirm_18	-4.45146	25.54152	-0.17	0.862	-54.7308	45.82788
_Ifirm_19	701.1671	27.2154	25.76	0.000	647.5927	754.7416
_Ifirm_20	10.95168	25.55354	0.43	0.669	-39.35133	61.25469
_Ifirm_21	201.5034	26.56864	7.58	0.000	149.2021	253.8047
_Ifirm_22	480.6899	42.25399	11.38	0.000	397.5115	563.8683
_Ifirm_23	65.97126	26.08521	2.53	0.012	14.62164	117.3209
_Ifirm_24	-17.17295	26.08854	-0.66	0.511	-68.52912	34.18321
_Ifirm_25	39.27161	26.58607	1.48	0.141	-13.06397	91.60718
_Ifirm_26	98.62775	31.31916	3.15	0.002	36.97493	160.2806
_Ifirm_27	47.81821	26.01263	1.84	0.067	-3.388543	99.02496
_Ifirm_28	132.0066	28.29668	4.67	0.000	76.30367	187.7096
_Ifirm_29	83.57579	26.79762	3.12	0.002	30.82376	136.3278
_Ifirm_30	36.01225	25.58231	1.41	0.160	-14.34739	86.37189
_Ifirm_31	22.26385	26.20562	0.85	0.396	-29.32279	73.8505
_cons	44.67273	18.10558	2.47	0.014	9.031281	80.31418

. vif

Variable	VIF	1/VIF
env	7.75	0.129022
_Ifirm_22	5.30	0.188744
_Ifirm_12	4.97	0.201044
_Ifirm_13	3.63	0.275467
_Ifirm_26	2.91	0.343549
_Ifirm_6	2.39	0.418197
_Ifirm_28	2.38	0.420860
_Ifirm_2	2.36	0.424148
_Ifirm_3	2.34	0.426454
_Ifirm_7	2.34	0.426454
_Ifirm_17	2.31	0.433656
_Ifirm_19	2.20	0.454966
_Ifirm_29	2.13	0.469263
_Ifirm_25	2.10	0.476761
_Ifirm_21	2.09	0.477386
_Ifirm_31	2.04	0.490704
_Ifirm_5	2.03	0.493770
_Ifirm_24	2.02	0.495118
_Ifirm_23	2.02	0.495245

```
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of curra

         chi2(1)      =   626.24
         Prob > chi2  =   0.0000

. xtgls curra env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   7128.77
Log likelihood             = -1676.907          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       curra |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   8.736856   1.074028     8.13   0.000     6.631799    10.84191
             |
        firm |
          2  |   486.4426   26.69235    18.22   0.000     434.1266    538.7587
          3  |  -117.8173   26.62009    -4.43   0.000    -169.9917   -65.64288
          4  |   6.681545   24.53725     0.27   0.785    -41.41059    54.77368
          5  |   74.58258   24.73908     3.01   0.003     26.09487    123.0703
          6  |    259.842   26.88161     9.67   0.000      207.155    312.5289
          7  |    89.8275   26.62009     3.37   0.001     37.65309    142.0019
          8  |  -20.04544   24.19087    -0.83   0.407    -67.45868     27.3678
          9  |   39.81559    24.4488     1.63   0.103    -8.103185    87.73436
         10  |   113.4778   24.58916     4.61   0.000     65.28394    161.6717
         11  |  -6.071771   24.32197    -0.25   0.803    -53.74195    41.59841
         12  |   771.9424   38.77038    19.91   0.000     695.9539     847.931
         13  |   324.7541    33.1216     9.80   0.000      259.837    389.6713
         14  |   49.42184   24.35966     2.03   0.042     1.677787    97.16589
         15  |   6.366661   24.22264     0.26   0.793    -41.10884    53.84216
         16  |  -16.93125   24.36836    -0.69   0.487    -64.69236    30.82985
         17  |   169.4583   26.39814     6.42   0.000     117.7189    221.1977
```

```
          18 |   -4.45146   24.18735    -0.18   0.854    -51.85779    42.95487
          19 |   701.1671   25.77249    27.21   0.000      650.654    751.6803
          20 |   10.95168   24.19873     0.45   0.651    -36.47696    58.38032
          21 |   201.5034   25.16002     8.01   0.000     152.1907    250.8161
          22 |   480.6899   40.01375    12.01   0.000     402.2644    559.1154
          23 |   65.97126   24.70221     2.67   0.008     17.55581    114.3867
          24 |  -17.17295   24.70536    -0.70   0.487    -65.59458    31.24867
          25 |   39.27161   25.17652     1.56   0.119    -10.07346    88.61667
          26 |   98.62775   29.65867     3.33   0.001     40.49783    156.7577
          27 |   47.81821   24.63348     1.94   0.052    -.4625358    96.09895
          28 |   132.0066   26.79643     4.93   0.000      79.4866    184.5267
          29 |   83.57579   25.37686     3.29   0.001     33.83807    133.3135
          30 |   36.01225   24.22597     1.49   0.137    -11.46978    83.49428
          31 |   22.26385   24.81624     0.90   0.370    -26.37508    70.90278
             |
       _cons |   44.67273   17.14565     2.61   0.009     11.06787    78.27759
------------------------------------------------------------------------------

.
. xi: reg asset env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  220.64
       Model |   101694964    31   3280482.7           Prob > F      =  0.0000
    Residual |  4133221.34   278  14867.7026           R-squared     =  0.9609
-------------+------------------------------           Adj R-squared =  0.9566
       Total |   105828185   309  342486.035           Root MSE      =  121.93

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   15.45428   2.421654     6.38   0.000     10.68718    20.22139
    _Ifirm_2 |   1074.347    60.1843    17.85   0.000     955.8725    1192.822
    _Ifirm_3 |  -183.2343   60.02136    -3.05   0.002    -301.3884   -65.08019
    _Ifirm_4 |   89.06146   55.32511     1.61   0.109     -19.8479    197.9708
    _Ifirm_5 |   289.6518   55.78019     5.19   0.000     179.8466     399.457
    _Ifirm_6 |   724.3969   60.61102    11.95   0.000     605.0821    843.7118
    _Ifirm_7 |   187.3702   60.02136     3.12   0.002     69.21612    305.5243
    _Ifirm_8 |  -29.35927   54.54411    -0.54   0.591    -136.7312    78.01266
    _Ifirm_9 |   107.1328   55.12568     1.94   0.053     -1.38397    215.6496
   _Ifirm_10 |   330.5499   55.44214     5.96   0.000     221.4101    439.6896
   _Ifirm_11 |   65.82304    54.8397     1.20   0.231    -42.13078    173.7769
   _Ifirm_12 |   1849.337    87.4171    21.16   0.000     1677.253     2021.42
   _Ifirm_13 |   889.2778   74.68057    11.91   0.000     742.2666    1036.289
   _Ifirm_14 |   124.6524   54.92468     2.27   0.024     16.53129    232.7735
   _Ifirm_15 |   79.38774   54.61574     1.45   0.147     -28.1252    186.9007
   _Ifirm_16 |   4.368106    54.9443     0.08   0.937    -103.7916    112.5278
   _Ifirm_17 |   566.3979   59.52092     9.52   0.000      449.229    683.5669
   _Ifirm_18 |   4.029802   54.53616     0.07   0.941    -103.3265    111.3861
   _Ifirm_19 |   1354.448   58.11024    23.31   0.000     1240.056     1468.84
   _Ifirm_20 |   19.77895   54.56183     0.36   0.717    -87.62786    127.1858
   _Ifirm_21 |   799.5998   56.72928    14.10   0.000     687.9263    911.2733
   _Ifirm_22 |   1340.719   90.22059    14.86   0.000     1163.116    1518.321
   _Ifirm_23 |   269.0537   55.69705     4.83   0.000     159.4122    378.6952
   _Ifirm_24 |   22.50425   55.70416     0.40   0.687    -87.15127    132.1598
   _Ifirm_25 |   181.6995   56.76648     3.20   0.002     69.95273    293.4462
   _Ifirm_26 |   327.4539   66.87257     4.90   0.000     195.8129    459.0948
   _Ifirm_27 |   132.7348   55.54209     2.39   0.018      23.3983    242.0713
   _Ifirm_28 |   475.6322   60.41897     7.87   0.000     356.6954     594.569
```

```
   _Ifirm_29 |    225.758    57.2182      3.95   0.000     113.1221     338.394
   _Ifirm_30 |   91.44467   54.62325      1.67   0.095    -16.08306    198.9724
   _Ifirm_31 |   112.3009   55.95414      2.01   0.046     2.153299    222.4486
       _cons |   62.78469   38.65898      1.62   0.105    -13.31682    138.8862
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      7.75    0.129022
   _Ifirm_22 |      5.30    0.188744
   _Ifirm_12 |      4.97    0.201044
   _Ifirm_13 |      3.63    0.275467
   _Ifirm_26 |      2.91    0.343549
    _Ifirm_6 |      2.39    0.418197
   _Ifirm_28 |      2.38    0.420860
    _Ifirm_2 |      2.36    0.424148
    _Ifirm_3 |      2.34    0.426454
    _Ifirm_7 |      2.34    0.426454
   _Ifirm_17 |      2.31    0.433656
   _Ifirm_19 |      2.20    0.454966
   _Ifirm_29 |      2.13    0.469263
   _Ifirm_25 |      2.10    0.476761
   _Ifirm_21 |      2.09    0.477386
   _Ifirm_31 |      2.04    0.490704
    _Ifirm_5 |      2.03    0.493770
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of asset

         chi2(1)      =   709.08
         Prob > chi2  =   0.0000

. xtgls asset env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   7627.33
Log likelihood             =  -1912.06          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   15.45428   2.293262     6.74   0.000     10.95957    19.94899
             |
        firm |
          2  |   1074.347   56.99342    18.85   0.000     962.6423    1186.052
          3  |  -183.2343   56.83913    -3.22   0.001    -294.6369   -71.83164
          4  |   89.06146   52.39186     1.70   0.089    -13.62471    191.7476
          5  |   289.6518   52.82281     5.48   0.000      186.121    393.1826
          6  |   724.3969   57.39752    12.62   0.000     611.8998     836.894
          7  |   187.3702   56.83913     3.30   0.001     75.96757    298.7729
          8  |  -29.35927   51.65227    -0.57   0.570    -130.5959    71.87732
          9  |   107.1328     52.203     2.05   0.040     4.816792    209.4488
         10  |   330.5499   52.50269     6.30   0.000     227.6465    433.4532
         11  |   65.82304   51.93219     1.27   0.205    -35.96218    167.6083
         12  |   1849.337   82.78239    22.34   0.000     1687.086    2011.587
         13  |   889.2778   70.72112    12.57   0.000      750.667    1027.889
         14  |   124.6524   52.01266     2.40   0.017     22.70945    226.5953
         15  |   79.38774    51.7201     1.53   0.125     -21.9818    180.7573
         16  |   4.368106   52.03124     0.08   0.933    -97.61125    106.3475
         17  |   566.3979   56.36521    10.05   0.000     455.9241    676.8717
         18  |   4.029802   51.64474     0.08   0.938    -97.19203    105.2516
         19  |   1354.448   55.02933    24.61   0.000     1246.592    1462.303
         20  |   19.77895   51.66905     0.38   0.702    -81.49052    121.0484
         21  |   799.5998   53.72158    14.88   0.000     694.3074    904.8922
         22  |   1340.719   85.43724    15.69   0.000     1173.265    1508.173
         23  |   269.0537   52.74408     5.10   0.000     165.6772    372.4302
         24  |   22.50425   52.75081     0.43   0.670    -80.88544    125.8939
         25  |   181.6995   53.75682     3.38   0.001     76.33805    287.0609
         26  |   327.4539   63.32709     5.17   0.000      203.335    451.5727
         27  |   132.7348   52.59734     2.52   0.012      29.6459    235.8237
         28  |   475.6322   57.21565     8.31   0.000     363.4916    587.7728
         29  |    225.758   54.18459     4.17   0.000     119.5582    331.9579
         30  |   91.44467   51.72722     1.77   0.077    -9.938815    192.8282
         31  |   112.3009   52.98755     2.12   0.034      8.44725    216.1546
             |
       _cons |   62.78469   36.60934     1.71   0.086    -8.968297    134.5377
------------------------------------------------------------------------------

.
. xi: reg currl env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  261.42
       Model |  14702413.3    31  474271.397           Prob > F      =  0.0000
    Residual |  504341.937   278  1814.17963           R-squared     =  0.9668
-------------+------------------------------           Adj R-squared =  0.9631
       Total |  15206755.3   309  49212.8002           Root MSE      =  42.593

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
         env |   2.904093   .8459219     3.43   0.001     1.238867    4.569319
    _Ifirm_2 |    381.695   21.02333    18.16   0.000     340.3099    423.0802
    _Ifirm_3 |  -42.43802   20.96641    -2.02   0.044    -83.71111   -1.164932
    _Ifirm_4 |    44.5568   19.32593     2.31   0.022     6.513036    82.60055
    _Ifirm_5 |   91.49915    19.4849     4.70   0.000     53.14247    129.8558
    _Ifirm_6 |   362.9538   21.17239    17.14   0.000     321.2753    404.6324
    _Ifirm_7 |   100.5009   20.96641     4.79   0.000     59.22779     141.774
    _Ifirm_8 |  -1.076417   19.05312    -0.06   0.955    -38.58313    36.43029
    _Ifirm_9 |   36.73253   19.25627     1.91   0.057    -1.174088    74.63915
   _Ifirm_10 |   54.47791   19.36681     2.81   0.005     16.35368    92.60215
   _Ifirm_11 |   31.34343   19.15637     1.64   0.103    -6.366545     69.0534
   _Ifirm_12 |   888.1697   30.53617    29.09   0.000     828.0582    948.2812
   _Ifirm_13 |   394.5857    26.0871    15.13   0.000     343.2324    445.9391
   _Ifirm_14 |   65.02764   19.18606     3.39   0.001     27.25924    102.7961
   _Ifirm_15 |   31.53663   19.07814     1.65   0.099    -6.019341    69.09259
   _Ifirm_16 |  -1.158541   19.19291    -0.06   0.952    -38.94044    36.62336
   _Ifirm_17 |   256.9972    20.7916    12.36   0.000     216.0682    297.9261
   _Ifirm_18 |   5.311915   19.05034     0.28   0.781    -32.18933    42.81316
   _Ifirm_19 |   276.1646   20.29882    13.60   0.000     236.2057    316.1235
   _Ifirm_20 |   9.805508   19.05931     0.51   0.607    -27.71339     47.3244
   _Ifirm_21 |   353.3099   19.81643    17.83   0.000     314.3006    392.3192
   _Ifirm_22 |   520.2865   31.51547    16.51   0.000     458.2472    582.3258
   _Ifirm_23 |   94.06005   19.45586     4.83   0.000     55.76054    132.3596
   _Ifirm_24 |   11.20233   19.45834     0.58   0.565    -27.10207    49.50674
   _Ifirm_25 |   60.05921   19.82943     3.03   0.003      21.0243    99.09411
   _Ifirm_26 |   233.1231   23.35964     9.98   0.000     187.1389    279.1074
   _Ifirm_27 |   55.80917   19.40173     2.88   0.004     17.61621    94.00213
   _Ifirm_28 |   266.3795    21.1053    12.62   0.000      224.833     307.926
   _Ifirm_29 |    76.9666   19.98722     3.85   0.000     37.62107    116.3121
   _Ifirm_30 |   12.98943   19.08076     0.68   0.497     -24.5717    50.55057
   _Ifirm_31 |   39.77335   19.54567     2.03   0.043     1.297042    78.24966
       _cons |   19.99673   13.50419     1.48   0.140    -6.586733    46.58018
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      7.75    0.129022
   _Ifirm_22 |      5.30    0.188744
   _Ifirm_12 |      4.97    0.201044
   _Ifirm_13 |      3.63    0.275467
   _Ifirm_26 |      2.91    0.343549
    _Ifirm_6 |      2.39    0.418197
   _Ifirm_28 |      2.38    0.420860
    _Ifirm_2 |      2.36    0.424148
    _Ifirm_3 |      2.34    0.426454
    _Ifirm_7 |      2.34    0.426454
   _Ifirm_17 |      2.31    0.433656
   _Ifirm_19 |      2.20    0.454966
   _Ifirm_29 |      2.13    0.469263
   _Ifirm_25 |      2.10    0.476761
   _Ifirm_21 |      2.09    0.477386
   _Ifirm_31 |      2.04    0.490704
    _Ifirm_5 |      2.03    0.493770
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
```

```
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of currl

         chi2(1)      =   361.28
         Prob > chi2  =   0.0000

. xtgls currl env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   9037.02
Log likelihood             = -1586.009          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.904093   .8010725     3.63   0.000      1.33402    4.474166
             |
        firm |
          2  |    381.695    19.9087    19.17   0.000     342.6747    420.7154
          3  |  -42.43802    19.8548    -2.14   0.033    -81.35272   -3.523319
          4  |    44.5568   18.30131     2.43   0.015     8.686896    80.42669
          5  |   91.49915   18.45184     4.96   0.000     55.33421    127.6641
          6  |   362.9538   20.04986    18.10   0.000     323.6568    402.2508
          7  |   100.5009    19.8548     5.06   0.000     61.58618    139.4156
          8  |  -1.076417   18.04295    -0.06   0.952    -36.43995    34.28712
          9  |   36.73253   18.23533     2.01   0.044     .9919363    72.47313
         10  |   54.47791   18.34002     2.97   0.003     18.53214    90.42369
         11  |   31.34343   18.14073     1.73   0.084    -4.211758    66.89861
         12  |   888.1697    28.9172    30.71   0.000      831.493    944.8464
         13  |   394.5857     24.704    15.97   0.000     346.1668    443.0047
         14  |   65.02764   18.16884     3.58   0.000     29.41736    100.6379
         15  |   31.53663   18.06665     1.75   0.081    -3.873353     66.9466
         16  |  -1.158541   18.17533    -0.06   0.949    -36.78154    34.46446
         17  |   256.9972   19.68926    13.05   0.000     218.4069    295.5874
         18  |   5.311915   18.04032     0.29   0.768    -30.04647     40.6703
         19  |   276.1646   19.22261    14.37   0.000      238.489    313.8402
```

```
          20 |   9.805508   18.04881     0.54   0.587    -25.56952    45.18053
          21 |   353.3099    18.7658    18.83   0.000     316.5296    390.0902
          22 |   520.2865   29.84458    17.43   0.000     461.7922    578.7808
          23 |   94.06005   18.42434     5.11   0.000     57.94901    130.1711
          24 |   11.20233   18.42669     0.61   0.543    -24.91332    47.31798
          25 |   60.05921    18.7781     3.20   0.001      23.2548    96.86361
          26 |   233.1231   22.12115    10.54   0.000     189.7665    276.4798
          27 |   55.80917   18.37308     3.04   0.002      19.7986    91.81975
          28 |   266.3795   19.98633    13.33   0.000      227.207     305.552
          29 |    76.9666   18.92753     4.07   0.000     39.86932    114.0639
          30 |   12.98943   18.06913     0.72   0.472    -22.42542    48.40428
          31 |   39.77335   18.50939     2.15   0.032     3.495619    76.05108
             |
       _cons |   19.99673   12.78822     1.56   0.118    -5.067726    45.06118
------------------------------------------------------------------------------

.
. xi: reg ltd env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   89.47
       Model |  4975948.13    31  160514.456           Prob > F      =  0.0000
    Residual |  498769.827   278  1794.13607           R-squared     =  0.9089
-------------+------------------------------           Adj R-squared =  0.8987
       Total |  5474717.96   309  17717.5339           Root MSE      =  42.357

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |    1.54051   .8412359     1.83   0.068    -.1154917    3.196511
    _Ifirm_2 |   157.6595   20.90687     7.54   0.000     116.5036    198.8154
    _Ifirm_3 |   -15.9146   20.85027    -0.76   0.446    -56.95906    25.12986
    _Ifirm_4 |   17.38603   19.21888     0.90   0.366    -20.44699    55.21904
    _Ifirm_5 |   75.59067   19.37696     3.90   0.000     37.44646    113.7349
    _Ifirm_6 |   295.7122    21.0551    14.04   0.000     254.2645    337.1599
    _Ifirm_7 |   7.683302   20.85027     0.37   0.713    -33.36116    48.72776
    _Ifirm_8 |    3.74672   18.94757     0.20   0.843    -33.55222    41.04566
    _Ifirm_9 |  -.4328271    19.1496    -0.02   0.982    -38.12946    37.26381
   _Ifirm_10 |   22.17428   19.25953     1.15   0.251    -15.73877    60.08732
   _Ifirm_11 |   13.27717   19.05026     0.70   0.486    -24.22391    50.77825
   _Ifirm_12 |   462.8596   30.36702    15.24   0.000     403.0811    522.6381
   _Ifirm_13 |   258.6416   25.94259     9.97   0.000     207.5727    309.7105
   _Ifirm_14 |   15.47383   19.07978     0.81   0.418    -22.08536    53.03302
   _Ifirm_15 |   19.58843   18.97246     1.03   0.303     -17.7595    56.93636
   _Ifirm_16 |   1.632867   19.08659     0.09   0.932    -35.93974    39.20547
   _Ifirm_17 |   66.57955   20.67642     3.22   0.001     25.87732    107.2818
   _Ifirm_18 |    3.40866   18.94481     0.18   0.857    -33.88485    40.70217
   _Ifirm_19 |   42.32858   20.18638     2.10   0.037     2.591003    82.06615
   _Ifirm_20 |   2.344831   18.95373     0.12   0.902    -34.96623    39.65589
   _Ifirm_21 |    247.736   19.70666    12.57   0.000     208.9428    286.5293
   _Ifirm_22 |   323.4699    31.3409    10.32   0.000     261.7743    385.1655
   _Ifirm_23 |   93.75349   19.34808     4.85   0.000     55.66613    131.8408
   _Ifirm_24 |   8.822101   19.35055     0.46   0.649    -29.27012    46.91432
   _Ifirm_25 |   62.15064   19.71958     3.15   0.002     23.33197    100.9693
   _Ifirm_26 |   135.0263   23.23024     5.81   0.000     89.29674    180.7558
   _Ifirm_27 |     38.741   19.29425     2.01   0.046     .7596139     76.7224
   _Ifirm_28 |   193.7426   20.98839     9.23   0.000     152.4263     235.059
   _Ifirm_29 |   27.71633    19.8765     1.39   0.164    -11.41124    66.84389
   _Ifirm_30 |   8.473681   18.97507     0.45   0.656    -28.87938    45.82675
```

```
   _Ifirm_31 |   27.42413   19.43739     1.41   0.159    -10.83904     65.6873
       _cons |  -1.569608   13.42938    -0.12   0.907    -28.00581    24.86659
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      7.75    0.129022
   _Ifirm_22 |      5.30    0.188744
   _Ifirm_12 |      4.97    0.201044
   _Ifirm_13 |      3.63    0.275467
   _Ifirm_26 |      2.91    0.343549
    _Ifirm_6 |      2.39    0.418197
   _Ifirm_28 |      2.38    0.420860
    _Ifirm_2 |      2.36    0.424148
    _Ifirm_3 |      2.34    0.426454
    _Ifirm_7 |      2.34    0.426454
   _Ifirm_17 |      2.31    0.433656
   _Ifirm_19 |      2.20    0.454966
   _Ifirm_29 |      2.13    0.469263
   _Ifirm_25 |      2.10    0.476761
   _Ifirm_21 |      2.09    0.477386
   _Ifirm_31 |      2.04    0.490704
    _Ifirm_5 |      2.03    0.493770
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of ltd

         chi2(1)      =   753.20
         Prob > chi2  =   0.0000

. xtgls ltd env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
```

```
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   3092.70
Log likelihood             = -1584.287          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |    1.54051   .7966349     1.93   0.053     -.020866    3.101886
             |
        firm |
          2  |   157.6595   19.79842     7.96   0.000     118.8553    196.4637
          3  |   -15.9146   19.74482    -0.81   0.420    -54.61373    22.78454
          4  |   17.38603   18.19993     0.96   0.339    -18.28517    53.05723
          5  |   75.59067   18.34963     4.12   0.000     39.62606    111.5553
          6  |   295.7122   19.93879    14.83   0.000     256.6329    334.7915
          7  |   7.683302   19.74482     0.39   0.697    -31.01583    46.38244
          8  |    3.74672     17.943     0.21   0.835    -31.42092    38.91436
          9  |  -.4328271   18.13432    -0.02   0.981    -35.97544    35.10978
         10  |   22.17428   18.23842     1.22   0.224    -13.57238    57.92093
         11  |   13.27717   18.04024     0.74   0.462    -22.08106     48.6354
         12  |   462.8596   28.75701    16.10   0.000     406.4969    519.2223
         13  |   258.6416   24.56716    10.53   0.000     210.4908    306.7923
         14  |   15.47383    18.0682     0.86   0.392    -19.93919    50.88684
         15  |   19.58843   17.96657     1.09   0.276     -15.6254    54.80226
         16  |   1.632867   18.07465     0.09   0.928     -33.7928    37.05853
         17  |   66.57955   19.58019     3.40   0.001     28.20308     104.956
         18  |    3.40866   17.94039     0.19   0.849    -31.75386    38.57118
         19  |   42.32858   19.11613     2.21   0.027      4.86165     79.7955
         20  |   2.344831   17.94883     0.13   0.896    -32.83424     37.5239
         21  |    247.736   18.66184    13.28   0.000     211.1595    284.3126
         22  |   323.4699   29.67925    10.90   0.000     265.2996    381.6402
         23  |   93.75349   18.32228     5.12   0.000     57.84248    129.6645
         24  |   8.822101   18.32462     0.48   0.630    -27.09349    44.73769
         25  |   62.15064   18.67408     3.33   0.001     25.55011    98.75117
         26  |   135.0263   21.99861     6.14   0.000     91.90978    178.1428
         27  |     38.741    18.2713     2.12   0.034      2.92991     74.5521
         28  |   193.7426   19.87562     9.75   0.000     154.7871    232.6981
         29  |   27.71633   18.82268     1.47   0.141    -9.175454     64.6081
         30  |   8.473681   17.96904     0.47   0.637    -26.74499    43.69235
         31  |   27.42413   18.40685     1.49   0.136    -8.652641     63.5009
             |
       _cons |  -1.569608   12.71738    -0.12   0.902    -26.49522      23.356
------------------------------------------------------------------------------

.
. xi: reg liab env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  239.77
       Model |  44274936.3    31  1428223.75           Prob > F      =  0.0000
    Residual |  1655928.94   278  5956.57893           R-squared     =  0.9639
-------------+------------------------------           Adj R-squared =  0.9599
       Total |  45930865.3   309  148643.577           Root MSE      =  77.179

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   4.633444   1.532811     3.02   0.003     1.616054    7.650834
```

_Ifirm_2	682.2588	38.09428	17.91	0.000	607.2689	757.2486
_Ifirm_3	-58.80959	37.99114	-1.55	0.123	-133.5964	15.97727
_Ifirm_4	82.9498	35.0186	2.37	0.019	14.01449	151.8851
_Ifirm_5	189.3825	35.30665	5.36	0.000	119.8802	258.8849
_Ifirm_6	725.714	38.36437	18.92	0.000	650.1924	801.2356
_Ifirm_7	135.6529	37.99114	3.57	0.000	60.86605	210.4398
_Ifirm_8	5.521923	34.52426	0.16	0.873	-62.44025	73.4841
_Ifirm_9	54.02466	34.89237	1.55	0.123	-14.66215	122.7115
_Ifirm_10	112.044	35.09268	3.19	0.002	42.96283	181.1251
_Ifirm_11	51.81719	34.71136	1.49	0.137	-16.5133	120.1477
_Ifirm_12	1496.002	55.33156	27.04	0.000	1387.08	1604.924
_Ifirm_13	715.255	47.26984	15.13	0.000	622.2027	808.3073
_Ifirm_14	94.51145	34.76515	2.72	0.007	26.07508	162.9478
_Ifirm_15	65.16276	34.5696	1.88	0.060	-2.888673	133.2142
_Ifirm_16	6.920573	34.77756	0.20	0.842	-61.54024	75.38139
_Ifirm_17	393.4498	37.67438	10.44	0.000	319.2865	467.6131
_Ifirm_18	12.54515	34.51923	0.36	0.717	-55.40712	80.49743
_Ifirm_19	366.6335	36.78148	9.97	0.000	294.2279	439.0391
_Ifirm_20	12.79264	34.53548	0.37	0.711	-55.19162	80.77689
_Ifirm_21	679.9635	35.90738	18.94	0.000	609.2786	750.6485
_Ifirm_22	971.308	57.10606	17.01	0.000	858.8928	1083.723
_Ifirm_23	217.7105	35.25402	6.18	0.000	148.3117	287.1092
_Ifirm_24	25.09683	35.25852	0.71	0.477	-44.31077	94.50443
_Ifirm_25	143.9887	35.93093	4.01	0.000	73.25744	214.72
_Ifirm_26	393.6711	42.32768	9.30	0.000	310.3476	476.9945
_Ifirm_27	97.68659	35.15594	2.78	0.006	28.48093	166.8922
_Ifirm_28	492.545	38.24281	12.88	0.000	417.2627	567.8272
_Ifirm_29	127.9099	36.21685	3.53	0.000	56.6158	199.204
_Ifirm_30	45.41736	34.57436	1.31	0.190	-22.64343	113.4782
_Ifirm_31	75.53788	35.41676	2.13	0.034	5.81879	145.257
_cons	19.39088	24.4696	0.79	0.429	-28.77836	67.56012

```
. vif
```

Variable	VIF	1/VIF
env	7.75	0.129022
_Ifirm_22	5.30	0.188744
_Ifirm_12	4.97	0.201044
_Ifirm_13	3.63	0.275467
_Ifirm_26	2.91	0.343549
_Ifirm_6	2.39	0.418197
_Ifirm_28	2.38	0.420860
_Ifirm_2	2.36	0.424148
_Ifirm_3	2.34	0.426454
_Ifirm_7	2.34	0.426454
_Ifirm_17	2.31	0.433656
_Ifirm_19	2.20	0.454966
_Ifirm_29	2.13	0.469263
_Ifirm_25	2.10	0.476761
_Ifirm_21	2.09	0.477386
_Ifirm_31	2.04	0.490704
_Ifirm_5	2.03	0.493770
_Ifirm_24	2.02	0.495118
_Ifirm_23	2.02	0.495245
_Ifirm_27	2.01	0.498012
_Ifirm_10	2.00	0.499809
_Ifirm_4	1.99	0.501926
_Ifirm_9	1.98	0.505564

```
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of liab

         chi2(1)      =   692.26
         Prob > chi2  =   0.0000

. xtgls liab env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   8288.54
Log likelihood             = -1770.283          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   4.633444   1.451544     3.19   0.001     1.788471    7.478417
             |
        firm |
          2  |   682.2588   36.07458    18.91   0.000     611.5539    752.9636
          3  |  -58.80959   35.97692    -1.63   0.102     -129.323    11.70387
          4  |    82.9498   33.16197     2.50   0.012     17.95353    147.9461
          5  |   189.3825   33.43475     5.66   0.000     123.8516    254.9134
          6  |    725.714   36.33036    19.98   0.000     654.5078    796.9202
          7  |   135.6529   35.97692     3.77   0.000     65.13945    206.1664
          8  |   5.521923   32.69384     0.17   0.866    -58.55682    69.60067
          9  |   54.02466   33.04243     1.64   0.102    -10.73731    118.7866
         10  |    112.044   33.23212     3.37   0.001     46.91019    177.1777
         11  |   51.81719   32.87102     1.58   0.115    -12.60882    116.2432
         12  |   1496.002   52.39797    28.55   0.000     1393.303      1598.7
         13  |    715.255   44.76367    15.98   0.000     627.5198    802.9902
         14  |   94.51145   32.92195     2.87   0.004     29.98561    159.0373
         15  |   65.16276   32.73677     1.99   0.047     .9998573    129.3257
         16  |   6.920573   32.93371     0.21   0.834    -57.62832    71.46947
         17  |   393.4498   35.67695    11.03   0.000     323.5242    463.3753
         18  |   12.54515   32.68907     0.38   0.701    -51.52426    76.61456
         19  |   366.6335   34.83138    10.53   0.000     298.3653    434.9018
         20  |   12.79264   32.70446     0.39   0.696    -51.30693     76.8922
         21  |   679.9635   34.00363    20.00   0.000     613.3177    746.6094
```

```
          22 |    971.308   54.07839    17.96   0.000     865.3164      1077.3
          23 |   217.7105   33.38491     6.52   0.000     152.2772    283.1437
          24 |   25.09683   33.38917     0.75   0.452    -40.34474    90.53841
          25 |   143.9887   34.02593     4.23   0.000      77.2991    210.6783
          26 |   393.6711   40.08354     9.82   0.000     315.1088    472.2333
          27 |   97.68659   33.29203     2.93   0.003     32.43541    162.9378
          28 |    492.545   36.21524    13.60   0.000     421.5644    563.5255
          29 |   127.9099   34.29669     3.73   0.000     60.68962    195.1302
          30 |   45.41736   32.74128     1.39   0.165    -18.75437    109.5891
          31 |   75.53788   33.53902     2.25   0.024     9.802612    141.2731
             |
       _cons |   19.39088   23.17226     0.84   0.403    -26.02592    64.80768
------------------------------------------------------------------------------

.
. xi: reg oe env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =  102.59
       Model |  18684125.8    31  602713.736           Prob > F      =  0.0000
    Residual |  1633315.71   278  5875.23635           R-squared     =  0.9196
-------------+------------------------------           Adj R-squared =  0.9106
       Total |  20317441.5   309  65752.2379           Root MSE      =   76.65

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   10.82084   1.522309     7.11   0.000     7.824123    13.81756
    _Ifirm_2 |   392.0886   37.83327    10.36   0.000     317.6125    466.5647
    _Ifirm_3 |  -124.4247   37.73085    -3.30   0.001    -198.6992   -50.15023
    _Ifirm_4 |    6.11166   34.77868     0.18   0.861    -62.35134    74.57467
    _Ifirm_5 |   100.2692   35.06475     2.86   0.005      31.2431    169.2954
    _Ifirm_6 |  -1.317089   38.10152    -0.03   0.972    -76.32123    73.68705
    _Ifirm_7 |   51.71731   37.73085     1.37   0.172    -22.55715    125.9918
    _Ifirm_8 |  -34.88119   34.28772    -1.02   0.310    -102.3777    32.61535
    _Ifirm_9 |   53.10814   34.65331     1.53   0.127    -15.10807    121.3243
   _Ifirm_10 |   218.5059   34.85224     6.27   0.000     149.8981    287.1137
   _Ifirm_11 |   14.00585   34.47353     0.41   0.685    -53.85647    81.86817
   _Ifirm_12 |   353.3353   54.95246     6.43   0.000     245.1595    461.5111
   _Ifirm_13 |   174.0228   46.94597     3.71   0.000     81.60809    266.4376
   _Ifirm_14 |   30.14095   34.52696     0.87   0.383    -37.82653    98.10844
   _Ifirm_15 |   14.22498   34.33275     0.41   0.679     -53.3602    81.81016
   _Ifirm_16 |  -2.552464   34.53929    -0.07   0.941    -70.54423     65.4393
   _Ifirm_17 |   172.9482   37.41626     4.62   0.000     99.29299    246.6033
   _Ifirm_18 |   -8.51535   34.28272    -0.25   0.804    -76.00205    58.97135
   _Ifirm_19 |   987.8142   36.52947    27.04   0.000     915.9047    1059.724
   _Ifirm_20 |   6.986319   34.29886     0.20   0.839    -60.53215    74.50479
   _Ifirm_21 |   119.6362   35.66137     3.35   0.001     49.43562    189.8368
   _Ifirm_22 |   369.4106    56.7148     6.51   0.000     257.7656    481.0556
   _Ifirm_23 |   51.34324   35.01248     1.47   0.144    -17.58002    120.2665
   _Ifirm_24 |  -2.592578   35.01695    -0.07   0.941    -71.52464    66.33948
   _Ifirm_25 |   37.71077   35.68476     1.06   0.292    -32.53588    107.9574
   _Ifirm_26 |   -66.2172   42.03768    -1.58   0.116    -148.9698     16.5354
   _Ifirm_27 |   35.04819   34.91507     1.00   0.316    -33.68331    103.7797
   _Ifirm_28 |  -16.91276    37.9808    -0.45   0.656    -91.67924    57.85373
   _Ifirm_29 |   97.84813   35.96872     2.72   0.007     27.04249    168.6538
   _Ifirm_30 |   46.02731   34.33747     1.34   0.181    -21.56717    113.6218
   _Ifirm_31 |   36.76306    35.1741     1.05   0.297    -32.47835    106.0045
       _cons |   43.39381   24.30195     1.79   0.075    -4.445403    91.23302
```

```
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      7.75    0.129022
   _Ifirm_22 |      5.30    0.188744
   _Ifirm_12 |      4.97    0.201044
   _Ifirm_13 |      3.63    0.275467
   _Ifirm_26 |      2.91    0.343549
    _Ifirm_6 |      2.39    0.418197
   _Ifirm_28 |      2.38    0.420860
    _Ifirm_2 |      2.36    0.424148
    _Ifirm_3 |      2.34    0.426454
    _Ifirm_7 |      2.34    0.426454
   _Ifirm_17 |      2.31    0.433656
   _Ifirm_19 |      2.20    0.454966
   _Ifirm_29 |      2.13    0.469263
   _Ifirm_25 |      2.10    0.476761
   _Ifirm_21 |      2.09    0.477386
   _Ifirm_31 |      2.04    0.490704
    _Ifirm_5 |      2.03    0.493770
   _Ifirm_24 |      2.02    0.495118
   _Ifirm_23 |      2.02    0.495245
   _Ifirm_27 |      2.01    0.498012
   _Ifirm_10 |      2.00    0.499809
    _Ifirm_4 |      1.99    0.501926
    _Ifirm_9 |      1.98    0.505564
   _Ifirm_16 |      1.96    0.508908
   _Ifirm_14 |      1.96    0.509271
   _Ifirm_11 |      1.96    0.510851
   _Ifirm_30 |      1.94    0.514907
   _Ifirm_15 |      1.94    0.515049
   _Ifirm_20 |      1.94    0.516067
    _Ifirm_8 |      1.94    0.516403
   _Ifirm_18 |      1.94    0.516553
-------------+----------------------
    Mean VIF |      2.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of oe

         chi2(1)      =   820.25
         Prob > chi2  =   0.0000

. xtgls oe env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
```

```
                                                  Wald chi2(31)      =   3546.21
Log likelihood             = -1768.151            Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   10.82084   1.441599     7.51   0.000     7.995359    13.64632
             |
        firm |
          2  |   392.0886   35.82742    10.94   0.000     321.8681     462.309
          3  |  -124.4247   35.73042    -3.48   0.000     -194.455   -54.39435
          4  |    6.11166   32.93477     0.19   0.853     -58.4393    70.66262
          5  |   100.2692   33.20567     3.02   0.003     35.18733    165.3512
          6  |  -1.317089   36.08144    -0.04   0.971    -72.03541    69.40124
          7  |   51.71731   35.73042     1.45   0.148    -18.31303    121.7476
          8  |  -34.88119   32.46984    -1.07   0.283    -98.52091    28.75852
          9  |   53.10814   32.81604     1.62   0.106    -11.21012    117.4264
         10  |   218.5059   33.00443     6.62   0.000     153.8184    283.1934
         11  |   14.00585    32.6458     0.43   0.668    -49.97875    77.99045
         12  |   353.3353   52.03897     6.79   0.000     251.3408    455.3298
         13  |   174.0228   44.45697     3.91   0.000     86.88877    261.1569
         14  |   30.14095   32.69639     0.92   0.357     -33.9428     94.2247
         15  |   14.22498   32.51248     0.44   0.662    -49.49831    77.94827
         16  |  -2.552464   32.70807    -0.08   0.938    -66.65911    61.55418
         17  |   172.9482   35.43251     4.88   0.000     103.5017    242.3946
         18  |   -8.51535   32.46511    -0.26   0.793    -72.14579    55.11509
         19  |   987.8142   34.59274    28.56   0.000     920.0136    1055.615
         20  |   6.986319   32.48039     0.22   0.830    -56.67407    70.64671
         21  |   119.6362   33.77066     3.54   0.000     53.44695    185.8255
         22  |   369.4106   53.70787     6.88   0.000     264.1451    474.6761
         23  |   51.34324   33.15618     1.55   0.121    -13.64167    116.3282
         24  |  -2.592578   33.16041    -0.08   0.938    -67.58579    62.40063
         25  |   37.71077   33.79281     1.12   0.264    -28.52191    103.9435
         26  |   -66.2172   39.80891    -1.66   0.096    -144.2412    11.80683
         27  |   35.04819   33.06393     1.06   0.289    -29.75592    99.85231
         28  |  -16.91276   35.96712    -0.47   0.638    -87.40701    53.58149
         29  |   97.84813   34.06171     2.87   0.004      31.0884    164.6079
         30  |   46.02731   32.51695     1.42   0.157    -17.70475    109.7594
         31  |   36.76306   33.30923     1.10   0.270    -28.52182    102.0479
             |
       _cons |   43.39381    23.0135     1.89   0.059     -1.71182    88.49944
------------------------------------------------------------------------------

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Dependent 2001-2010.log
  log type:  text
 closed on:   8 Jul 2012, 19:07:13
```

Appendix E: Environment as the Independent Variable 2001-2010

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Independent 2001-2010.log
  log type:  text
 opened on:   8 Jul 2012, 19:13:06

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2010
                delta:  1 unit

.
. xi: reg env revtot i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   80.57
       Model |  17681.5566    31  570.372795           Prob > F      =  0.0000
    Residual |  1968.08301   278  7.07943529           R-squared     =  0.8998
-------------+------------------------------           Adj R-squared =  0.8887
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.6607

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |   .0104371   .0011661     8.95   0.000     .0081417    .0127326
    _Ifirm_2 |  -3.275144   1.946842    -1.68   0.094    -7.107569    .5572806
    _Ifirm_3 |   10.90894   1.191509     9.16   0.000     8.563418    13.25447
    _Ifirm_4 |   2.856449    1.19517     2.39   0.018     .5037169    5.209181
    _Ifirm_5 |   2.413925   1.220615     1.98   0.049     .0111021    4.816747
    _Ifirm_6 |   1.733054    1.57191     1.10   0.271    -1.361304    4.827412
    _Ifirm_7 |   5.598151   1.303277     4.30   0.000     3.032605    8.163696
    _Ifirm_8 |  -.0437049   1.191046    -0.04   0.971    -2.388318    2.300909
    _Ifirm_9 |   2.091295   1.198021     1.75   0.082    -.2670497    4.449639
   _Ifirm_10 |   1.384888    1.22895     1.13   0.261    -1.034342    3.804119
   _Ifirm_11 |    1.86252   1.191439     1.56   0.119    -.4828695    4.207909
   _Ifirm_12 |    5.21657   2.831511     1.84   0.066    -.3573551     10.7905
   _Ifirm_13 |   8.521208   1.838943     4.63   0.000     4.901187    12.14123
   _Ifirm_14 |   1.399133   1.198937     1.17   0.244    -.9610162    3.759282
   _Ifirm_15 |   .6870607   1.191642     0.58   0.565    -1.658728    3.032849
   _Ifirm_16 |   2.617944   1.190049     2.20   0.029      .275292    4.960596
   _Ifirm_17 |   1.594066    1.50568     1.06   0.291    -1.369917    4.558049
   _Ifirm_18 |  -.0559023   1.190315    -0.05   0.963    -2.399077    2.287273
   _Ifirm_19 |   -1.33655   1.604119    -0.83   0.405    -4.494313    1.821213
   _Ifirm_20 |  -.7450219   1.189913    -0.63   0.532    -3.087406    1.597363
   _Ifirm_21 |  -1.014387   1.453642    -0.70   0.486    -3.875932    1.847157
   _Ifirm_22 |     15.699   1.963673     7.99   0.000     11.83345    19.56456
   _Ifirm_23 |   1.886556   1.230249     1.53   0.126    -.5352315    4.308344
   _Ifirm_24 |    4.08342   1.191887     3.43   0.001     1.737149    6.429691
   _Ifirm_25 |   4.729963   1.206502     3.92   0.000     2.354923    7.105003
   _Ifirm_26 |   10.62335   1.332165     7.97   0.000     8.000939    13.24576
   _Ifirm_27 |   2.864499   1.201554     2.38   0.018     .4991982      5.2298
   _Ifirm_28 |   5.558159   1.323455     4.20   0.000     2.952893    8.163424
```

_Ifirm_29	3.655649	1.252559	2.92	0.004	1.189944	6.121353
_Ifirm_30	.843245	1.191083	0.71	0.480	-1.501443	3.187933
_Ifirm_31	3.818018	1.199593	3.18	0.002	1.456578	6.179459
_cons	.229412	.8476473	0.27	0.787	-1.439211	1.898034

```
. vif
```

Variable	VIF	1/VIF
revtot	17.22	0.058060
_Ifirm_12	10.96	0.091244
_Ifirm_22	5.27	0.189715
_Ifirm_2	5.18	0.193009
_Ifirm_13	4.62	0.216323
_Ifirm_19	3.52	0.284293
_Ifirm_6	3.38	0.296063
_Ifirm_17	3.10	0.322681
_Ifirm_21	2.89	0.346198
_Ifirm_26	2.43	0.412214
_Ifirm_28	2.39	0.417658
_Ifirm_7	2.32	0.430691
_Ifirm_29	2.14	0.466276
_Ifirm_23	2.07	0.483340
_Ifirm_10	2.06	0.484362
_Ifirm_5	2.04	0.491000
_Ifirm_25	1.99	0.502554
_Ifirm_27	1.97	0.506701
_Ifirm_31	1.97	0.508359
_Ifirm_14	1.96	0.508916
_Ifirm_9	1.96	0.509695
_Ifirm_4	1.95	0.512130
_Ifirm_24	1.94	0.514954
_Ifirm_15	1.94	0.515166
_Ifirm_3	1.94	0.515281
_Ifirm_11	1.94	0.515341
_Ifirm_30	1.94	0.515650
_Ifirm_8	1.94	0.515682
_Ifirm_18	1.94	0.516316
_Ifirm_16	1.94	0.516546
_Ifirm_20	1.94	0.516664
Mean VIF	3.25	

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   142.45
         Prob > chi2  =   0.0000

. xtgls env revtot i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2785.09
Log likelihood             = -726.3486          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |   .0104371   .0011043     9.45   0.000     .0082728    .0126014
             |
        firm |
          2  |  -3.275144   1.843624    -1.78   0.076     -6.88858    .3382918
          3  |   10.90894   1.128337     9.67   0.000     8.697443    13.12044
          4  |   2.856449   1.131804     2.52   0.012     .6381544    5.074743
          5  |   2.413925     1.1559     2.09   0.037     .1484019    4.679447
          6  |   1.733054    1.48857     1.16   0.244    -1.184489    4.650597
          7  |   5.598151    1.23418     4.54   0.000     3.179203    8.017099
          8  |  -.0437049   1.127898    -0.04   0.969    -2.254345    2.166935
          9  |   2.091295   1.134504     1.84   0.065    -.1322914    4.314881
         10  |   1.384888   1.163793     1.19   0.234     -.896105    3.665881
         11  |    1.86252   1.128271     1.65   0.099    -.3488515    4.073891
         12  |    5.21657   2.681389     1.95   0.052    -.0388552      10.472
         13  |   8.521208   1.741445     4.89   0.000     5.108039    11.93438
         14  |   1.399133   1.135372     1.23   0.218    -.8261548     3.62442
         15  |   .6870607   1.128463     0.61   0.543    -1.524687    2.898809
         16  |   2.617944   1.126954     2.32   0.020     .4091536    4.826734
         17  |   1.594066   1.425852     1.12   0.264    -1.200552    4.388684
         18  |  -.0559023   1.127206    -0.05   0.960    -2.265186    2.153381
         19  |   -1.33655   1.519071    -0.88   0.379    -4.313875    1.640775
         20  |  -.7450219   1.126826    -0.66   0.509     -2.95356    1.463516
         21  |  -1.014387   1.376573    -0.74   0.461     -3.71242    1.683645
         22  |     15.699   1.859562     8.44   0.000     12.05433    19.34368
         23  |   1.886556   1.165023     1.62   0.105     -.396848     4.16996
         24  |    4.08342   1.128695     3.62   0.000     1.871218    6.295623
         25  |   4.729963   1.142535     4.14   0.000     2.490636    6.969291
         26  |   10.62335   1.261536     8.42   0.000     8.150787    13.09592
         27  |   2.864499    1.13785     2.52   0.012      .634354    5.094644
         28  |   5.558159   1.253287     4.43   0.000     3.101761    8.014557
         29  |   3.655649    1.18615     3.08   0.002     1.330837     5.98046
         30  |    .843245   1.127934     0.75   0.455    -1.367465    3.053955
         31  |   3.818018   1.135993     3.36   0.001     1.591513    6.044524
             |
       _cons |    .229412   .8027064     0.29   0.775    -1.343864    1.802688
------------------------------------------------------------------------------

.
. xi: reg env cos i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   79.10
       Model |  17648.8538    31  569.317866           Prob > F      =  0.0000
    Residual |  2000.78581   278  7.19707126           R-squared     =  0.8982
-------------+------------------------------           Adj R-squared =  0.8868
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.6827

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

cos	.0121743	.0014127	8.62	0.000	.0093933	.0149554
_Ifirm_2	-.7067402	1.770785	-0.40	0.690	-4.192591	2.779111
_Ifirm_3	10.83809	1.201056	9.02	0.000	8.473774	13.20241
_Ifirm_4	3.144473	1.202617	2.61	0.009	.7770804	5.511865
_Ifirm_5	2.965133	1.21951	2.43	0.016	.5644858	5.36578
_Ifirm_6	2.952407	1.515155	1.95	0.052	-.0302263	5.93504
_Ifirm_7	6.528558	1.279357	5.10	0.000	4.010099	9.047017
_Ifirm_8	-.1466402	1.200493	-0.12	0.903	-2.509851	2.21657
_Ifirm_9	2.396545	1.204708	1.99	0.048	.0250363	4.768054
_Ifirm_10	2.114007	1.222472	1.73	0.085	-.2924702	4.520484
_Ifirm_11	2.017696	1.200587	1.68	0.094	-.3457006	4.381092
_Ifirm_12	8.365994	2.596968	3.22	0.001	3.253774	13.47821
_Ifirm_13	9.697446	1.783611	5.44	0.000	6.186348	13.20854
_Ifirm_14	1.769762	1.204744	1.47	0.143	-.601817	4.141341
_Ifirm_15	.7962935	1.200972	0.66	0.508	-1.567861	3.160448
_Ifirm_16	2.640293	1.199866	2.20	0.029	.278316	5.00227
_Ifirm_17	3.225708	1.425013	2.26	0.024	.4205205	6.030895
_Ifirm_18	-.0806384	1.200115	-0.07	0.946	-2.443105	2.281828
_Ifirm_19	1.252428	1.451486	0.86	0.389	-1.604871	4.109727
_Ifirm_20	-.7348398	1.199762	-0.61	0.541	-3.096612	1.626932
_Ifirm_21	-.4793489	1.444894	-0.33	0.740	-3.323672	2.364974
_Ifirm_22	18.57426	1.760823	10.55	0.000	15.10802	22.0405
_Ifirm_23	2.602925	1.223801	2.13	0.034	.1938304	5.012019
_Ifirm_24	4.269697	1.200783	3.56	0.000	1.905915	6.63348
_Ifirm_25	5.340728	1.207466	4.42	0.000	2.96379	7.717665
_Ifirm_26	11.27317	1.318457	8.55	0.000	8.677744	13.8686
_Ifirm_27	3.048187	1.209347	2.52	0.012	.6675461	5.428828
_Ifirm_28	6.129622	1.313813	4.67	0.000	3.543337	8.715907
_Ifirm_29	4.403576	1.241571	3.55	0.000	1.959502	6.847651
_Ifirm_30	1.140645	1.199929	0.95	0.343	-1.221455	3.502746
_Ifirm_31	3.986785	1.207713	3.30	0.001	1.609361	6.364209
_cons	.3889353	.8529318	0.46	0.649	-1.29009	2.06796

. vif

Variable	VIF	1/VIF
cos	13.49	0.074126
_Ifirm_12	9.07	0.110271
_Ifirm_13	4.28	0.233774
_Ifirm_2	4.22	0.237173
_Ifirm_22	4.17	0.239864
_Ifirm_6	3.09	0.323953
_Ifirm_19	2.83	0.352997
_Ifirm_21	2.81	0.356225
_Ifirm_17	2.73	0.366234
_Ifirm_26	2.34	0.427823
_Ifirm_28	2.32	0.430853
_Ifirm_7	2.20	0.454373
_Ifirm_29	2.07	0.482451
_Ifirm_23	2.01	0.496563
_Ifirm_10	2.01	0.497644
_Ifirm_5	2.00	0.500064
_Ifirm_27	1.97	0.508504
_Ifirm_31	1.96	0.509881
_Ifirm_25	1.96	0.510090
_Ifirm_14	1.95	0.512397
_Ifirm_9	1.95	0.512428

```
    _Ifirm_4 |      1.94    0.514211
    _Ifirm_3 |      1.94    0.515549
   _Ifirm_15 |      1.94    0.515621
   _Ifirm_24 |      1.94    0.515783
   _Ifirm_11 |      1.94    0.515952
    _Ifirm_8 |      1.94    0.516033
   _Ifirm_18 |      1.94    0.516358
   _Ifirm_30 |      1.94    0.516518
   _Ifirm_16 |      1.94    0.516572
   _Ifirm_20 |      1.94    0.516662
-------------+----------------------
    Mean VIF |      2.93

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   153.19
         Prob > chi2  =   0.0000

. xtgls env cos i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2734.50
Log likelihood             =  -728.903          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cos |   .0121743   .0013378     9.10   0.000     .0095522    .0147964
             |
        firm |
          2  |  -.7067402   1.676901    -0.42   0.673    -3.993406    2.579926
          3  |   10.83809   1.137378     9.53   0.000     8.608873    13.06731
          4  |   3.144473   1.138856     2.76   0.006     .9123556     5.37659
          5  |   2.965133   1.154854     2.57   0.010     .7016613    5.228604
          6  |   2.952407   1.434824     2.06   0.040     .1402045     5.76461
          7  |   6.528558   1.211528     5.39   0.000     4.154007    8.903109
          8  |  -.1466402   1.136844    -0.13   0.897    -2.374814    2.081534
          9  |   2.396545   1.140837     2.10   0.036     .1605469    4.632544
         10  |   2.114007   1.157658     1.83   0.068    -.1549616    4.382975
         11  |   2.017696   1.136934     1.77   0.076    -.2106537    4.246045
         12  |   8.365994   2.459281     3.40   0.001     3.545892     13.1861
         13  |   9.697446   1.689047     5.74   0.000     6.386975    13.00792
         14  |   1.769762    1.14087     1.55   0.121    -.4663025    4.005827
         15  |   .7962935   1.137298     0.70   0.484     -1.43277    3.025357
         16  |   2.640293   1.136251     2.32   0.020     .4132819    4.867304
         17  |   3.225708   1.349461     2.39   0.017     .5808118    5.870603
         18  |  -.0806384   1.136487    -0.07   0.943    -2.308111    2.146834
         19  |   1.252428    1.37453     0.91   0.362    -1.441602    3.946458
```

```
          20  |  -.7348398   1.136152    -0.65   0.518    -2.961658    1.491978
          21  |  -.4793489   1.368288    -0.35   0.726    -3.161145    2.202447
          22  |   18.57426   1.667467    11.14   0.000     15.30609    21.84244
          23  |   2.602925   1.158917     2.25   0.025     .3314886    4.874361
          24  |   4.269697   1.137119     3.75   0.000     2.040984    6.498411
          25  |   5.340728   1.143448     4.67   0.000     3.099611    7.581844
          26  |   11.27317   1.248555     9.03   0.000      8.82605    13.72029
          27  |   3.048187   1.145229     2.66   0.008     .8035784    5.292795
          28  |   6.129622   1.244156     4.93   0.000      3.69112    8.568124
          29  |   4.403576   1.175745     3.75   0.000     2.099159    6.707994
          30  |   1.140645   1.136311     1.00   0.315    -1.086483    3.367773
          31  |   3.986785   1.143682     3.49   0.000      1.74521    6.228361
              |
       _cons  |   .3889353   .8077107     0.48   0.630    -1.194149    1.972019
------------------------------------------------------------------------------

.
. xi: reg env ni i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   61.81
       Model |   17159.805    31  553.542096           Prob > F      =  0.0000
    Residual |  2489.83468   278  8.95623984           R-squared     =  0.8733
-------------+------------------------------           Adj R-squared =  0.8592
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.9927

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |   .0186674   .0082904     2.25   0.025     .0023475    .0349873
    _Ifirm_2 |    10.0923   1.351582     7.47   0.000     7.431664    12.75293
    _Ifirm_3 |   10.44493   1.338949     7.80   0.000     7.809166     13.0807
    _Ifirm_4 |   3.815909   1.338511     2.85   0.005     1.181004    6.450814
    _Ifirm_5 |   4.785178   1.338675     3.57   0.000      2.14995    7.420406
    _Ifirm_6 |   10.82551   1.339128     8.08   0.000     8.189388    13.46163
    _Ifirm_7 |   10.09575   1.343383     7.52   0.000     7.451252    12.74024
    _Ifirm_8 |  -.4239531   1.338908    -0.32   0.752    -3.059639    2.211733
    _Ifirm_9 |   3.251885   1.338908     2.43   0.016     .6161998     5.88757
   _Ifirm_10 |   3.951533   1.340864     2.95   0.003     1.311997    6.591069
   _Ifirm_11 |   2.426265   1.338416     1.81   0.071    -.2084535    5.060983
   _Ifirm_12 |   27.62346   1.363821    20.25   0.000     24.93874    30.30819
   _Ifirm_13 |   21.00883   1.338657    15.69   0.000     18.37364    23.64402
   _Ifirm_14 |   2.697941   1.338393     2.02   0.045     .0632687    5.332613
   _Ifirm_15 |   1.268605   1.338378     0.95   0.344    -1.366038    3.903249
   _Ifirm_16 |   2.824856   1.338521     2.11   0.036     .1899329     5.45978
   _Ifirm_17 |   9.889222   1.338478     7.39   0.000     7.254383    12.52406
   _Ifirm_18 |  -.2821142    1.33857    -0.21   0.833    -2.917134    2.352906
   _Ifirm_19 |   6.394559   1.581658     4.04   0.000     3.281011    9.508106
   _Ifirm_20 |  -.7457007   1.338409    -0.56   0.578    -3.380405    1.889004
   _Ifirm_21 |   6.453895   1.338377     4.82   0.000     3.819254    9.088536
   _Ifirm_22 |   29.02958   1.369258    21.20   0.000     26.33415    31.72501
   _Ifirm_23 |   4.561059   1.339474     3.41   0.001     1.924259    7.197859
   _Ifirm_24 |   4.696405   1.338375     3.51   0.001     2.061768    7.331042
   _Ifirm_25 |   6.460398   1.338592     4.83   0.000     3.825334    9.095463
   _Ifirm_26 |   15.86184   1.339485    11.84   0.000     13.22502    18.49867
   _Ifirm_27 |   4.380023   1.338411     3.27   0.001     1.745316     7.01473
   _Ifirm_28 |   10.65785   1.338918     7.96   0.000     8.022141    13.29355
   _Ifirm_29 |   6.975966   1.340785     5.20   0.000     4.336585    9.615347
   _Ifirm_30 |   1.302269   1.338389     0.97   0.331    -1.332397    3.936934
```

```
   _Ifirm_31 |   5.119841   1.338637     3.82   0.000     2.484688    7.754994
       _cons |   1.058649     .94723     1.12   0.265    -.8060053    2.923304
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
   _Ifirm_19 |      2.70    0.369948
   _Ifirm_22 |      2.03    0.493624
   _Ifirm_12 |      2.01    0.497567
    _Ifirm_2 |      1.97    0.506619
    _Ifirm_7 |      1.95    0.512822
   _Ifirm_10 |      1.94    0.514751
   _Ifirm_29 |      1.94    0.514811
   _Ifirm_26 |      1.94    0.515811
   _Ifirm_23 |      1.94    0.515819
    _Ifirm_6 |      1.94    0.516086
    _Ifirm_3 |      1.94    0.516224
   _Ifirm_28 |      1.94    0.516248
    _Ifirm_8 |      1.94    0.516256
    _Ifirm_9 |      1.94    0.516256
    _Ifirm_5 |      1.94    0.516435
   _Ifirm_13 |      1.94    0.516449
   _Ifirm_31 |      1.94    0.516464
   _Ifirm_25 |      1.94    0.516499
   _Ifirm_18 |      1.94    0.516516
   _Ifirm_16 |      1.94    0.516554
    _Ifirm_4 |      1.94    0.516562
   _Ifirm_17 |      1.94    0.516587
   _Ifirm_11 |      1.94    0.516635
   _Ifirm_27 |      1.94    0.516639
   _Ifirm_20 |      1.94    0.516640
   _Ifirm_14 |      1.94    0.516653
   _Ifirm_30 |      1.94    0.516656
   _Ifirm_15 |      1.94    0.516664
   _Ifirm_21 |      1.94    0.516665
   _Ifirm_24 |      1.94    0.516667
          ni |      1.90    0.526287
-------------+----------------------
    Mean VIF |      1.97

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   209.00
         Prob > chi2  =   0.0000

. xtgls env ni i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
```

```
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2136.50
Log likelihood             = -762.7978          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |   .0186674   .0078508     2.38   0.017     .0032801    .0340548
             |
        firm |
          2  |    10.0923   1.279923     7.89   0.000     7.583695     12.6009
          3  |   10.44493    1.26796     8.24   0.000     7.959776    12.93009
          4  |   3.815909   1.267546     3.01   0.003     1.331565    6.300253
          5  |   4.785178   1.267701     3.77   0.000      2.30053    7.269826
          6  |   10.82551    1.26813     8.54   0.000     8.340018    13.31099
          7  |   10.09575   1.272159     7.94   0.000     7.602362    12.58913
          8  |  -.4239531   1.267921    -0.33   0.738    -2.909033    2.061127
          9  |   3.251885   1.267921     2.56   0.010     .7668056    5.736964
         10  |   3.951533   1.269773     3.11   0.002     1.462823    6.440244
         11  |   2.426265   1.267456     1.91   0.056    -.0579029    4.910432
         12  |   27.62346   1.291513    21.39   0.000     25.09214    30.15478
         13  |   21.00883   1.267684    16.57   0.000     18.52422    23.49345
         14  |   2.697941   1.267434     2.13   0.033     .2138166    5.182065
         15  |   1.268605    1.26742     1.00   0.317    -1.215492    3.752702
         16  |   2.824856   1.267555     2.23   0.026     .3404952    5.309218
         17  |   9.889222   1.267514     7.80   0.000      7.40494     12.3735
         18  |  -.2821142   1.267601    -0.22   0.824    -2.766566    2.202338
         19  |   6.394559   1.497801     4.27   0.000     3.458922    9.330195
         20  |  -.7457007   1.267449    -0.59   0.556    -3.229855    1.738454
         21  |   6.453895   1.267419     5.09   0.000       3.9698    8.937989
         22  |   29.02958   1.296662    22.39   0.000     26.48817    31.57099
         23  |   4.561059   1.268457     3.60   0.000     2.074929     7.04719
         24  |   4.696405   1.267417     3.71   0.000     2.212314    7.180496
         25  |   6.460398   1.267622     5.10   0.000     3.975904    8.944892
         26  |   15.86184   1.268468    12.50   0.000     13.37569      18.348
         27  |   4.380023    1.26745     3.46   0.001     1.895866     6.86418
         28  |   10.65785   1.267931     8.41   0.000     8.172748    13.14295
         29  |   6.975966   1.269699     5.49   0.000     4.487402     9.46453
         30  |   1.302269    1.26743     1.03   0.304    -1.181849    3.786386
         31  |   5.119841   1.267665     4.04   0.000     2.635263    7.604418
             |
       _cons |   1.058649   .8970094     1.18   0.238     -.699457    2.816755
------------------------------------------------------------------------------

.
. xi: reg env curra i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   75.37
       Model |  17560.3715    31  566.463597           Prob > F      =  0.0000
    Residual |  2089.26814   278  7.51535301           R-squared     =  0.8937
-------------+------------------------------           Adj R-squared =  0.8818
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.7414

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0201343   .0026137     7.70   0.000     .0149891    .0252795
```

_Ifirm_2	-1.127478	1.946255	-0.58	0.563	-4.958748	2.703792
_Ifirm_3	10.90702	1.228077	8.88	0.000	8.489504	13.32453
_Ifirm_4	3.045551	1.230536	2.47	0.014	.6231993	5.467903
_Ifirm_5	2.494342	1.263528	1.97	0.049	.007045	4.981639
_Ifirm_6	3.772761	1.538013	2.45	0.015	.7451293	6.800393
_Ifirm_7	6.726234	1.31346	5.12	0.000	4.140643	9.311825
_Ifirm_8	-.0158607	1.227668	-0.01	0.990	-2.432567	2.400845
_Ifirm_9	1.948245	1.23918	1.57	0.117	-.4911219	4.387613
_Ifirm_10	1.123144	1.286847	0.87	0.384	-1.410058	3.656346
_Ifirm_11	2.102208	1.226618	1.71	0.088	-.3124304	4.516847
_Ifirm_12	7.708261	2.930665	2.63	0.009	1.939147	13.47738
_Ifirm_13	10.82545	1.808836	5.98	0.000	7.26469	14.3862
_Ifirm_14	1.241093	1.240808	1.00	0.318	-1.20148	3.683665
_Ifirm_15	.9117303	1.22684	0.74	0.458	-1.503346	3.326807
_Ifirm_16	2.632197	1.226149	2.15	0.033	.218482	5.045913
_Ifirm_17	4.706925	1.396117	3.37	0.001	1.958621	7.455228
_Ifirm_18	-.1852069	1.226149	-0.15	0.880	-2.598923	2.228509
_Ifirm_19	-7.283828	2.364647	-3.08	0.002	-11.93872	-2.628939
_Ifirm_20	-.8528274	1.226048	-0.70	0.487	-3.266345	1.56069
_Ifirm_21	1.26583	1.399133	0.90	0.366	-1.488411	4.020071
_Ifirm_22	14.7812	2.289982	6.45	0.000	10.27329	19.28911
_Ifirm_23	2.531091	1.257426	2.01	0.045	.055806	5.006376
_Ifirm_24	4.217008	1.227584	3.44	0.001	1.800467	6.633549
_Ifirm_25	4.57799	1.25151	3.66	0.000	2.114349	7.04163
_Ifirm_26	11.18694	1.375118	8.14	0.000	8.479974	13.89391
_Ifirm_27	2.628679	1.246383	2.11	0.036	.1751304	5.082227
_Ifirm_28	6.19591	1.360735	4.55	0.000	3.517257	8.874563
_Ifirm_29	4.215186	1.284094	3.28	0.001	1.687403	6.742969
_Ifirm_30	.3595853	1.232271	0.29	0.771	-2.066182	2.785352
_Ifirm_31	3.820105	1.238633	3.08	0.002	1.381814	6.258396
_cons	.047672	.8786273	0.05	0.957	-1.681936	1.77728

. vif

Variable	VIF	1/VIF
curra	19.77	0.050569
_Ifirm_12	11.06	0.090419
_Ifirm_19	7.20	0.138886
_Ifirm_22	6.75	0.148090
_Ifirm_2	4.88	0.205017
_Ifirm_13	4.21	0.237351
_Ifirm_6	3.05	0.328299
_Ifirm_21	2.52	0.396709
_Ifirm_17	2.51	0.398425
_Ifirm_26	2.43	0.410686
_Ifirm_28	2.38	0.419414
_Ifirm_7	2.22	0.450149
_Ifirm_10	2.13	0.468960
_Ifirm_29	2.12	0.470973
_Ifirm_5	2.06	0.486430
_Ifirm_23	2.04	0.491162
_Ifirm_25	2.02	0.495817
_Ifirm_27	2.00	0.499904
_Ifirm_14	1.98	0.504407
_Ifirm_9	1.98	0.505733
_Ifirm_31	1.98	0.506180
_Ifirm_30	1.96	0.511420
_Ifirm_4	1.95	0.512863

```
    _Ifirm_3 |      1.94    0.514918
    _Ifirm_8 |      1.94    0.515262
   _Ifirm_24 |      1.94    0.515332
   _Ifirm_15 |      1.94    0.515957
   _Ifirm_11 |      1.94    0.516144
   _Ifirm_18 |      1.94    0.516539
   _Ifirm_16 |      1.94    0.516539
   _Ifirm_20 |      1.94    0.516624
-------------+----------------------
    Mean VIF |      3.44

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   138.04
         Prob > chi2  =   0.0000

. xtgls env curra i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2605.56
Log likelihood             = -735.6105          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0201343   .0024751     8.13   0.000     .0152831    .0249855
             |
        firm |
          2  |  -1.127478   1.843068    -0.61   0.541    -4.739825    2.484869
          3  |   10.90702   1.162967     9.38   0.000     8.627644    13.18639
          4  |   3.045551   1.165295     2.61   0.009      .761615    5.329487
          5  |   2.494342   1.196537     2.08   0.037     .1491718    4.839513
          6  |   3.772761   1.456471     2.59   0.010     .9181314    6.627391
          7  |   6.726234   1.243823     5.41   0.000     4.288387    9.164082
          8  |  -.0158607   1.162579    -0.01   0.989    -2.294474    2.262752
          9  |   1.948245    1.17348     1.66   0.097    -.3517339    4.248225
         10  |   1.123144   1.218621     0.92   0.357    -1.265309    3.511596
         11  |   2.102208   1.161585     1.81   0.070    -.1744554    4.378872
         12  |   7.708261   2.775286     2.78   0.005       2.2688    13.14772
         13  |   10.82545   1.712935     6.32   0.000     7.468156    14.18274
         14  |   1.241093   1.175022     1.06   0.291    -1.061909    3.544094
         15  |   .9117303   1.161795     0.78   0.433    -1.365346    3.188807
         16  |   2.632197    1.16114     2.27   0.023     .3564042    4.907991
         17  |   4.706925   1.322097     3.56   0.000     2.115662    7.298187
         18  |  -.1852069    1.16114    -0.16   0.873       -2.461    2.090587
         19  |  -7.283828   2.239277    -3.25   0.001    -11.67273   -2.894924
         20  |  -.8528274   1.161045    -0.73   0.463    -3.128434    1.422779
         21  |    1.26583   1.324953     0.96   0.339    -1.331031     3.86269
```

```
          22 |    14.7812    2.16857     6.82   0.000     10.53088    19.03152
          23 |   2.531091   1.190759     2.13   0.034     .1972464    4.864936
          24 |   4.217008     1.1625     3.63   0.000     1.938551    6.495466
          25 |    4.57799   1.185157     3.86   0.000     2.255124    6.900855
          26 |   11.18694   1.302212     8.59   0.000     8.634653    13.73923
          27 |   2.628679   1.180302     2.23   0.026     .3153288    4.942028
          28 |    6.19591   1.288591     4.81   0.000     3.670318    8.721502
          29 |   4.215186   1.216014     3.47   0.001     1.831844    6.598529
          30 |   .3595853   1.166938     0.31   0.758    -1.927571    2.646742
          31 |   3.820105   1.172963     3.26   0.001      1.52114    6.119069
             |
       _cons |    .047672   .8320439     0.06   0.954    -1.583104    1.678448
------------------------------------------------------------------------------

.
. xi: reg env asset i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   70.72
       Model |  17438.3439    31  562.527222           Prob > F      =  0.0000
    Residual |  2211.29577   278  7.95430133           R-squared     =  0.8875
-------------+------------------------------           Adj R-squared =  0.8749
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.8203

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0082681   .0012956     6.38   0.000     .0057177    .0108186
    _Ifirm_2 |    .290059   2.039324     0.14   0.887    -3.724421    4.304539
    _Ifirm_3 |   10.54835   1.261651     8.36   0.000     8.064744    13.03195
    _Ifirm_4 |   2.629446   1.275921     2.06   0.040     .1177517    5.141141
    _Ifirm_5 |   1.834527   1.346843     1.36   0.174    -.8167786    4.485833
    _Ifirm_6 |   3.541017   1.711787     2.07   0.040      .171305    6.910728
    _Ifirm_7 |   7.484141   1.339206     5.59   0.000      4.84787    10.12041
    _Ifirm_8 |  -.2012149   1.262215    -0.16   0.873    -2.685928    2.283498
    _Ifirm_9 |    2.02473   1.277943     1.58   0.114    -.4909433    4.540404
   _Ifirm_10 |   .8739593   1.360898     0.64   0.521    -1.805015    3.552933
   _Ifirm_11 |   1.551368   1.268327     1.22   0.222    -.9453764    4.048111
   _Ifirm_12 |   9.318236   3.218362     2.90   0.004     2.982782    15.65369
   _Ifirm_13 |   11.02567   2.017039     5.47   0.000     7.055058    14.99628
   _Ifirm_14 |   1.336133   1.279626     1.04   0.297    -1.182855     3.85512
   _Ifirm_15 |   .4442692   1.267784     0.35   0.726    -2.051406    2.939944
   _Ifirm_16 |    2.38901   1.262783     1.89   0.060    -.0968217    4.874842
   _Ifirm_17 |   3.909995    1.56773     2.49   0.013     .8238651    6.996125
   _Ifirm_18 |   -.324205   1.261294    -0.26   0.797    -2.807105    2.158695
   _Ifirm_19 |   -3.96593   2.297943    -1.73   0.085    -8.489509     .557649
   _Ifirm_20 |  -.8327899   1.261335    -0.66   0.510     -3.31577    1.650191
   _Ifirm_21 |   -.977335   1.717195    -0.57   0.570    -4.357692    2.403022
   _Ifirm_22 |   14.80293    2.65064     5.58   0.000     9.585057     20.0208
   _Ifirm_23 |   1.860221   1.336614     1.39   0.165    -.7709504    4.491391
   _Ifirm_24 |   3.911282   1.267297     3.09   0.002     1.416565       6.406
   _Ifirm_25 |   4.179951   1.313281     3.18   0.002     1.594713    6.765189
   _Ifirm_26 |   11.23469   1.464529     7.67   0.000     8.351716    14.11766
   _Ifirm_27 |   2.703763   1.287657     2.10   0.037      .168966     5.23856
   _Ifirm_28 |   5.438305   1.510627     3.60   0.000     2.464585    8.412025
   _Ifirm_29 |    4.37581   1.334456     3.28   0.001     1.748887    7.002733
   _Ifirm_30 |   .3919426   1.269581     0.31   0.758    -2.107271    2.891156
   _Ifirm_31 |   3.589156   1.285676     2.79   0.006     1.058259    6.120053
       _cons |   .4833331   .8979534     0.54   0.591    -1.284319    2.250985
```

```
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
       asset |     22.33    0.044778
   _Ifirm_12 |     12.60    0.079355
   _Ifirm_22 |      8.55    0.116988
   _Ifirm_19 |      6.42    0.155655
    _Ifirm_2 |      5.06    0.197638
   _Ifirm_13 |      4.95    0.202029
   _Ifirm_21 |      3.59    0.278742
    _Ifirm_6 |      3.56    0.280506
   _Ifirm_17 |      2.99    0.334426
   _Ifirm_28 |      2.78    0.360187
   _Ifirm_26 |      2.61    0.383219
   _Ifirm_10 |      2.25    0.443804
    _Ifirm_5 |      2.21    0.453115
    _Ifirm_7 |      2.18    0.458298
   _Ifirm_23 |      2.17    0.460077
   _Ifirm_29 |      2.17    0.461566
   _Ifirm_25 |      2.10    0.476571
   _Ifirm_27 |      2.02    0.495726
   _Ifirm_31 |      2.01    0.497255
   _Ifirm_14 |      1.99    0.501968
    _Ifirm_9 |      1.99    0.503292
    _Ifirm_4 |      1.98    0.504888
   _Ifirm_30 |      1.96    0.509943
   _Ifirm_11 |      1.96    0.510952
   _Ifirm_15 |      1.96    0.511390
   _Ifirm_24 |      1.95    0.511783
   _Ifirm_16 |      1.94    0.515448
    _Ifirm_8 |      1.94    0.515912
    _Ifirm_3 |      1.94    0.516374
   _Ifirm_20 |      1.94    0.516632
   _Ifirm_18 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      3.74

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   146.47
         Prob > chi2  =   0.0000

. xtgls env asset i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
```

```
                                                  Wald chi2(31)      =   2444.67
Log likelihood             =  -744.409            Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0082681   .0012269     6.74   0.000     .0058634    .0106728
             |
        firm |
          2  |    .290059   1.931203     0.15   0.881    -3.495029    4.075147
          3  |   10.54835    1.19476     8.83   0.000      8.20666    12.89003
          4  |   2.629446   1.208274     2.18   0.030     .2612726     4.99762
          5  |   1.834527   1.275435     1.44   0.150    -.6652802    4.334335
          6  |   3.541017   1.621031     2.18   0.029     .3638538    6.718179
          7  |   7.484141   1.268203     5.90   0.000     4.998509    9.969774
          8  |  -.2012149   1.195294    -0.17   0.866    -2.543949    2.141519
          9  |    2.02473   1.210188     1.67   0.094    -.3471951    4.396656
         10  |   .8739593   1.288745     0.68   0.498    -1.651935    3.399854
         11  |   1.551368   1.201082     1.29   0.196    -.8027098    3.905445
         12  |   9.318236   3.047729     3.06   0.002     3.344796    15.29168
         13  |   11.02567   1.910099     5.77   0.000     7.281942    14.76939
         14  |   1.336133   1.211782     1.10   0.270    -1.038917    3.711183
         15  |   .4442692   1.200568     0.37   0.711      -1.9088    2.797339
         16  |    2.38901   1.195833     2.00   0.046     .0452213    4.732799
         17  |   3.909995   1.484612     2.63   0.008      1.00021     6.81978
         18  |   -.324205   1.194422    -0.27   0.786    -2.665229    2.016819
         19  |   -3.96593    2.17611    -1.82   0.068    -8.231027    .2991669
         20  |  -.8327899   1.194461    -0.70   0.486     -3.17389     1.50831
         21  |   -.977335   1.626152    -0.60   0.548    -4.164535    2.209865
         22  |   14.80293   2.510107     5.90   0.000     9.883211    19.72265
         23  |   1.860221   1.265749     1.47   0.142    -.6206025    4.341044
         24  |   3.911282   1.200107     3.26   0.001     1.559116    6.263449
         25  |   4.179951   1.243653     3.36   0.001     1.742436    6.617466
         26  |   11.23469   1.386882     8.10   0.000     8.516452    13.95293
         27  |   2.703763   1.219388     2.22   0.027      .313807    5.093719
         28  |   5.438305   1.430536     3.80   0.000     2.634506    8.242104
         29  |    4.37581   1.263706     3.46   0.001     1.898992    6.852628
         30  |   .3919426    1.20227     0.33   0.744    -1.964463    2.748348
         31  |   3.589156   1.217512     2.95   0.003     1.202877    5.975434
             |
       _cons |   .4833331   .8503453     0.57   0.570    -1.183313    2.149979
------------------------------------------------------------------------------

.
. xi: reg env currl i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   63.48
       Model |  17217.5061    31  555.403423           Prob > F      =  0.0000
    Residual |  2432.13353   278  8.74868175           R-squared     =  0.8762
-------------+------------------------------           Adj R-squared =  0.8624
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.9578

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0140047   .0040794     3.43   0.001     .0059743     .022035
    _Ifirm_2 |   4.743464   2.139562     2.22   0.027     .5316626    8.955265
    _Ifirm_3 |   10.52981   1.323737     7.95   0.000     7.923994    13.13564
```

_Ifirm_4	3.077952	1.342193	2.29	0.023	.4357987	5.720105
_Ifirm_5	3.370372	1.39113	2.42	0.016	.6318852	6.108858
_Ifirm_6	5.399157	2.083759	2.59	0.010	1.297206	9.501108
_Ifirm_7	8.528002	1.426001	5.98	0.000	5.720871	11.33513
_Ifirm_8	-.4732237	1.322817	-0.36	0.721	-3.077234	2.130787
_Ifirm_9	2.686758	1.336263	2.01	0.045	.0562783	5.317238
_Ifirm_10	3.204264	1.350296	2.37	0.018	.5461602	5.862369
_Ifirm_11	1.86593	1.331981	1.40	0.162	-.7561203	4.48798
_Ifirm_12	14.62789	4.172633	3.51	0.001	6.413923	22.84186
_Ifirm_13	14.68769	2.281811	6.44	0.000	10.19587	19.17952
_Ifirm_14	1.692449	1.3558	1.25	0.213	-.9764896	4.361387
_Ifirm_15	.7689174	1.330548	0.58	0.564	-1.850311	3.388146
_Ifirm_16	2.683544	1.323077	2.03	0.043	.079022	5.288065
_Ifirm_17	5.852054	1.762723	3.32	0.001	2.382074	9.322035
_Ifirm_18	-.3943279	1.322895	-0.30	0.766	-2.998491	2.209835
_Ifirm_19	4.087547	1.80275	2.27	0.024	.5387716	7.636322
_Ifirm_20	-.8734151	1.323137	-0.66	0.510	-3.478055	1.731225
_Ifirm_21	1.24851	2.01332	0.62	0.536	-2.714778	5.211799
_Ifirm_22	21.18712	2.80548	7.55	0.000	15.66444	26.7098
_Ifirm_23	3.17545	1.393779	2.28	0.023	.4317481	5.919152
_Ifirm_24	4.34966	1.326653	3.28	0.001	1.738098	6.961221
_Ifirm_25	5.408632	1.361447	3.97	0.000	2.728578	8.088687
_Ifirm_26	12.06968	1.746471	6.91	0.000	8.631692	15.50767
_Ifirm_27	3.399263	1.35194	2.51	0.012	.7379229	6.060604
_Ifirm_28	6.576187	1.795378	3.66	0.000	3.041925	10.11045
_Ifirm_29	5.787931	1.381574	4.19	0.000	3.068255	8.507607
_Ifirm_30	1.080756	1.324553	0.82	0.415	-1.526671	3.688183
_Ifirm_31	4.411833	1.341543	3.29	0.001	1.770959	7.052706
_cons	.8225094	.9401751	0.87	0.382	-1.028257	2.673276

. vif

Variable	VIF	1/VIF
currl	28.93	0.034572
_Ifirm_12	19.26	0.051923
_Ifirm_22	8.71	0.114860
_Ifirm_13	5.76	0.173630
_Ifirm_2	5.06	0.197485
_Ifirm_6	4.80	0.208203
_Ifirm_21	4.48	0.223027
_Ifirm_19	3.59	0.278171
_Ifirm_28	3.57	0.280460
_Ifirm_17	3.44	0.290948
_Ifirm_26	3.37	0.296388
_Ifirm_7	2.25	0.444573
_Ifirm_23	2.15	0.465366
_Ifirm_5	2.14	0.467141
_Ifirm_29	2.11	0.473625
_Ifirm_25	2.05	0.487732
_Ifirm_14	2.03	0.491804
_Ifirm_27	2.02	0.494616
_Ifirm_10	2.02	0.495821
_Ifirm_4	1.99	0.501826
_Ifirm_31	1.99	0.502312
_Ifirm_9	1.98	0.506289
_Ifirm_11	1.96	0.509550
_Ifirm_15	1.96	0.510649
_Ifirm_24	1.95	0.513651

```
   _Ifirm_30 |      1.94    0.515282
    _Ifirm_3 |      1.94    0.515917
   _Ifirm_20 |      1.94    0.516385
   _Ifirm_16 |      1.94    0.516432
   _Ifirm_18 |      1.94    0.516574
    _Ifirm_8 |      1.94    0.516635
-------------+----------------------
    Mean VIF |      4.23

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   142.21
         Prob > chi2  =   0.0000

. xtgls env currl i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2194.55
Log likelihood             = -759.1635          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0140047   .0038631     3.63   0.000     .0064332    .0215762
             |
        firm |
          2  |   4.743464   2.026126     2.34   0.019     .7723293    8.714599
          3  |   10.52981   1.253554     8.40   0.000     8.072893    12.98674
          4  |   3.077952   1.271033     2.42   0.015     .5867741     5.56913
          5  |   3.370372   1.317374     2.56   0.011     .7883652    5.952378
          6  |   5.399157   1.973282     2.74   0.006     1.531596    9.266718
          7  |   8.528002   1.350396     6.32   0.000     5.881274    11.17473
          8  |  -.4732237   1.252683    -0.38   0.706    -2.928438    1.981991
          9  |   2.686758   1.265417     2.12   0.034     .2065867     5.16693
         10  |   3.204264   1.278706     2.51   0.012      .698047    5.710482
         11  |    1.86593   1.261362     1.48   0.139    -.6062936    4.338153
         12  |   14.62789   3.951407     3.70   0.000     6.883278    22.37251
         13  |   14.68769   2.160833     6.80   0.000     10.45254    18.92285
         14  |   1.692449   1.283918     1.32   0.187    -.8239836    4.208881
         15  |   .7689174   1.260004     0.61   0.542    -1.700645     3.23848
         16  |   2.683544   1.252929     2.14   0.032     .2278471     5.13924
         17  |   5.852054   1.669266     3.51   0.000     2.580352    9.123756
         18  |  -.3943279   1.252757    -0.31   0.753    -2.849686    2.061031
         19  |   4.087547   1.707171     2.39   0.017     .7415524    7.433541
         20  |  -.8734151   1.252987    -0.70   0.486    -3.329224    1.582393
         21  |    1.24851   1.906577     0.65   0.513    -2.488312    4.985333
         22  |   21.18712   2.656738     7.97   0.000     15.98001    26.39423
         23  |    3.17545   1.319884     2.41   0.016     .5885261    5.762374
```

```
          24 |    4.34966   1.256316     3.46   0.001     1.887325    6.811994
          25 |   5.408632   1.289265     4.20   0.000     2.881719    7.935545
          26 |   12.06968   1.653876     7.30   0.000     8.828142    15.31122
          27 |   3.399263   1.280263     2.66   0.008     .8899947    5.908532
          28 |   6.576187    1.70019     3.87   0.000     3.243876    9.908499
          29 |   5.787931   1.308325     4.42   0.000      3.22366    8.352201
          30 |   1.080756   1.254327     0.86   0.389     -1.37768    3.539192
          31 |   4.411833   1.270417     3.47   0.001     1.921861    6.901804
             |
       _cons |   .8225094   .8903285     0.92   0.356    -.9225024    2.567521
------------------------------------------------------------------------------

.
. xi: reg env ltd i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   61.38
       Model |  17144.6132    31  553.052039           Prob > F      =  0.0000
    Residual |  2505.02644   278  9.01088647           R-squared     =  0.8725
-------------+------------------------------           Adj R-squared =  0.8583
       Total |  19649.6396   309  63.5910668           Root MSE      =  3.0018

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |   .0077371    .004225     1.83   0.068       -.00058    .0160542
    _Ifirm_2 |   9.171528   1.530283     5.99   0.000     6.159115    12.18394
    _Ifirm_3 |   10.35639   1.342452     7.71   0.000     7.713728    12.99905
    _Ifirm_4 |   3.678389   1.346066     2.73   0.007     1.028612    6.328166
    _Ifirm_5 |   4.206354   1.387563     3.03   0.003     1.474889     6.93782
    _Ifirm_6 |   8.508419   1.883063     4.52   0.000     4.801545    12.21529
    _Ifirm_7 |   10.17381   1.346162     7.56   0.000     7.523847    12.82378
    _Ifirm_8 |  -.5319219    1.34251    -0.40   0.692    -3.174699    2.110855
    _Ifirm_9 |   3.300476   1.342599     2.46   0.015     .6575238    5.943429
   _Ifirm_10 |   3.914546   1.347858     2.90   0.004     1.261241    6.567851
   _Ifirm_11 |   2.271237   1.344367     1.69   0.092    -.3751956    4.917669
   _Ifirm_12 |   24.29644   2.525568     9.62   0.000     19.32477    29.26811
   _Ifirm_13 |   18.81843   1.820676    10.34   0.000     15.23437    22.40249
   _Ifirm_14 |   2.561436   1.345018     1.90   0.058    -.0862776    5.209149
   _Ifirm_15 |   1.095302   1.345531     0.81   0.416    -1.553421    3.744026
   _Ifirm_16 |   2.734627   1.342685     2.04   0.043     .0915063    5.377747
   _Ifirm_17 |   9.219344    1.38618     6.65   0.000     6.490602    11.94809
   _Ifirm_18 |  -.3558981   1.342508    -0.27   0.791     -2.99867    2.286874
   _Ifirm_19 |   7.866063    1.36249     5.77   0.000     5.183956    10.54817
   _Ifirm_20 |  -.7762956   1.342461    -0.58   0.564    -3.418976    1.866384
   _Ifirm_21 |   4.465461   1.728444     2.58   0.010     1.062961    7.867961
   _Ifirm_22 |   26.82423   2.057989    13.03   0.000       22.773    30.87545
   _Ifirm_23 |   3.902003   1.408602     2.77   0.006     1.129123    6.674884
   _Ifirm_24 |   4.573352   1.344165     3.40   0.001     1.927317    7.219387
   _Ifirm_25 |   5.956187   1.376661     4.33   0.000     3.246182    8.666192
   _Ifirm_26 |   14.74937   1.502387     9.82   0.000     11.79187    17.70687
   _Ifirm_27 |   4.006414   1.356119     2.95   0.003     1.336847    6.675981
   _Ifirm_28 |   9.116645   1.609846     5.66   0.000     5.947609    12.28568
   _Ifirm_29 |   6.857153   1.352394     5.07   0.000      4.19492    9.519387
   _Ifirm_30 |   1.234951   1.343185     0.92   0.359    -1.409155    3.879056
   _Ifirm_31 |   4.905583    1.35076     3.63   0.000     2.246567    7.564599
       _cons |   1.147746   .9492573     1.21   0.228    -.7208996    3.016391
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         ltd |     10.85    0.092203
   _Ifirm_12 |      6.85    0.145979
   _Ifirm_22 |      4.55    0.219848
    _Ifirm_6 |      3.81    0.262590
   _Ifirm_13 |      3.56    0.280894
   _Ifirm_21 |      3.21    0.311672
   _Ifirm_28 |      2.78    0.359285
    _Ifirm_2 |      2.51    0.397617
   _Ifirm_26 |      2.42    0.412519
   _Ifirm_23 |      2.13    0.469279
    _Ifirm_5 |      2.07    0.483618
   _Ifirm_17 |      2.06    0.484584
   _Ifirm_25 |      2.04    0.491308
   _Ifirm_19 |      1.99    0.501581
   _Ifirm_27 |      1.98    0.506305
   _Ifirm_29 |      1.96    0.509098
   _Ifirm_31 |      1.96    0.510331
   _Ifirm_10 |      1.95    0.512530
    _Ifirm_7 |      1.95    0.513823
    _Ifirm_4 |      1.95    0.513896
   _Ifirm_15 |      1.94    0.514305
   _Ifirm_14 |      1.94    0.514697
   _Ifirm_11 |      1.94    0.515196
   _Ifirm_24 |      1.94    0.515350
   _Ifirm_30 |      1.94    0.516103
   _Ifirm_16 |      1.94    0.516488
    _Ifirm_9 |      1.94    0.516553
    _Ifirm_8 |      1.94    0.516622
   _Ifirm_18 |      1.94    0.516624
   _Ifirm_20 |      1.94    0.516660
    _Ifirm_3 |      1.94    0.516667
-------------+----------------------
    Mean VIF |      2.71

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   171.99
         Prob > chi2  =   0.0000

. xtgls env ltd i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2121.67
Log likelihood             = -763.7407          Prob > chi2        =    0.0000
```

```
------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |   .0077371    .004001     1.93   0.053    -.0001048    .0155789
             |
        firm |
          2  |   9.171528    1.44915     6.33   0.000     6.331247    12.01181
          3  |   10.35639   1.271277     8.15   0.000     7.864733    12.84805
          4  |   3.678389     1.2747     2.89   0.004     1.180023    6.176755
          5  |   4.206354   1.313997     3.20   0.001     1.630968    6.781741
          6  |   8.508419   1.783226     4.77   0.000      5.01336    12.00348
          7  |   10.17381    1.27479     7.98   0.000     7.675268    12.67236
          8  |  -.5319219   1.271333    -0.42   0.676    -3.023688    1.959844
          9  |   3.300476   1.271417     2.60   0.009     .8085449    5.792407
         10  |   3.914546   1.276397     3.07   0.002     1.412854    6.416239
         11  |   2.271237   1.273091     1.78   0.074    -.2239756    4.766449
         12  |   24.29644   2.391666    10.16   0.000     19.60886    28.98402
         13  |   18.81843   1.724146    10.91   0.000     15.43916    22.19769
         14  |   2.561436   1.273707     2.01   0.044     .0650156    5.057856
         15  |   1.095302   1.274193     0.86   0.390     -1.40207    3.592675
         16  |   2.734627   1.271498     2.15   0.031      .242537    5.226716
         17  |   9.219344   1.312687     7.02   0.000     6.646525    11.79216
         18  |  -.3558981    1.27133    -0.28   0.780    -2.847659    2.135863
         19  |   7.866063   1.290253     6.10   0.000     5.337214    10.39491
         20  |  -.7762956   1.271286    -0.61   0.541     -3.26797    1.715379
         21  |   4.465461   1.636805     2.73   0.006     1.257383    7.673539
         22  |   26.82423   1.948878    13.76   0.000     23.00449    30.64396
         23  |   3.902003    1.33392     2.93   0.003     1.287568    6.516438
         24  |   4.573352     1.2729     3.59   0.000     2.078514     7.06819
         25  |   5.956187   1.303673     4.57   0.000     3.401035    8.511339
         26  |   14.74937   1.422733    10.37   0.000     11.96087    17.53788
         27  |   4.006414    1.28422     3.12   0.002     1.489389    6.523439
         28  |   9.116645   1.524494     5.98   0.000     6.128691     12.1046
         29  |   6.857153   1.280692     5.35   0.000     4.347042    9.367264
         30  |   1.234951   1.271971     0.97   0.332    -1.258068    3.727969
         31  |   4.905583   1.279144     3.84   0.000     2.398506     7.41266
             |
       _cons |   1.147746   .8989292     1.28   0.202    -.6141232    2.909614
------------------------------------------------------------------------------

.
. xi: reg env liab i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   62.82
       Model |  17195.0745    31  554.679824           Prob > F      =  0.0000
    Residual |   2454.5651   278  8.82937088           R-squared     =  0.8751
-------------+------------------------------           Adj R-squared =  0.8612
       Total |  19649.6396   309  63.5910668           Root MSE      =  2.9714

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0068681   .0022721     3.02   0.003     .0023955    .0113407
    _Ifirm_2 |   5.496204   2.127042     2.58   0.010      1.30905    9.683359
    _Ifirm_3 |   10.43103   1.329089     7.85   0.000     7.814671    13.04739
    _Ifirm_4 |   3.166391   1.348465     2.35   0.020     .5118917    5.820889
    _Ifirm_5 |   3.393992   1.413351     2.40   0.017     .6117627    6.176221
```

_Ifirm_6	5.594605	2.208444	2.53	0.012	1.247208	9.942001
_Ifirm_7	9.095441	1.392827	6.53	0.000	6.353614	11.83727
_Ifirm_8	-.5307273	1.328881	-0.40	0.690	-3.146675	2.085221
_Ifirm_9	2.859663	1.338207	2.14	0.033	.2253561	5.49397
_Ifirm_10	3.23427	1.361889	2.37	0.018	.5533449	5.915195
_Ifirm_11	1.970256	1.336537	1.47	0.142	-.6607617	4.601274
_Ifirm_12	17.04136	3.927669	4.34	0.000	9.309607	24.77311
_Ifirm_13	15.48772	2.275308	6.81	0.000	11.0087	19.96674
_Ifirm_14	1.978034	1.350952	1.46	0.144	-.6813603	4.637428
_Ifirm_15	.7741981	1.33862	0.58	0.563	-1.860922	3.409318
_Ifirm_16	2.644388	1.329624	1.99	0.048	.0269791	5.261797
_Ifirm_17	6.83613	1.661686	4.11	0.000	3.565044	10.10722
_Ifirm_18	-.4090485	1.329097	-0.31	0.758	-3.025421	2.207324
_Ifirm_19	5.510434	1.616432	3.41	0.001	2.328432	8.692436
_Ifirm_20	-.8307423	1.329028	-0.63	0.532	-3.446979	1.785494
_Ifirm_21	1.58359	2.089831	0.76	0.449	-2.530314	5.697493
_Ifirm_22	22.06513	2.848326	7.75	0.000	16.4581	27.67215
_Ifirm_23	3.038909	1.435884	2.12	0.035	.2123233	5.865495
_Ifirm_24	4.375741	1.333121	3.28	0.001	1.751447	7.000035
_Ifirm_25	5.318454	1.386536	3.84	0.000	2.589011	8.047896
_Ifirm_26	12.77215	1.701546	7.51	0.000	9.422597	16.1217
_Ifirm_27	3.548491	1.355584	2.62	0.009	.8799781	6.217003
_Ifirm_28	7.018954	1.812234	3.87	0.000	3.45151	10.5864
_Ifirm_29	6.050648	1.378334	4.39	0.000	3.337351	8.763945
_Ifirm_30	.9623835	1.334007	0.72	0.471	-1.663654	3.588421
_Ifirm_31	4.495871	1.347969	3.34	0.001	1.842349	7.149393
_cons	.9795473	.9413239	1.04	0.299	-.8734808	2.832575

. vif

Variable	VIF	1/VIF
liab	26.85	0.037238
_Ifirm_12	16.91	0.059143
_Ifirm_22	8.89	0.112458
_Ifirm_13	5.67	0.176234
_Ifirm_6	5.35	0.187067
_Ifirm_2	4.96	0.201659
_Ifirm_21	4.79	0.208904
_Ifirm_28	3.60	0.277806
_Ifirm_26	3.17	0.315125
_Ifirm_17	3.03	0.330424
_Ifirm_19	2.86	0.349185
_Ifirm_23	2.26	0.442519
_Ifirm_5	2.19	0.456741
_Ifirm_7	2.13	0.470301
_Ifirm_25	2.11	0.474579
_Ifirm_29	2.08	0.480243
_Ifirm_10	2.03	0.491911
_Ifirm_27	2.01	0.496498
_Ifirm_14	2.00	0.499909
_Ifirm_4	1.99	0.501754
_Ifirm_31	1.99	0.502123
_Ifirm_15	1.96	0.509161
_Ifirm_9	1.96	0.509475
_Ifirm_11	1.96	0.510750
_Ifirm_30	1.95	0.512689
_Ifirm_24	1.95	0.513371
_Ifirm_16	1.94	0.516075

```
   _Ifirm_18 |      1.94    0.516484
    _Ifirm_3 |      1.94    0.516490
   _Ifirm_20 |      1.94    0.516538
    _Ifirm_8 |      1.94    0.516652
-------------+----------------------
    Mean VIF |      4.08

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   152.45
         Prob > chi2  =   0.0000

. xtgls env liab i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2171.66
Log likelihood             = -760.5865          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0068681   .0021516     3.19   0.001      .002651    .0110852
             |
        firm |
          2  |   5.496204    2.01427     2.73   0.006     1.548308      9.4441
          3  |   10.43103   1.258623     8.29   0.000     7.964173    12.89789
          4  |   3.166391   1.276971     2.48   0.013     .6635726    5.669209
          5  |   3.393992   1.338417     2.54   0.011     .7707422    6.017241
          6  |   5.594605   2.091356     2.68   0.007     1.495623    9.693586
          7  |   9.095441   1.318981     6.90   0.000     6.510285     11.6806
          8  |  -.5307273   1.258426    -0.42   0.673    -2.997197    1.935743
          9  |   2.859663   1.267258     2.26   0.024     .3758831    5.343443
         10  |    3.23427   1.289684     2.51   0.012     .7065358    5.762004
         11  |   1.970256   1.265676     1.56   0.120    -.5104225    4.450935
         12  |   17.04136   3.719431     4.58   0.000     9.751408    24.33131
         13  |   15.48772   2.154675     7.19   0.000     11.26464    19.71081
         14  |   1.978034   1.279326     1.55   0.122    -.5293997    4.485468
         15  |   .7741981   1.267649     0.61   0.541    -1.710348    3.258744
         16  |   2.644388   1.259129     2.10   0.036     .1765406    5.112236
         17  |    6.83613   1.573586     4.34   0.000     3.751957    9.920302
         18  |  -.4090485    1.25863    -0.32   0.745    -2.875919    2.057822
         19  |   5.510434   1.530732     3.60   0.000     2.510255    8.510613
         20  |  -.8307423   1.258565    -0.66   0.509    -3.297484    1.635999
         21  |    1.58359   1.979032     0.80   0.424    -2.295242    5.462421
         22  |   22.06513   2.697312     8.18   0.000     16.77849    27.35176
         23  |   3.038909   1.359755     2.23   0.025     .3738374    5.703981
         24  |   4.375741   1.262441     3.47   0.001     1.901402     6.85008
         25  |   5.318454   1.313024     4.05   0.000     2.744974    7.891933
```

```
          26 |   12.77215   1.611333     7.93   0.000     9.613994     15.9303
          27 |   3.548491   1.283713     2.76   0.006      1.03246    6.064522
          28 |   7.018954   1.716152     4.09   0.000     3.655358    10.38255
          29 |   6.050648   1.305257     4.64   0.000     3.492391    8.608904
          30 |   .9623835    1.26328     0.76   0.446      -1.5136    3.438367
          31 |   4.495871   1.276502     3.52   0.000     1.993974    6.997768
             |
       _cons |   .9795473   .8914164     1.10   0.272    -.7675968    2.726691
------------------------------------------------------------------------------

.
. xi: reg env oe i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     310
-------------+------------------------------           F( 31,   278) =   73.17
       Model |  17504.3072    31  564.655071           Prob > F      =  0.0000
    Residual |  2145.33246   278  7.71702324           R-squared     =  0.8908
-------------+------------------------------           Adj R-squared =  0.8786
       Total |  19649.6396   309  63.5910668           Root MSE      =   2.778

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          oe |    .014213   .0019995     7.11   0.000     .0102769    .0181491
    _Ifirm_2 |   3.326518   1.602065     2.08   0.039     .1727989    6.480237
    _Ifirm_3 |   10.53232   1.242584     8.48   0.000     8.086254    12.97839
    _Ifirm_4 |    3.17855    1.24602     2.55   0.011     .7257171    5.631382
    _Ifirm_5 |   2.678115   1.279327     2.09   0.037     .1597161    5.196514
    _Ifirm_6 |   9.264847   1.264143     7.33   0.000     6.776338    11.75336
    _Ifirm_7 |   8.028818   1.284779     6.25   0.000     5.499687    10.55795
    _Ifirm_8 |   .0650484    1.24496     0.05   0.958    -2.385699    2.515795
    _Ifirm_9 |   2.068871   1.255081     1.65   0.100    -.4017981     4.53954
   _Ifirm_10 |   .3937679   1.349254     0.29   0.771    -2.262283    3.049819
   _Ifirm_11 |   1.834024   1.244911     1.47   0.142    -.6166256    4.284673
   _Ifirm_12 |   18.85275   1.810463    10.41   0.000     15.28879    22.41671
   _Ifirm_13 |   15.35672   1.479729    10.38   0.000     12.44382    18.26961
   _Ifirm_14 |    1.86778   1.248023     1.50   0.136    -.5889948    4.324555
   _Ifirm_15 |   .8656447   1.243588     0.70   0.487    -1.582401    3.313691
   _Ifirm_16 |   2.389062   1.243558     1.92   0.056    -.0589231    4.837048
   _Ifirm_17 |   5.878602   1.362299     4.32   0.000      3.19687    8.560334
   _Ifirm_18 |  -.1611803   1.242575    -0.13   0.897    -2.607231    2.284871
   _Ifirm_19 |  -7.022735   2.487091    -2.82   0.005    -11.91866   -2.126812
   _Ifirm_20 |  -.7485875   1.242341    -0.60   0.547    -3.194178    1.697003
   _Ifirm_21 |   3.765409   1.298855     2.90   0.004      1.20857    6.322249
   _Ifirm_22 |   19.86548   1.857447    10.70   0.000     16.20904    23.52193
   _Ifirm_23 |   3.233199   1.258974     2.57   0.011     .7548653    5.711533
   _Ifirm_24 |   4.011974   1.246077     3.22   0.001     1.559029    6.464919
   _Ifirm_25 |   4.976779   1.261038     3.95   0.000     2.494384    7.459175
   _Ifirm_26 |   14.46737   1.260542    11.48   0.000     11.98595    16.94879
   _Ifirm_27 |     3.1897   1.253165     2.55   0.011     .7228012    5.656599
   _Ifirm_28 |   9.331737   1.258119     7.42   0.000     6.855088    11.80839
   _Ifirm_29 |   4.665479   1.290835     3.61   0.000     2.124427    7.206532
   _Ifirm_30 |   .4595874    1.24817     0.37   0.713    -1.997477    2.916652
   _Ifirm_31 |   3.860398   1.256122     3.07   0.002     1.387679    6.333117
       _cons |    .355786   .8855306     0.40   0.688    -1.387411    2.098983
------------------------------------------------------------------------------

. vif
```

```
    Variable |       VIF       1/VIF  
-------------+----------------------
          oe |     10.53    0.095001
   _Ifirm_19 |      7.76    0.128916
   _Ifirm_22 |      4.33    0.231131
   _Ifirm_12 |      4.11    0.243283
    _Ifirm_2 |      3.22    0.310692
   _Ifirm_13 |      2.75    0.364188
   _Ifirm_17 |      2.33    0.429680
   _Ifirm_10 |      2.28    0.438029
   _Ifirm_21 |      2.12    0.472682
   _Ifirm_29 |      2.09    0.478574
    _Ifirm_7 |      2.07    0.483096
    _Ifirm_5 |      2.05    0.487222
    _Ifirm_6 |      2.00    0.498997
   _Ifirm_25 |      1.99    0.501457
   _Ifirm_26 |      1.99    0.501852
   _Ifirm_23 |      1.99    0.503102
   _Ifirm_28 |      1.98    0.503787
   _Ifirm_31 |      1.98    0.505390
    _Ifirm_9 |      1.98    0.506229
   _Ifirm_27 |      1.97    0.507778
   _Ifirm_30 |      1.95    0.511850
   _Ifirm_14 |      1.95    0.511971
   _Ifirm_24 |      1.95    0.513571
    _Ifirm_4 |      1.95    0.513618
    _Ifirm_8 |      1.94    0.514493
   _Ifirm_11 |      1.94    0.514534
   _Ifirm_15 |      1.94    0.515628
   _Ifirm_16 |      1.94    0.515654
    _Ifirm_3 |      1.94    0.516462
   _Ifirm_18 |      1.94    0.516470
   _Ifirm_20 |      1.94    0.516664
-------------+----------------------
    Mean VIF |      2.67

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   163.70
         Prob > chi2  =   0.0000

. xtgls env oe i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       310
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =        10
                                                Wald chi2(31)      =   2529.37
Log likelihood             =  -739.715          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
```

env	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
oe	.014213	.0018935	7.51	0.000	.0105018	.0179242
firm						
2	3.326518	1.517126	2.19	0.028	.3530057	6.30003
3	10.53232	1.176704	8.95	0.000	8.226025	12.83862
4	3.17855	1.179958	2.69	0.007	.8658746	5.491225
5	2.678115	1.211499	2.21	0.027	.3036201	5.05261
6	9.264847	1.19712	7.74	0.000	6.918534	11.61116
7	8.028818	1.216662	6.60	0.000	5.644205	10.41343
8	.0650484	1.178955	0.06	0.956	-2.24566	2.375757
9	2.068871	1.188538	1.74	0.082	-.2606215	4.398364
10	.3937679	1.277718	0.31	0.758	-2.110514	2.89805
11	1.834024	1.178908	1.56	0.120	-.476593	4.14464
12	18.85275	1.714475	11.00	0.000	15.49244	22.21306
13	15.35672	1.401276	10.96	0.000	12.61027	18.10317
14	1.86778	1.181855	1.58	0.114	-.4486121	4.184172
15	.8656447	1.177655	0.74	0.462	-1.442518	3.173807
16	2.389062	1.177626	2.03	0.042	.0809573	4.697167
17	5.878602	1.290072	4.56	0.000	3.350107	8.407097
18	-.1611803	1.176696	-0.14	0.891	-2.467461	2.145101
19	-7.022735	2.355229	-2.98	0.003	-11.6389	-2.40657
20	-.7485875	1.176474	-0.64	0.525	-3.054435	1.55726
21	3.765409	1.229992	3.06	0.002	1.35467	6.176148
22	19.86548	1.758968	11.29	0.000	16.41797	23.313
23	3.233199	1.192226	2.71	0.007	.8964799	5.569919
24	4.011974	1.180012	3.40	0.001	1.699192	6.324755
25	4.976779	1.19418	4.17	0.000	2.63623	7.317328
26	14.46737	1.19371	12.12	0.000	12.12774	16.807
27	3.1897	1.186725	2.69	0.007	.8637624	5.515637
28	9.331737	1.191415	7.83	0.000	6.996607	11.66687
29	4.665479	1.222397	3.82	0.000	2.269625	7.061334
30	.4595874	1.181994	0.39	0.697	-1.857078	2.776253
31	3.860398	1.189525	3.25	0.001	1.528973	6.191823
_cons	.355786	.8385812	0.42	0.671	-1.287803	1.999375

```
.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Independent 2001-2010.log
  log type:  text
 closed on:   8 Jul 2012, 19:14:46
```

Appendix F: Environment as the Dependent Variable 2001-2005

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Environment as
Dependent 2001-2005.log
  log type:  text
 opened on:  25 Jun 2012, 19:28:50

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2005
                delta:  1 unit


. xi: reg revenuetotal environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  408.56
       Model |  30180998.5    31  973580.598           Prob > F      =  0.0000
    Residual |  293102.836   123  2382.94989           R-squared     =  0.9904
-------------+------------------------------           Adj R-squared =  0.9880
       Total |  30474101.4   154  197883.775           Root MSE      =  48.815

------------------------------------------------------------------------------
revenuetotal |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   7.334845   1.797827     4.08   0.000     3.776156    10.89353
    _Ifirm_2 |   1109.318   34.70845    31.96   0.000     1040.614    1178.021
    _Ifirm_3 |  -121.0555   35.40492    -3.42   0.001    -191.1374   -50.97364
    _Ifirm_4 |   77.46777   31.38878     2.47   0.015     15.33561    139.5999
    _Ifirm_5 |    155.535   32.17885     4.83   0.000     91.83892     219.231
    _Ifirm_6 |   818.0004   36.35783    22.50   0.000     746.0323    889.9685
    _Ifirm_7 |   373.0331   35.40492    10.54   0.000     302.9512     443.115
    _Ifirm_8 |  -35.31904   30.89458    -1.14   0.255    -96.47297    25.83488
    _Ifirm_9 |   78.60082   31.35013     2.51   0.013     16.54516    140.6565
   _Ifirm_10 |   205.3015   32.15041     6.39   0.000     141.6617    268.9412
   _Ifirm_11 |   42.00689   31.00981     1.35   0.178    -19.37512    103.3889
   _Ifirm_12 |   1627.699   56.76617    28.67   0.000     1515.334    1740.064
   _Ifirm_13 |   831.1352   45.70489    18.18   0.000     740.6652    921.6052
   _Ifirm_14 |   87.80092   31.55382     2.78   0.006     25.34207    150.2598
   _Ifirm_15 |   44.56721   30.94755     1.44   0.152    -16.69157     105.826
   _Ifirm_16 |  -16.02168   31.13921    -0.51   0.608    -77.65985    45.61649
   _Ifirm_17 |   700.4289   34.38899    20.37   0.000      632.358    768.4998
   _Ifirm_18 |  -22.16522     30.875    -0.72   0.474     -83.2804    38.94996
   _Ifirm_19 |   704.4666   33.01324    21.34   0.000      639.119    769.8143
   _Ifirm_20 |   .4063622   30.90416     0.01   0.990    -60.76652    61.57924
   _Ifirm_21 |    619.532   31.32152    19.78   0.000     557.5329     681.531
   _Ifirm_22 |   863.4278   53.38588    16.17   0.000     757.7538    969.1019
   _Ifirm_23 |   142.9006    31.5653     4.53   0.000     80.41903    205.3822
   _Ifirm_24 |   28.24007   31.56568     0.89   0.373    -34.24225    90.72239
   _Ifirm_25 |     102.27   32.74684     3.12   0.002     37.44958    167.0903
   _Ifirm_26 |   319.6473   36.07087     8.86   0.000     248.2472    391.0474
   _Ifirm_27 |   108.7331   31.67201     3.43   0.001     46.04026    171.4259
```

```
    _Ifirm_28 |   378.7096   35.25112    10.74   0.000     308.9322     448.487
    _Ifirm_29 |   258.6753   32.71128     7.91   0.000     193.9253    323.4253
    _Ifirm_30 |   32.68169   30.94582     1.06   0.293    -28.57367    93.93705
    _Ifirm_31 |   54.89261   31.81553     1.73   0.087    -8.084285    117.8695
        _cons |   76.02998   21.91626     3.47   0.001     32.64809    119.4119
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
environmen~l |      9.81    0.101925
   _Ifirm_12 |      6.54    0.152829
   _Ifirm_22 |      5.79    0.172796
   _Ifirm_13 |      4.24    0.235754
    _Ifirm_6 |      2.68    0.372554
   _Ifirm_26 |      2.64    0.378505
    _Ifirm_3 |      2.55    0.392878
    _Ifirm_7 |      2.55    0.392878
   _Ifirm_28 |      2.52    0.396314
    _Ifirm_2 |      2.45    0.408804
   _Ifirm_17 |      2.40    0.416434
   _Ifirm_19 |      2.21    0.451865
   _Ifirm_25 |      2.18    0.459247
   _Ifirm_29 |      2.17    0.460246
    _Ifirm_5 |      2.10    0.475603
   _Ifirm_10 |      2.10    0.476445
   _Ifirm_31 |      2.06    0.486527
   _Ifirm_27 |      2.04    0.490947
   _Ifirm_24 |      2.02    0.494260
   _Ifirm_23 |      2.02    0.494271
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of revenuetotal

         chi2(1)      =   269.66
         Prob > chi2  =   0.0000

. xtgls revenuetotal environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
```

```
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =  15960.46
Log likelihood             = -804.6616          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
 revenuetotal |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   7.334845   1.601529     4.58   0.000     4.195906    10.47378
             |
         firm |
           2  |   1109.318   30.91875    35.88   0.000     1048.718    1169.917
           3  |  -121.0555   31.53917    -3.84   0.000    -182.8711   -59.23986
           4  |   77.46777   27.96154     2.77   0.006     22.66415    132.2714
           5  |    155.535   28.66535     5.43   0.000     99.35193     211.718
           6  |   818.0004   32.38804    25.26   0.000      754.521    881.4798
           7  |   373.0331   31.53917    11.83   0.000     311.2175    434.8487
           8  |  -35.31904    27.5213    -1.28   0.199    -89.25981    18.62172
           9  |   78.60082   27.92712     2.81   0.005     23.86468     133.337
          10  |   205.3015   28.64001     7.17   0.000     149.1681    261.4348
          11  |   42.00689   27.62395     1.52   0.128    -12.13505    96.14884
          12  |   1627.699   50.56807    32.19   0.000     1528.588    1726.811
          13  |   831.1352   40.71453    20.41   0.000     751.3362    910.9342
          14  |   87.80092   28.10856     3.12   0.002     32.70915    142.8927
          15  |   44.56721   27.56849     1.62   0.106    -9.466044    98.60045
          16  |  -16.02168   27.73923    -0.58   0.564    -70.38957    38.34621
          17  |   700.4289   30.63417    22.86   0.000     640.3871    760.4708
          18  |  -22.16522   27.50386    -0.81   0.420     -76.0718    31.74136
          19  |   704.4666   29.40864    23.95   0.000     646.8268    762.1065
          20  |   .4063622   27.52983     0.01   0.988    -53.55112    54.36384
          21  |    619.532   27.90163    22.20   0.000     564.8458    674.2182
          22  |   863.4278   47.55685    18.16   0.000     770.2181    956.6375
          23  |   142.9006   28.11879     5.08   0.000     87.78879    198.0124
          24  |   28.24007   28.11912     1.00   0.315     -26.8724    83.35254
          25  |     102.27   29.17132     3.51   0.000     45.09521    159.4447
          26  |   319.6473   32.13241     9.95   0.000      256.669    382.6257
          27  |   108.7331   28.21384     3.85   0.000     53.43494    164.0312
          28  |   378.7096   31.40216    12.06   0.000     317.1625    440.2567
          29  |   258.6753   29.13964     8.88   0.000     201.5627     315.788
          30  |   32.68169   27.56695     1.19   0.236    -21.34854    86.71192
          31  |   54.89261    28.3417     1.94   0.053    -.6561013    110.4413
             |
        _cons |   76.02998    19.5233     3.89   0.000     37.76502    114.2949
------------------------------------------------------------------------------

.
. xi: reg costofsales environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  343.72
       Model |  15026695.5    31  484732.112           Prob > F      =  0.0000
    Residual |  173463.205   123  1410.26996           R-squared     =  0.9886
-------------+------------------------------           Adj R-squared =  0.9857
       Total |  15200158.7   154   98702.329           Root MSE      =  37.554

------------------------------------------------------------------------------
```

costofsales	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
environmental	5.925734	1.383062	4.28	0.000	3.188047	8.663421
_Ifirm_2	737.3007	26.70108	27.61	0.000	684.4475	790.1538
_Ifirm_3	-95.27312	27.23687	-3.50	0.001	-149.1868	-41.3594
_Ifirm_4	40.49215	24.14727	1.68	0.096	-7.305891	88.2902
_Ifirm_5	89.34135	24.75507	3.61	0.000	40.3402	138.3425
_Ifirm_6	590.0224	27.96995	21.09	0.000	534.6576	645.3872
_Ifirm_7	246.9863	27.23687	9.07	0.000	193.0726	300.9
_Ifirm_8	-23.44421	23.76709	-0.99	0.326	-70.4897	23.60128
_Ifirm_9	43.76574	24.11754	1.81	0.072	-3.973459	91.50493
_Ifirm_10	128.5586	24.73319	5.20	0.000	79.60072	177.5164
_Ifirm_11	25.09693	23.85573	1.05	0.295	-22.12403	72.31788
_Ifirm_12	1133.066	43.67001	25.95	0.000	1046.624	1219.508
_Ifirm_13	594.2398	35.16061	16.90	0.000	524.6415	663.838
_Ifirm_14	45.90399	24.27424	1.89	0.061	-2.14538	93.95335
_Ifirm_15	28.54032	23.80784	1.20	0.233	-18.58584	75.66647
_Ifirm_16	-17.52975	23.95528	-0.73	0.466	-64.94777	29.88826
_Ifirm_17	477.0355	26.45532	18.03	0.000	424.6688	529.4022
_Ifirm_18	-18.0807	23.75203	-0.76	0.448	-65.09639	28.93498
_Ifirm_19	447.813	25.39697	17.63	0.000	397.5412	498.0847
_Ifirm_20	-1.257464	23.77445	-0.05	0.958	-48.31754	45.80261
_Ifirm_21	483.2682	24.09553	20.06	0.000	435.5726	530.9639
_Ifirm_22	541.4777	41.06956	13.18	0.000	460.183	622.7724
_Ifirm_23	86.78327	24.28307	3.57	0.001	38.71642	134.8501
_Ifirm_24	9.996149	24.28336	0.41	0.681	-38.07127	58.06357
_Ifirm_25	46.22896	25.19203	1.84	0.069	-3.637119	96.09503
_Ifirm_26	225.4769	27.74919	8.13	0.000	170.5491	280.4047
_Ifirm_27	78.38431	24.36516	3.22	0.002	30.15498	126.6137
_Ifirm_28	281.8738	27.11856	10.39	0.000	228.1943	335.5533
_Ifirm_29	160.9749	25.16467	6.40	0.000	111.163	210.7869
_Ifirm_30	5.746679	23.80651	0.24	0.810	-41.37684	52.8702
_Ifirm_31	33.80543	24.47557	1.38	0.170	-14.64247	82.25332
_cons	53.55541	16.8601	3.18	0.002	20.18188	86.92894

. vif

Variable	VIF	1/VIF
environmen~l	9.81	0.101925
_Ifirm_12	6.54	0.152829
_Ifirm_22	5.79	0.172796
_Ifirm_13	4.24	0.235754
_Ifirm_6	2.68	0.372554
_Ifirm_26	2.64	0.378505
_Ifirm_3	2.55	0.392878
_Ifirm_7	2.55	0.392878
_Ifirm_28	2.52	0.396314
_Ifirm_2	2.45	0.408804
_Ifirm_17	2.40	0.416434
_Ifirm_19	2.21	0.451865
_Ifirm_25	2.18	0.459247
_Ifirm_29	2.17	0.460246
_Ifirm_5	2.10	0.475603
_Ifirm_10	2.10	0.476445
_Ifirm_31	2.06	0.486527
_Ifirm_27	2.04	0.490947
_Ifirm_24	2.02	0.494260
_Ifirm_23	2.02	0.494271

```
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of costofsales

         chi2(1)      =   275.77
         Prob > chi2  =   0.0000

. xtgls costofsales environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =  13427.27
Log likelihood             = -764.0084          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  costofsales |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   5.925734    1.23205     4.81   0.000      3.51096    8.340508
              |
         firm |
            2 |   737.3007   23.78568    31.00   0.000     690.6816    783.9198
            3 |  -95.27312   24.26297    -3.93   0.000    -142.8277   -47.71857
            4 |   40.49215   21.51071     1.88   0.060    -1.668067    82.65237
            5 |   89.34135   22.05215     4.05   0.000     46.11993    132.5628
            6 |   590.0224     24.916    23.68   0.000     541.1879    638.8569
            7 |   246.9863   24.26297    10.18   0.000     199.4317    294.5408
            8 |  -23.44421   21.17204    -1.11   0.268    -64.94064    18.05222
            9 |   43.76574   21.48423     2.04   0.042     1.657423    85.87405
           10 |   128.5586   22.03266     5.83   0.000     85.37534    171.7418
           11 |   25.09693     21.251     1.18   0.238    -16.55427    66.74813
           12 |   1133.066   38.90183    29.13   0.000      1056.82    1209.312
           13 |   594.2398   31.32154    18.97   0.000     532.8507    655.6288
           14 |   45.90399   21.62381     2.12   0.034     3.522087    88.28588
           15 |   28.54032   21.20834     1.35   0.178    -13.02726     70.1079
           16 |  -17.52975   21.33969    -0.82   0.411    -59.35477    24.29527
           17 |   477.0355   23.56675    20.24   0.000     430.8455    523.2255
           18 |   -18.0807   21.15862    -0.85   0.393    -59.55084    23.38943
```

```
          19 |    447.813   22.62396    19.79   0.000     403.4708    492.1551
          20 |  -1.257464    21.1786    -0.06   0.953    -42.76676    40.25183
          21 |   483.2682   21.46462    22.51   0.000     441.1983    525.3381
          22 |   541.4777   36.58531    14.80   0.000     469.7718    613.1836
          23 |   86.78327   21.63168     4.01   0.000     44.38595    129.1806
          24 |   9.996149   21.63194     0.46   0.644    -32.40167    52.39397
          25 |   46.22896   22.44139     2.06   0.039     2.244631    90.21328
          26 |   225.4769   24.71935     9.12   0.000     177.0279     273.926
          27 |   78.38431   21.70481     3.61   0.000     35.84367     120.925
          28 |   281.8738   24.15757    11.67   0.000     234.5258    329.2218
          29 |   160.9749   22.41702     7.18   0.000     117.0384    204.9115
          30 |   5.746679   21.20715     0.27   0.786    -35.81858    47.31194
          31 |   33.80543   21.80317     1.55   0.121    -8.927993    76.53885
             |
       _cons |   53.55541    15.0192     3.57   0.000     24.11831     82.9925
--------------------------------------------------------------------------------

.
. xi: reg netincome environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =    5.84
       Model |  34021.0847    31  1097.45434           Prob > F      =  0.0000
    Residual |  23128.1793   123  188.033978           R-squared     =  0.5953
-------------+------------------------------           Adj R-squared =  0.4933
       Total |   57149.264   154  371.099117           Root MSE      =  13.713

--------------------------------------------------------------------------------
    netincome |      Coef.   Std. Err.      t    P>|t|      [95% Conf. Interval]
-------------+------------------------------------------------------------------
environmental |   1.702801   .5050202     3.37   0.001     .7031445    2.702458
     _Ifirm_2 |  -9.985808   9.749804    -1.02   0.308    -29.28495    9.313332
     _Ifirm_3 |  -21.00458   9.945446    -2.11   0.037    -40.69098   -1.318179
     _Ifirm_4 |  -.0369636    8.81729    -0.00   0.997    -17.49025    17.41632
     _Ifirm_5 |  -8.085534   9.039225    -0.89   0.373    -25.97813    9.807057
     _Ifirm_6 |  -14.94254   10.21313    -1.46   0.146    -35.15879    5.273721
     _Ifirm_7 |   -7.65658   9.945446    -0.77   0.443    -27.34298    12.02982
     _Ifirm_8 |  -2.574927   8.678467    -0.30   0.767    -19.75342    14.60357
     _Ifirm_9 |  -3.177444   8.806434    -0.36   0.719    -20.60924    14.25435
    _Ifirm_10 |  -3.278496   9.031236    -0.36   0.717    -21.15527    14.59828
    _Ifirm_11 |  -4.485083   8.710835    -0.51   0.608    -21.72765    12.75748
    _Ifirm_12 |  -35.77644   15.94595    -2.24   0.027    -67.34046   -4.212411
    _Ifirm_13 |  -19.68389   12.83877    -1.53   0.128    -45.09744     5.72967
    _Ifirm_14 |  -5.552973   8.863651    -0.63   0.532    -23.09803    11.99208
    _Ifirm_15 |  -2.759571   8.693347    -0.32   0.751    -19.96752    14.44838
    _Ifirm_16 |  -4.957503   8.747186    -0.57   0.572    -22.27202    12.35702
    _Ifirm_17 |   -29.6775   9.660066    -3.07   0.003    -48.79901   -10.55599
    _Ifirm_18 |  -3.389643   8.672968    -0.39   0.697    -20.55725    13.77796
    _Ifirm_19 |   59.22334   9.273612     6.39   0.000      40.8668    77.57989
    _Ifirm_20 |   -.016781   8.681157    -0.00   0.998     -17.2006    17.16704
    _Ifirm_21 |  -7.037683   8.798398    -0.80   0.425    -24.45357    10.37821
    _Ifirm_22 |  -6.915836    14.9964    -0.46   0.645    -36.60029    22.76862
    _Ifirm_23 |  -5.679619   8.866876    -0.64   0.523    -23.23106    11.87182
    _Ifirm_24 |  -7.276122   8.866981    -0.82   0.413    -24.82777    10.27552
    _Ifirm_25 |  -9.947948   9.198779    -1.08   0.282    -28.15637     8.26047
    _Ifirm_26 |   -11.8727   10.13252    -1.17   0.244     -31.9294    8.183995
    _Ifirm_27 |   -8.55303    8.89685    -0.96   0.338     -26.1638     9.05774
    _Ifirm_28 |  -18.09369   9.902243    -1.83   0.070    -37.69457    1.507196
    _Ifirm_29 |  -.0116614   9.188788    -0.00   0.999     -18.2003    18.17698
```

```
    _Ifirm_30 |  -2.593932   8.692861    -0.30   0.766    -19.80092    14.61305
    _Ifirm_31 |  -5.206712   8.937167    -0.58   0.561    -22.89729    12.48386
        _cons |    2.67377   6.156404     0.43   0.665    -9.512455    14.85999
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
environmen~l |      9.81    0.101925
   _Ifirm_12 |      6.54    0.152829
   _Ifirm_22 |      5.79    0.172796
   _Ifirm_13 |      4.24    0.235754
    _Ifirm_6 |      2.68    0.372554
   _Ifirm_26 |      2.64    0.378505
    _Ifirm_3 |      2.55    0.392878
    _Ifirm_7 |      2.55    0.392878
   _Ifirm_28 |      2.52    0.396314
    _Ifirm_2 |      2.45    0.408804
   _Ifirm_17 |      2.40    0.416434
   _Ifirm_19 |      2.21    0.451865
   _Ifirm_25 |      2.18    0.459247
   _Ifirm_29 |      2.17    0.460246
    _Ifirm_5 |      2.10    0.475603
   _Ifirm_10 |      2.10    0.476445
   _Ifirm_31 |      2.06    0.486527
   _Ifirm_27 |      2.04    0.490947
   _Ifirm_24 |      2.02    0.494260
   _Ifirm_23 |      2.02    0.494271
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of netincome

         chi2(1)      =     0.04
         Prob > chi2  =   0.8330

. xtgls netincome environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =    228.00
Log likelihood             = -607.8526          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
   netincome |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   1.702801   .4498787     3.79   0.000      .821055    2.584547
             |
        firm |
          2  |  -9.985808   8.685256    -1.15   0.250     -27.0086     7.03698
          3  |  -21.00458   8.859536    -2.37   0.018    -38.36895   -3.640208
          4  |  -.0369636   7.854559    -0.00   0.996    -15.43162    15.35769
          5  |  -8.085534   8.052262    -1.00   0.315    -23.86768     7.69661
          6  |  -14.94254   9.097989    -1.64   0.101    -32.77427    2.889194
          7  |   -7.65658   8.859536    -0.86   0.387    -25.02095    9.707792
          8  |  -2.574927   7.730894    -0.33   0.739     -17.7272    12.57735
          9  |  -3.177444   7.844889    -0.41   0.685    -18.55314    12.19826
         10  |  -3.278496   8.045146    -0.41   0.684    -19.04669     12.4897
         11  |  -4.485083   7.759728    -0.58   0.563    -19.69387     10.7237
         12  |  -35.77644   14.20486    -2.52   0.012    -63.61746   -7.935417
         13  |  -19.68389   11.43695    -1.72   0.085    -42.09989    2.732117
         14  |  -5.552973   7.895858    -0.70   0.482    -21.02857    9.922625
         15  |  -2.759571   7.744149    -0.36   0.722    -17.93782    12.41868
         16  |  -4.957503    7.79211    -0.64   0.525    -20.22976    10.31475
         17  |   -29.6775   8.605315    -3.45   0.001    -46.54361   -12.81139
         18  |  -3.389643   7.725995    -0.44   0.661    -18.53232    11.75303
         19  |   59.22334   8.261057     7.17   0.000     43.03197    75.41472
         20  |   -.016781    7.73329    -0.00   0.998    -15.17375    15.14019
         21  |  -7.037683    7.83773    -0.90   0.369    -22.39935    8.323986
         22  |  -6.915836   13.35899    -0.52   0.605    -33.09898    19.26731
         23  |  -5.679619   7.898732    -0.72   0.472    -21.16085     9.80161
         24  |  -7.276122   7.898825    -0.92   0.357    -22.75753    8.205291
         25  |  -9.947948   8.194394    -1.21   0.225    -26.00867     6.11277
         26  |   -11.8727   9.026181    -1.32   0.188    -29.56369    5.818289
         27  |   -8.55303   7.925433    -1.08   0.281    -24.08659    6.980533
         28  |  -18.09369    8.82105    -2.05   0.040    -35.38263   -.8047466
         29  |  -.0116614   8.185495    -0.00   0.999    -16.05494    16.03161
         30  |  -2.593932   7.743716    -0.33   0.738    -17.77134    12.58347
         31  |  -5.206712   7.961348    -0.65   0.513    -20.81067    10.39724
             |
       _cons |    2.67377   5.484207     0.49   0.626    -8.075078    13.42262
------------------------------------------------------------------------------

.
. xi: reg totalca environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  472.79
       Model |  7525324.58    31  242752.406           Prob > F      =  0.0000
    Residual |  63154.0097   123  513.447234           R-squared     =  0.9917
-------------+------------------------------           Adj R-squared =  0.9896
       Total |  7588478.59   154   49275.835           Root MSE      =  22.659

------------------------------------------------------------------------------
     totalca |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

environmental	.2316711	.8345233	0.28	0.782	-1.420217	1.883559
_Ifirm_2	523.787	16.11112	32.51	0.000	491.8961	555.678
_Ifirm_3	-24.04417	16.43441	-1.46	0.146	-56.57507	8.48673
_Ifirm_4	44.30179	14.57018	3.04	0.003	15.46101	73.14256
_Ifirm_5	101.356	14.93692	6.79	0.000	71.78928	130.9227
_Ifirm_6	371.2246	16.87674	22.00	0.000	337.8182	404.6311
_Ifirm_7	170.8792	16.43441	10.40	0.000	138.3483	203.4101
_Ifirm_8	-20.67275	14.34078	-1.44	0.152	-49.05945	7.71394
_Ifirm_9	58.71651	14.55224	4.03	0.000	29.91125	87.52178
_Ifirm_10	144.0945	14.92371	9.66	0.000	114.5539	173.635
_Ifirm_11	20.7207	14.39427	1.44	0.153	-7.77187	49.21326
_Ifirm_12	859.3097	26.34997	32.61	0.000	807.1516	911.4679
_Ifirm_13	431.9698	21.21549	20.36	0.000	389.9751	473.9646
_Ifirm_14	69.78548	14.64679	4.76	0.000	40.79307	98.7779
_Ifirm_15	24.4233	14.36537	1.70	0.092	-4.012067	52.85866
_Ifirm_16	7.607826	14.45433	0.53	0.600	-21.00364	36.2193
_Ifirm_17	233.8364	15.96283	14.65	0.000	202.2389	265.4338
_Ifirm_18	-5.029639	14.33169	-0.35	0.726	-33.39834	23.33907
_Ifirm_19	671.6196	15.32423	43.83	0.000	641.2862	701.953
_Ifirm_20	3.198407	14.34522	0.22	0.824	-25.19708	31.5939
_Ifirm_21	241.6855	14.53896	16.62	0.000	212.9065	270.4644
_Ifirm_22	574.1141	24.78089	23.17	0.000	525.0618	623.1663
_Ifirm_23	71.06675	14.65212	4.85	0.000	42.06378	100.0697
_Ifirm_24	23.79732	14.65229	1.62	0.107	-5.205993	52.80063
_Ifirm_25	79.23025	15.20057	5.21	0.000	49.14165	109.3188
_Ifirm_26	182.2648	16.74353	10.89	0.000	149.122	215.4076
_Ifirm_27	86.55579	14.70165	5.89	0.000	57.45478	115.6568
_Ifirm_28	230.1912	16.36301	14.07	0.000	197.8016	262.5808
_Ifirm_29	141.1755	15.18406	9.30	0.000	111.1195	171.2314
_Ifirm_30	45.76114	14.36457	3.19	0.002	17.32737	74.19492
_Ifirm_31	50.01079	14.76827	3.39	0.001	20.7779	79.24368
_cons	50.02445	10.17318	4.92	0.000	29.88725	70.16164

. vif

Variable	VIF	1/VIF
environmen~l	9.81	0.101925
_Ifirm_12	6.54	0.152829
_Ifirm_22	5.79	0.172796
_Ifirm_13	4.24	0.235754
_Ifirm_6	2.68	0.372554
_Ifirm_26	2.64	0.378505
_Ifirm_3	2.55	0.392878
_Ifirm_7	2.55	0.392878
_Ifirm_28	2.52	0.396314
_Ifirm_2	2.45	0.408804
_Ifirm_17	2.40	0.416434
_Ifirm_19	2.21	0.451865
_Ifirm_25	2.18	0.459247
_Ifirm_29	2.17	0.460246
_Ifirm_5	2.10	0.475603
_Ifirm_10	2.10	0.476445
_Ifirm_31	2.06	0.486527
_Ifirm_27	2.04	0.490947
_Ifirm_24	2.02	0.494260
_Ifirm_23	2.02	0.494271
_Ifirm_14	2.02	0.494631
_Ifirm_4	2.00	0.499846

```
     _Ifirm_9 |      2.00    0.501079
    _Ifirm_21 |      1.99    0.501995
    _Ifirm_16 |      1.97    0.507890
    _Ifirm_11 |      1.95    0.512138
    _Ifirm_15 |      1.94    0.514201
    _Ifirm_30 |      1.94    0.514258
    _Ifirm_20 |      1.94    0.515646
     _Ifirm_8 |      1.94    0.515966
    _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of totalca

         chi2(1)      =   104.98
         Prob > chi2  =   0.0000

. xtgls totalca environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =  18469.54
Log likelihood             = -685.7032          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     totalca |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   .2316711   .7434045     0.31   0.755    -1.225375    1.688717
             |
        firm |
          2  |    523.787     14.352    36.50   0.000     495.6576    551.9164
          3  |  -24.04417   14.63999    -1.64   0.101    -52.73802     4.64968
          4  |   44.30179   12.97931     3.41   0.001     18.86281    69.74077
          5  |    101.356     13.306     7.62   0.000      75.2767    127.4353
          6  |   371.2246   15.03402    24.69   0.000     341.7585    400.6908
          7  |   170.8792   14.63999    11.67   0.000     142.1854    199.5731
          8  |  -20.67275   12.77496    -1.62   0.106    -45.71121    4.365703
          9  |   58.71651   12.96333     4.53   0.000     33.30886    84.12417
         10  |   144.0945   13.29424    10.84   0.000     118.0382    170.1507
         11  |    20.7207    12.8226     1.62   0.106    -4.411145    45.85254
         12  |   859.3097    23.4729    36.61   0.000     813.3037    905.3158
         13  |   431.9698   18.89904    22.86   0.000     394.9284    469.0113
         14  |   69.78548   13.04755     5.35   0.000     44.21275    95.35822
         15  |    24.4233   12.79686     1.91   0.056    -.6580896    49.50468
         16  |   7.607826   12.87611     0.59   0.555    -17.62889    32.84455
         17  |   233.8364    14.2199    16.44   0.000     205.9659    261.7069
         18  |  -5.029639   12.76686    -0.39   0.694    -30.05223    19.99295
         19  |   671.6196   13.65103    49.20   0.000     644.8641    698.3751
         20  |   3.198407   12.77892     0.25   0.802    -21.84781    28.24462
```

```
          21 |   241.6855    12.9515    18.66   0.000      216.301    267.0699
          22 |   574.1141   22.07514    26.01   0.000     530.8476    617.3806
          23 |   71.06675    13.0523     5.44   0.000     45.48471    96.64879
          24 |   23.79732   13.05246     1.82   0.068    -1.785025    49.37966
          25 |   79.23025   13.54087     5.85   0.000     52.69063    105.7699
          26 |   182.2648   14.91536    12.22   0.000     153.0312    211.4983
          27 |   86.55579   13.09642     6.61   0.000     60.88727    112.2243
          28 |   230.1912   14.57639    15.79   0.000      201.622    258.7604
          29 |   141.1755   13.52617    10.44   0.000     114.6647    167.6863
          30 |   45.76114   12.79615     3.58   0.000     20.68116    70.84113
          31 |   50.01079   13.15577     3.80   0.000     24.22595    75.79563
             |
       _cons |   50.02445   9.062407     5.52   0.000     32.26245    67.78644
------------------------------------------------------------------------------

.
. xi: reg totalassets environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  702.77
       Model |  39670405.8    31  1279690.51           Prob > F      =  0.0000
    Residual |  223972.847   123  1820.91746           R-squared     =  0.9944
-------------+------------------------------           Adj R-squared =  0.9930
       Total |  39894378.7   154  259054.407           Root MSE      =  42.672

------------------------------------------------------------------------------
 totalassets |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |  -1.807099   1.571577    -1.15   0.252     -4.91794    1.303741
    _Ifirm_2 |   1175.759   30.34051    38.75   0.000     1115.702    1235.816
    _Ifirm_3 |   1.854354   30.94933     0.06   0.952    -59.40795    63.11665
    _Ifirm_4 |   157.1489   27.43861     5.73   0.000     102.8359     211.462
    _Ifirm_5 |   342.1176   28.12925    12.16   0.000     286.4375    397.7977
    _Ifirm_6 |   1008.226   31.78232    31.72   0.000     945.3147    1071.137
    _Ifirm_7 |   361.9057   30.94933    11.69   0.000     300.6434    423.1681
    _Ifirm_8 |   -33.0111    27.0066    -1.22   0.224    -86.46901    20.44682
    _Ifirm_9 |   138.8369   27.40483     5.07   0.000     84.59077    193.0831
   _Ifirm_10 |   394.8951   28.10439    14.05   0.000     339.2642     450.526
   _Ifirm_11 |   109.7045   27.10733     4.05   0.000     56.04721    163.3618
   _Ifirm_12 |   2045.137   49.62235    41.21   0.000     1946.912    2143.361
   _Ifirm_13 |   1207.007   39.95309    30.21   0.000     1127.922    1286.091
   _Ifirm_14 |   157.5996   27.58288     5.71   0.000      103.001    212.1982
   _Ifirm_15 |   110.3874   27.05291     4.08   0.000     56.83783     163.937
   _Ifirm_16 |   45.32675   27.22045     1.67   0.098    -8.554469    99.20796
   _Ifirm_17 |   737.6932   30.06125    24.54   0.000     678.1888    797.1976
   _Ifirm_18 |   5.426642   26.98949     0.20   0.841     -47.9974    58.85068
   _Ifirm_19 |   1284.154   28.85864    44.50   0.000      1227.03    1341.277
   _Ifirm_20 |   7.172092   27.01497     0.27   0.791    -46.30239    60.64658
   _Ifirm_21 |   909.6801   27.37982    33.22   0.000     855.4834    963.8768
   _Ifirm_22 |   1476.849   46.66745    31.65   0.000     1384.474    1569.224
   _Ifirm_23 |   233.8055   27.59292     8.47   0.000      179.187     288.424
   _Ifirm_24 |   107.5509   27.59324     3.90   0.000     52.93174      162.17
   _Ifirm_25 |   268.7889   28.62577     9.39   0.000     212.1259    325.4518
   _Ifirm_26 |   506.6098   31.53147    16.07   0.000     444.1952    569.0244
   _Ifirm_27 |    208.278   27.68619     7.52   0.000     153.4749    263.0811
   _Ifirm_28 |   694.6215   30.81488    22.54   0.000     633.6253    755.6177
   _Ifirm_29 |   326.7204   28.59468    11.43   0.000     270.1189    383.3218
   _Ifirm_30 |   108.4159    27.0514     4.01   0.000     54.86932    161.9625
   _Ifirm_31 |   164.0139   27.81166     5.90   0.000     108.9624    219.0654
```

```
        _cons |   75.05411   19.15817     3.92   0.000     37.13168    112.9765
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
environmen~l |      9.81    0.101925
   _Ifirm_12 |      6.54    0.152829
   _Ifirm_22 |      5.79    0.172796
   _Ifirm_13 |      4.24    0.235754
    _Ifirm_6 |      2.68    0.372554
   _Ifirm_26 |      2.64    0.378505
    _Ifirm_3 |      2.55    0.392878
    _Ifirm_7 |      2.55    0.392878
   _Ifirm_28 |      2.52    0.396314
    _Ifirm_2 |      2.45    0.408804
   _Ifirm_17 |      2.40    0.416434
   _Ifirm_19 |      2.21    0.451865
   _Ifirm_25 |      2.18    0.459247
   _Ifirm_29 |      2.17    0.460246
    _Ifirm_5 |      2.10    0.475603
   _Ifirm_10 |      2.10    0.476445
   _Ifirm_31 |      2.06    0.486527
   _Ifirm_27 |      2.04    0.490947
   _Ifirm_24 |      2.02    0.494260
   _Ifirm_23 |      2.02    0.494271
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of totalassets

         chi2(1)      =   159.18
         Prob > chi2  =   0.0000

. xtgls totalassets environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
```

```
Estimated coefficients     =        32          Time periods        =          5
                                                Wald chi2(31)       =   27453.83
Log likelihood             = -783.8142          Prob > chi2         =     0.0000
```

totalassets	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
environmental	-1.807099	1.399982	-1.29	0.197	-4.551013	.9368145
firm						
2	1175.759	27.02773	43.50	0.000	1122.786	1228.733
3	1.854354	27.57008	0.07	0.946	-52.182	55.89071
4	157.1489	24.44268	6.43	0.000	109.2422	205.0557
5	342.1176	25.05791	13.65	0.000	293.005	391.2302
6	1008.226	28.31212	35.61	0.000	952.7352	1063.717
7	361.9057	27.57008	13.13	0.000	307.8694	415.9421
8	-33.0111	24.05784	-1.37	0.170	-80.1636	14.14141
9	138.8369	24.41258	5.69	0.000	90.98915	186.6847
10	394.8951	25.03577	15.77	0.000	345.8259	443.9643
11	109.7045	24.14757	4.54	0.000	62.37614	157.0329
12	2045.137	44.20425	46.27	0.000	1958.498	2131.775
13	1207.007	35.59074	33.91	0.000	1137.25	1276.763
14	157.5996	24.5712	6.41	0.000	109.4409	205.7583
15	110.3874	24.09909	4.58	0.000	63.15405	157.6208
16	45.32675	24.24834	1.87	0.062	-2.19913	92.85262
17	737.6932	26.77896	27.55	0.000	685.2074	790.179
18	5.426642	24.0426	0.23	0.821	-41.69598	52.54927
19	1284.154	25.70766	49.95	0.000	1233.767	1334.54
20	7.172092	24.0653	0.30	0.766	-39.99503	54.33921
21	909.6801	24.39031	37.30	0.000	861.876	957.4842
22	1476.849	41.57198	35.53	0.000	1395.37	1558.329
23	233.8055	24.58014	9.51	0.000	185.6293	281.9817
24	107.5509	24.58043	4.38	0.000	59.37412	155.7276
25	268.7889	25.50021	10.54	0.000	218.8094	318.7684
26	506.6098	28.08866	18.04	0.000	451.5571	561.6626
27	208.278	24.66323	8.44	0.000	159.9389	256.617
28	694.6215	27.45031	25.30	0.000	640.8199	748.4231
29	326.7204	25.47252	12.83	0.000	276.7951	376.6456
30	108.4159	24.09775	4.50	0.000	61.18519	155.6466
31	164.0139	24.77499	6.62	0.000	115.4558	212.572
_cons	75.05411	17.06636	4.40	0.000	41.60467	108.5036

```
.
. xi: reg totalcl environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)
```

Source	SS	df	MS
Model	6777452.13	31	218627.488
Residual	91912.6231	123	747.257099
Total	6869364.76	154	44606.2647

```
Number of obs =     155
F( 31,   123) =  292.57
Prob > F      =  0.0000
R-squared     =  0.9866
Adj R-squared =  0.9832
Root MSE      =  27.336
```

totalcl	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
environmental	-1.727201	1.006759	-1.72	0.089	-3.720019	.2656173
_Ifirm_2	385.03	19.43626	19.81	0.000	346.5572	423.5029

```
    _Ifirm_3 |   1.706779   19.82628     0.09   0.932    -37.53812    40.95168
    _Ifirm_4 |   66.95403   17.57729     3.81   0.000     32.16086    101.7472
    _Ifirm_5 |   101.5847   18.01972     5.64   0.000     65.91572    137.2536
    _Ifirm_6 |   454.7611    20.3599    22.34   0.000       414.46    495.0623
    _Ifirm_7 |   163.7372   19.82628     8.26   0.000     124.4923    202.9821
    _Ifirm_8 |  -7.091118   17.30055    -0.41   0.683    -41.33649    27.15426
    _Ifirm_9 |   44.62774   17.55565     2.54   0.012     9.877409    79.37808
   _Ifirm_10 |   81.14604    18.0038     4.51   0.000     45.50863    116.7835
   _Ifirm_11 |   45.15008   17.36507     2.60   0.010     10.77699    79.52318
   _Ifirm_12 |   981.2507   31.78829    30.87   0.000     918.3278    1044.174
   _Ifirm_13 |   485.1539   25.59412    18.96   0.000     434.4919    535.8159
   _Ifirm_14 |   70.64961   17.66971     4.00   0.000      35.6735    105.6257
   _Ifirm_15 |   41.42619   17.33021     2.39   0.018     7.122098    75.73028
   _Ifirm_16 |   2.329183   17.43754     0.13   0.894    -32.18736    36.84572
   _Ifirm_17 |   307.6191   19.25737    15.97   0.000     269.5003    345.7378
   _Ifirm_18 |   3.213066   17.28959     0.19   0.853    -31.01061    37.43674
   _Ifirm_19 |   312.5681   18.48697    16.91   0.000     275.9743     349.162
   _Ifirm_20 |   7.452939   17.30591     0.43   0.667    -26.80305    41.70893
   _Ifirm_21 |   399.2287   17.53963    22.76   0.000     364.5101    433.9473
   _Ifirm_22 |   532.9587   29.89537    17.83   0.000     473.7827    592.1348
   _Ifirm_23 |   84.79381   17.67614     4.80   0.000     49.80497    119.7827
   _Ifirm_24 |   31.52594   17.67635     1.78   0.077     -3.46332    66.51519
   _Ifirm_25 |   88.91691   18.33779     4.85   0.000     52.61838    125.2154
   _Ifirm_26 |   259.0241    20.1992    12.82   0.000      219.041    299.0071
   _Ifirm_27 |   76.15214    17.7359     4.29   0.000     41.04502    111.2593
   _Ifirm_28 |   344.7788   19.74015    17.47   0.000     305.7044    383.8532
   _Ifirm_29 |   102.8712   18.31788     5.62   0.000     66.61206    139.1303
   _Ifirm_30 |   15.40961   17.32924     0.89   0.376    -18.89257    49.71178
   _Ifirm_31 |    44.5314   17.81627     2.50   0.014      9.26519    79.79761
       _cons |   27.31245   12.27281     2.23   0.028     3.019176    51.60572
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
environmen~l |      9.81    0.101925
   _Ifirm_12 |      6.54    0.152829
   _Ifirm_22 |      5.79    0.172796
   _Ifirm_13 |      4.24    0.235754
    _Ifirm_6 |      2.68    0.372554
   _Ifirm_26 |      2.64    0.378505
    _Ifirm_3 |      2.55    0.392878
    _Ifirm_7 |      2.55    0.392878
   _Ifirm_28 |      2.52    0.396314
    _Ifirm_2 |      2.45    0.408804
   _Ifirm_17 |      2.40    0.416434
   _Ifirm_19 |      2.21    0.451865
   _Ifirm_25 |      2.18    0.459247
   _Ifirm_29 |      2.17    0.460246
    _Ifirm_5 |      2.10    0.475603
   _Ifirm_10 |      2.10    0.476445
   _Ifirm_31 |      2.06    0.486527
   _Ifirm_27 |      2.04    0.490947
   _Ifirm_24 |      2.02    0.494260
   _Ifirm_23 |      2.02    0.494271
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
```

```
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of totalcl

         chi2(1)      =   201.29
         Prob > chi2  =   0.0000

. xtgls totalcl environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =  11429.39
Log likelihood             =  -714.786          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      totalcl |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |  -1.727201   .8968345    -1.93   0.054    -3.484964    .0305625
              |
         firm |
           2  |     385.03   17.31408    22.24   0.000     351.0951     418.965
           3  |   1.706779   17.66151     0.10   0.923    -32.90915     36.3227
           4  |   66.95403   15.65809     4.28   0.000     36.26474    97.64331
           5  |   101.5847   16.05221     6.33   0.000     70.12291    133.0464
           6  |   454.7611   18.13687    25.07   0.000     419.2135    490.3087
           7  |   163.7372   17.66151     9.27   0.000     129.1213    198.3531
           8  |  -7.091118   15.41156    -0.46   0.645    -37.29722    23.11498
           9  |   44.62774   15.63881     2.85   0.004     13.97624    75.27925
          10  |   81.14604   16.03802     5.06   0.000      49.7121      112.58
          11  |   45.15008   15.46904     2.92   0.004     14.83133    75.46884
          12  |   981.2507   28.31743    34.65   0.000     925.7496    1036.752
          13  |   485.1539   22.79959    21.28   0.000     440.4675    529.8402
          14  |   70.64961   15.74042     4.49   0.000     39.79896    101.5003
          15  |   41.42619   15.43798     2.68   0.007      11.1683    71.68408
          16  |   2.329183   15.53359     0.15   0.881     -28.1161    32.77447
          17  |   307.6191   17.15472    17.93   0.000     273.9964    341.2417
          18  |   3.213066   15.40179     0.21   0.835    -26.97389    33.40003
          19  |   312.5681   16.46844    18.98   0.000     280.2906    344.8457
          20  |   7.452939   15.41634     0.48   0.629    -22.76252     37.6684
          21  |   399.2287   15.62454    25.55   0.000     368.6052    429.8522
          22  |   532.9587   26.63119    20.01   0.000     480.7625    585.1549
```

```
          23 |   84.79381   15.74614     5.39   0.000     53.93194    115.6557
          24 |   31.52594   15.74633     2.00   0.045      .663696    62.38818
          25 |   88.91691   16.33555     5.44   0.000     56.89982     120.934
          26 |   259.0241   17.99372    14.40   0.000      223.757    294.2911
          27 |   76.15214   15.79937     4.82   0.000     45.18593    107.1183
          28 |   344.7788   17.58479    19.61   0.000     310.3132    379.2444
          29 |   102.8712   16.31781     6.30   0.000     70.88885    134.8535
          30 |   15.40961   15.43712     1.00   0.318    -14.84659    45.66581
          31 |    44.5314   15.87097     2.81   0.005     13.42487    75.63793
             |
       _cons |   27.31245   10.93278     2.50   0.012     5.884591    48.74031
------------------------------------------------------------------------------

.
. xi: reg totalltd environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  185.93
       Model |  2283329.6    31  73655.7934           Prob > F      =  0.0000
    Residual | 48725.0439   123  396.138568           R-squared     =  0.9791
-------------+------------------------------           Adj R-squared =  0.9738
       Total | 2332054.64   154  15143.2119           Root MSE      =  19.903

------------------------------------------------------------------------------
    totalltd |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   -2.07503   .7330171    -2.83   0.005    -3.525992   -.6240675
    _Ifirm_2 |   233.5772   14.15146    16.51   0.000     205.5653    261.5892
    _Ifirm_3 |   20.15024   14.43543     1.40   0.165    -8.423802    48.72429
    _Ifirm_4 |   32.36836   12.79795     2.53   0.013     7.035596    57.70112
    _Ifirm_5 |     92.369   13.12008     7.04   0.000      66.3986    118.3394
    _Ifirm_6 |   377.2292   14.82396    25.45   0.000     347.8861    406.5723
    _Ifirm_7 |   52.41244   14.43543     3.63   0.000      23.8384    80.98649
    _Ifirm_8 |    .854306   12.59646     0.07   0.946    -24.07961    25.78822
    _Ifirm_9 |   13.51625    12.7822     1.06   0.292    -11.78532    38.81782
   _Ifirm_10 |   35.02517   13.10849     2.67   0.009     9.077721    60.97262
   _Ifirm_11 |   17.03716   12.64344     1.35   0.180    -7.989751    42.06407
   _Ifirm_12 |   504.1816   23.14492    21.78   0.000     458.3677    549.9956
   _Ifirm_13 |   322.6803   18.63497    17.32   0.000     285.7935    359.5671
   _Ifirm_14 |   25.05095   12.86524     1.95   0.054    -.4150089    50.51692
   _Ifirm_15 |   33.09783   12.61805     2.62   0.010      8.12116    58.07449
   _Ifirm_16 |   5.597973    12.6962     0.44   0.660    -19.53338    30.72932
   _Ifirm_17 |   117.9115   14.02121     8.41   0.000      90.1574    145.6657
   _Ifirm_18 |    5.54757   12.58848     0.44   0.660    -19.37054    30.46568
   _Ifirm_19 |   99.70053   13.46029     7.41   0.000     73.05672    126.3443
   _Ifirm_20 |  -.3822192   12.60036    -0.03   0.976    -25.32386    24.55942
   _Ifirm_21 |   292.1713   12.77053    22.88   0.000     266.8928    317.4498
   _Ifirm_22 |   341.4036   21.76669    15.68   0.000     298.3178    384.4895
   _Ifirm_23 |   75.56527   12.86993     5.87   0.000     50.09004    101.0405
   _Ifirm_24 |   31.52914   12.87008     2.45   0.016     6.053608    57.00467
   _Ifirm_25 |    98.9876   13.35167     7.41   0.000     72.55879    125.4164
   _Ifirm_26 |    168.268   14.70695    11.44   0.000     139.1565    197.3796
   _Ifirm_27 |   59.70331   12.91343     4.62   0.000     34.14197    85.26466
   _Ifirm_28 |   265.3894   14.37272    18.46   0.000     236.9395    293.8394
   _Ifirm_29 |   58.75092   13.33717     4.41   0.000     32.35082    85.15103
   _Ifirm_30 |   11.95718   12.61735     0.95   0.345    -13.01809    36.93244
   _Ifirm_31 |   36.22129   12.97195     2.79   0.006     10.54411    61.89847
       _cons |   2.400627   8.935781     0.27   0.789     -15.2872    20.08846
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
environmen~l |      9.81    0.101925
   _Ifirm_12 |      6.54    0.152829
   _Ifirm_22 |      5.79    0.172796
   _Ifirm_13 |      4.24    0.235754
    _Ifirm_6 |      2.68    0.372554
   _Ifirm_26 |      2.64    0.378505
    _Ifirm_3 |      2.55    0.392878
    _Ifirm_7 |      2.55    0.392878
   _Ifirm_28 |      2.52    0.396314
    _Ifirm_2 |      2.45    0.408804
   _Ifirm_17 |      2.40    0.416434
   _Ifirm_19 |      2.21    0.451865
   _Ifirm_25 |      2.18    0.459247
   _Ifirm_29 |      2.17    0.460246
    _Ifirm_5 |      2.10    0.475603
   _Ifirm_10 |      2.10    0.476445
   _Ifirm_31 |      2.06    0.486527
   _Ifirm_27 |      2.04    0.490947
   _Ifirm_24 |      2.02    0.494260
   _Ifirm_23 |      2.02    0.494271
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of totalltd

         chi2(1)      =   208.25
         Prob > chi2  =   0.0000

. xtgls totalltd environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   7263.54
```

```
Log likelihood             =  -665.601          Prob > chi2       =    0.0000

------------------------------------------------------------------------------
    totalltd |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   -2.07503   .6529814    -3.18   0.001     -3.35485   -.7952099
             |
        firm |
          2  |   233.5772   12.60631    18.53   0.000     208.8693    258.2852
          3  |   20.15024   12.85927     1.57   0.117    -5.053467    45.35395
          4  |   32.36836   11.40059     2.84   0.005     10.02362     54.7131
          5  |     92.369   11.68754     7.90   0.000     69.46183    115.2762
          6  |   377.2292   13.20538    28.57   0.000     351.3471    403.1112
          7  |   52.41244   12.85927     4.08   0.000     27.20873    77.61615
          8  |    .854306   11.22109     0.08   0.939    -21.13863    22.84724
          9  |   13.51625   11.38655     1.19   0.235    -8.800979    35.83348
         10  |   35.02517   11.67722     3.00   0.003     12.13825    57.91209
         11  |   17.03716   11.26294     1.51   0.130    -5.037804    39.11212
         12  |   504.1816   20.61781    24.45   0.000     463.7715    544.5918
         13  |   322.6803   16.60028    19.44   0.000     290.1443    355.2162
         14  |   25.05095   11.46053     2.19   0.029     2.588725    47.51318
         15  |   33.09783   11.24033     2.94   0.003     11.06718    55.12847
         16  |   5.597973   11.30994     0.49   0.621    -16.56911    27.76506
         17  |   117.9115   12.49028     9.44   0.000     93.43103     142.392
         18  |    5.54757   11.21398     0.49   0.621    -16.43143    27.52657
         19  |   99.70053    11.9906     8.31   0.000     76.19938    123.2017
         20  |  -.3822192   11.22457    -0.03   0.973    -22.38197    21.61753
         21  |   292.1713   11.37616    25.68   0.000     269.8744    314.4681
         22  |   341.4036   19.39006    17.61   0.000     303.3998    379.4075
         23  |   75.56527    11.4647     6.59   0.000     53.09486    98.03567
         24  |   31.52914   11.46484     2.75   0.006     9.058471    53.99981
         25  |    98.9876   11.89384     8.32   0.000     75.67609    122.2991
         26  |    168.268   13.10115    12.84   0.000     142.5903    193.9458
         27  |   59.70331   11.50346     5.19   0.000     37.15695    82.24967
         28  |   265.3894   12.80341    20.73   0.000     240.2952    290.4837
         29  |   58.75092   11.88093     4.94   0.000     35.46473    82.03711
         30  |   11.95718    11.2397     1.06   0.287    -10.07224    33.98659
         31  |   36.22129   11.55559     3.13   0.002     13.57276    58.86983
             |
       _cons |   2.400627   7.960113     0.30   0.763    -13.20091    18.00216
------------------------------------------------------------------------------

.
. xi: reg totalliabilities environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  431.35
       Model |  20228099.2    31  652519.33           Prob > F      =  0.0000
    Residual |  186066.454   123  1512.7354           R-squared     =  0.9909
-------------+------------------------------           Adj R-squared =  0.9886
       Total |  20414165.7   154  132559.517           Root MSE      =  38.894

------------------------------------------------------------------------------
totalliabil~s |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |  -4.217294   1.432426    -2.94   0.004    -7.052693   -1.381896
    _Ifirm_2 |   756.9832   27.65408    27.37   0.000     702.2436    811.7227
    _Ifirm_3 |   27.35299   28.20899     0.97   0.334    -28.48499    83.19096
    _Ifirm_4 |   123.8293   25.00912     4.95   0.000      74.3253    173.3333
```

_Ifirm_5	213.7615	25.63861	8.34	0.000	163.0114	264.5115
_Ifirm_6	920.1746	28.96823	31.76	0.000	862.8338	977.5155
_Ifirm_7	258.0514	28.20899	9.15	0.000	202.2134	313.8894
_Ifirm_8	-3.753348	24.61537	-0.15	0.879	-52.47796	44.97126
_Ifirm_9	75.04214	24.97833	3.00	0.003	25.59907	124.4852
_Ifirm_10	156.734	25.61595	6.12	0.000	106.0288	207.4392
_Ifirm_11	69.44509	24.70718	2.81	0.006	20.53875	118.3514
_Ifirm_12	1637.022	45.22865	36.19	0.000	1547.495	1726.549
_Ifirm_13	881.0567	36.41554	24.19	0.000	808.9743	953.139
_Ifirm_14	110.985	25.14062	4.41	0.000	61.22069	160.7493
_Ifirm_15	87.51341	24.65757	3.55	0.001	38.70525	136.3216
_Ifirm_16	16.61092	24.81028	0.67	0.504	-32.49951	65.72135
_Ifirm_17	504.0541	27.39955	18.40	0.000	449.8184	558.2898
_Ifirm_18	13.24418	24.59977	0.54	0.591	-35.44956	61.93792
_Ifirm_19	466.2007	26.30342	17.72	0.000	414.1347	518.2667
_Ifirm_20	7.369791	24.623	0.30	0.765	-41.36992	56.1095
_Ifirm_21	752.7281	24.95554	30.16	0.000	703.3302	802.1261
_Ifirm_22	1004.42	42.53539	23.61	0.000	920.2237	1088.616
_Ifirm_23	180.4493	25.14977	7.17	0.000	130.6669	230.2317
_Ifirm_24	72.18351	25.15007	2.87	0.005	22.4005	121.9665
_Ifirm_25	205.9543	26.09117	7.89	0.000	154.3084	257.6001
_Ifirm_26	459.3123	28.73959	15.98	0.000	402.424	516.2005
_Ifirm_27	140.9689	25.23478	5.59	0.000	91.01819	190.9196
_Ifirm_28	649.4179	28.08645	23.12	0.000	593.8225	705.0134
_Ifirm_29	187.7981	26.06283	7.21	0.000	136.2083	239.3879
_Ifirm_30	53.87796	24.65619	2.19	0.031	5.072538	102.6834
_Ifirm_31	91.29936	25.34914	3.60	0.000	41.12229	141.4764
_cons	31.2105	17.46186	1.79	0.076	-3.354172	65.77518

. vif

Variable	VIF	1/VIF
environmen~l	9.81	0.101925
_Ifirm_12	6.54	0.152829
_Ifirm_22	5.79	0.172796
_Ifirm_13	4.24	0.235754
_Ifirm_6	2.68	0.372554
_Ifirm_26	2.64	0.378505
_Ifirm_3	2.55	0.392878
_Ifirm_7	2.55	0.392878
_Ifirm_28	2.52	0.396314
_Ifirm_2	2.45	0.408804
_Ifirm_17	2.40	0.416434
_Ifirm_19	2.21	0.451865
_Ifirm_25	2.18	0.459247
_Ifirm_29	2.17	0.460246
_Ifirm_5	2.10	0.475603
_Ifirm_10	2.10	0.476445
_Ifirm_31	2.06	0.486527
_Ifirm_27	2.04	0.490947
_Ifirm_24	2.02	0.494260
_Ifirm_23	2.02	0.494271
_Ifirm_14	2.02	0.494631
_Ifirm_4	2.00	0.499846
_Ifirm_9	2.00	0.501079
_Ifirm_21	1.99	0.501995
_Ifirm_16	1.97	0.507890
_Ifirm_11	1.95	0.512138

```
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of totalliabilities

         chi2(1)      =   201.06
         Prob > chi2  =   0.0000

. xtgls totalliabilities environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =  16850.73
Log likelihood             = -769.4441          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
totalliabil~s |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
environmental |  -4.217294   1.276024    -3.31   0.001    -6.718255   -1.716334
              |
         firm |
            2 |   756.9832   24.63462    30.73   0.000     708.7002    805.2661
            3 |   27.35299   25.12895     1.09   0.276    -21.89885    76.60482
            4 |   123.8293   22.27846     5.56   0.000     80.16434    167.4943
            5 |   213.7615   22.83922     9.36   0.000     168.9974    258.5255
            6 |   920.1746   25.80529    35.66   0.000     869.5972    970.7521
            7 |   258.0514   25.12895    10.27   0.000     208.7996    307.3032
            8 |  -3.753348    21.9277    -0.17   0.864    -46.73084    39.22415
            9 |   75.04214   22.25103     3.37   0.001     31.43092    118.6534
           10 |    156.734   22.81903     6.87   0.000     112.0095    201.4585
           11 |   69.44509   22.00948     3.16   0.002      26.3073    112.5829
           12 |   1637.022   40.29029    40.63   0.000     1558.054    1715.989
           13 |   881.0567   32.43944    27.16   0.000     817.4765    944.6368
           14 |    110.985    22.3956     4.96   0.000     67.09044    154.8796
           15 |   87.51341   21.96529     3.98   0.000     44.46222    130.5646
           16 |   16.61092   22.10133     0.75   0.452    -26.70689    59.92873
           17 |   504.0541   24.40788    20.65   0.000     456.2155    551.8927
           18 |   13.24418    21.9138     0.60   0.546    -29.70608    56.19444
           19 |   466.2007   23.43144    19.90   0.000     420.2759    512.1255
           20 |   7.369791   21.93449     0.34   0.737    -35.62103    50.36061
           21 |   752.7281   22.23073    33.86   0.000     709.1567    796.2995
           22 |    1004.42   37.89109    26.51   0.000     930.1547    1078.685
           23 |   180.4493   22.40375     8.05   0.000     136.5388    224.3598
           24 |   72.18351   22.40401     3.22   0.001     28.27246    116.0946
```

```
          25 |   205.9543   23.24236     8.86   0.000     160.4001    251.5084
          26 |   459.3123   25.60161    17.94   0.000      409.134    509.4905
          27 |   140.9689   22.47948     6.27   0.000     96.90992    185.0279
          28 |   649.4179   25.01979    25.96   0.000     600.3801    698.4558
          29 |   187.7981   23.21712     8.09   0.000     142.2934    233.3028
          30 |   53.87796   21.96407     2.45   0.014     10.82918    96.92674
          31 |   91.29936   22.58135     4.04   0.000     47.04073     135.558
             |
       _cons |    31.2105   15.55526     2.01   0.045     .7227641    61.69825
------------------------------------------------------------------------------

. xi: reg ownersequity environmental i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =  225.48
       Model |  5609411.02    31  180948.743           Prob > F      =  0.0000
    Residual |  98706.9426   123  802.495468           R-squared     =  0.9827
-------------+------------------------------           Adj R-squared =  0.9783
       Total |  5708117.96   154  37065.7011           Root MSE      =  28.328

------------------------------------------------------------------------------
 ownersequity |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
environmental |   2.410195   1.043306     2.31   0.023     .3450338    4.475356
     _Ifirm_2 |   418.7761   20.14183    20.79   0.000     378.9065    458.6456
     _Ifirm_3 |  -25.49863   20.54601    -1.24   0.217    -66.16819    15.17093
     _Ifirm_4 |    33.3196   18.21538     1.83   0.070    -2.736625    69.37583
     _Ifirm_5 |   128.3562   18.67387     6.87   0.000     91.39238    165.3199
     _Ifirm_6 |   88.05128     21.099     4.17   0.000      46.2871    129.8154
     _Ifirm_7 |   103.8544   20.54601     5.05   0.000     63.18481    144.5239
     _Ifirm_8 |  -29.25775   17.92859    -1.63   0.105    -64.74629    6.230798
     _Ifirm_9 |    63.7948   18.19295     3.51   0.001     27.78297    99.80664
    _Ifirm_10 |   238.1611   18.65737    12.76   0.000       201.23    275.0922
    _Ifirm_11 |   40.25942   17.99546     2.24   0.027     4.638511    75.88032
    _Ifirm_12 |   408.1146   32.94227    12.39   0.000     342.9074    473.3218
    _Ifirm_13 |   325.9501   26.52324    12.29   0.000      273.449    378.4513
    _Ifirm_14 |   46.61461   18.31116     2.55   0.012      10.3688    82.86042
    _Ifirm_15 |   22.87399   17.95933     1.27   0.205     -12.6754    58.42339
    _Ifirm_16 |   28.71583   18.07056     1.59   0.115     -7.05373    64.48538
    _Ifirm_17 |   233.6391   19.95645    11.71   0.000     194.1365    273.1417
    _Ifirm_18 |  -7.817539   17.91723    -0.44   0.663     -43.2836    27.64852
    _Ifirm_19 |   817.9528   19.15808    42.69   0.000     780.0306    855.8751
    _Ifirm_20 |  -.1976991   17.93415    -0.01   0.991    -35.69724    35.30184
    _Ifirm_21 |    156.952   18.17635     8.63   0.000      120.973    192.9309
    _Ifirm_22 |   472.4293   30.98063    15.25   0.000      411.105    533.7535
    _Ifirm_23 |   53.35617   18.31782     2.91   0.004     17.09717    89.61517
    _Ifirm_24 |   35.36736   18.31804     1.93   0.056    -.8920663    71.62679
    _Ifirm_25 |   62.83461   19.00349     3.31   0.001     25.21838    100.4508
    _Ifirm_26 |   47.29755   20.93247     2.26   0.026     5.863011    88.73209
    _Ifirm_27 |   67.30909   18.37974     3.66   0.000     30.92751    103.6907
    _Ifirm_28 |   45.20356   20.45675     2.21   0.029     4.710673    85.69645
    _Ifirm_29 |   138.9223   18.98285     7.32   0.000     101.3469    176.4976
    _Ifirm_30 |   54.53794   17.95833     3.04   0.003     18.99053    90.08534
    _Ifirm_31 |   72.71455   18.46303     3.94   0.000     36.16811     109.261
        _cons |    43.8436   12.71833     3.45   0.001     18.66844    69.01877
------------------------------------------------------------------------------

. vif
```

```
    Variable |       VIF       1/VIF  
-------------+----------------------
environmen~l |      9.81    0.101925
   _Ifirm_12 |      6.54    0.152829
   _Ifirm_22 |      5.79    0.172796
   _Ifirm_13 |      4.24    0.235754
    _Ifirm_6 |      2.68    0.372554
   _Ifirm_26 |      2.64    0.378505
    _Ifirm_3 |      2.55    0.392878
    _Ifirm_7 |      2.55    0.392878
   _Ifirm_28 |      2.52    0.396314
    _Ifirm_2 |      2.45    0.408804
   _Ifirm_17 |      2.40    0.416434
   _Ifirm_19 |      2.21    0.451865
   _Ifirm_25 |      2.18    0.459247
   _Ifirm_29 |      2.17    0.460246
    _Ifirm_5 |      2.10    0.475603
   _Ifirm_10 |      2.10    0.476445
   _Ifirm_31 |      2.06    0.486527
   _Ifirm_27 |      2.04    0.490947
   _Ifirm_24 |      2.02    0.494260
   _Ifirm_23 |      2.02    0.494271
   _Ifirm_14 |      2.02    0.494631
    _Ifirm_4 |      2.00    0.499846
    _Ifirm_9 |      2.00    0.501079
   _Ifirm_21 |      1.99    0.501995
   _Ifirm_16 |      1.97    0.507890
   _Ifirm_11 |      1.95    0.512138
   _Ifirm_15 |      1.94    0.514201
   _Ifirm_30 |      1.94    0.514258
   _Ifirm_20 |      1.94    0.515646
    _Ifirm_8 |      1.94    0.515966
   _Ifirm_18 |      1.94    0.516620
-------------+----------------------
    Mean VIF |      2.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of ownersequity

         chi2(1)      =   394.93
         Prob > chi2  =   0.0000

. xtgls ownersequity environmental i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   8808.49
Log likelihood             = -720.3131          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
```

ownersequity	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
environmental	2.410195	.9293912	2.59	0.010	.5886215	4.231768
firm						
2	418.7761	17.94261	23.34	0.000	383.6092	453.943
3	-25.49863	18.30266	-1.39	0.164	-61.37118	10.37392
4	33.3196	16.2265	2.05	0.040	1.516241	65.12297
5	128.3562	16.63493	7.72	0.000	95.75229	160.96
6	88.05128	18.79527	4.68	0.000	51.21323	124.8893
7	103.8544	18.30266	5.67	0.000	67.98182	139.7269
8	-29.25775	15.97103	-1.83	0.067	-60.56038	2.044891
9	63.7948	16.20653	3.94	0.000	32.0306	95.55901
10	238.1611	16.62023	14.33	0.000	205.586	270.7361
11	40.25942	16.03059	2.51	0.012	8.84003	71.6788
12	408.1146	29.34541	13.91	0.000	350.5987	465.6306
13	325.9501	23.62725	13.80	0.000	279.6416	372.2587
14	46.61461	16.31182	2.86	0.004	14.64403	78.58519
15	22.87399	15.99841	1.43	0.153	-8.482313	54.2303
16	28.71583	16.09749	1.78	0.074	-2.834678	60.26633
17	233.6391	17.77747	13.14	0.000	198.7959	268.4823
18	-7.817539	15.96091	-0.49	0.624	-39.10034	23.46526
19	817.9528	17.06627	47.93	0.000	784.5035	851.4021
20	-.1976991	15.97598	-0.01	0.990	-31.51004	31.11464
21	156.952	16.19174	9.69	0.000	125.2167	188.6872
22	472.4293	27.59796	17.12	0.000	418.3383	526.5203
23	53.35617	16.31776	3.27	0.001	21.37396	85.33839
24	35.36736	16.31795	2.17	0.030	3.384767	67.34996
25	62.83461	16.92856	3.71	0.000	29.65525	96.01398
26	47.29755	18.64692	2.54	0.011	10.75025	83.84485
27	67.30909	16.37292	4.11	0.000	35.21875	99.39942
28	45.20356	18.22315	2.48	0.013	9.486847	80.92028
29	138.9223	16.91017	8.22	0.000	105.7789	172.0656
30	54.53794	15.99752	3.41	0.001	23.18338	85.8925
31	72.71455	16.44711	4.42	0.000	40.47879	104.9503
_cons	43.8436	11.32966	3.87	0.000	21.63787	66.04933

```
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Environment as
Dependent 2001-2005.log
  log type:  text
 closed on:  25 Jun 2012, 19:40:39
```

Appendix G: Environment as the Independent Variable 2001-2005

```
-----------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/env as independent 2001-2005.log
  log type:  text
 opened on:  25 Jun 2012, 17:57:58

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2005
                delta:  1 unit

. xi: reg environmental revenuetotal i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   40.23
       Model |  6583.93011    31  212.384842           Prob > F      =  0.0000
    Residual |  649.379169   123  5.27950544           R-squared     =  0.9102
-------------+------------------------------           Adj R-squared =  0.8876
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.2977

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
revenuetotal |   .0162506   .0039831     4.08   0.000     .0083662     .024135
    _Ifirm_2 |   -10.2575   4.896884    -2.09   0.038    -19.95058   -.5644158
    _Ifirm_3 |   10.45765   1.466979     7.13   0.000     7.553856    13.36144
    _Ifirm_4 |   1.515813   1.507409     1.01   0.317    -1.468012    4.499637
    _Ifirm_5 |   1.917003   1.643168     1.17   0.246    -1.335547    5.169554
    _Ifirm_6 |  -3.885474   3.854678    -1.01   0.315    -11.51557    3.744625
    _Ifirm_7 |   2.428416   2.288175     1.06   0.291    -2.100886    6.957719
    _Ifirm_8 |   .0164063   1.461896     0.01   0.991    -2.877326    2.910139
    _Ifirm_9 |    1.39047   1.507667     0.92   0.358    -1.593863    4.374804
   _Ifirm_10 |   1.058591    1.74361     0.61   0.545    -2.392778    4.509959
   _Ifirm_11 |    .739686   1.468949     0.50   0.615    -2.168009     3.64738
   _Ifirm_12 |   -3.11276   7.401546    -0.42   0.675    -17.76367    11.53815
   _Ifirm_13 |   3.004589   4.122799     0.73   0.468    -5.156238    11.16542
   _Ifirm_14 |   1.765746   1.522955     1.16   0.249    -1.248849    4.780342
   _Ifirm_15 |    .323209   1.468624     0.22   0.826    -2.583843     3.23026
   _Ifirm_16 |    2.24869   1.453206     1.55   0.124    -.6278419    5.125221
   _Ifirm_17 |  -3.961609   3.365922    -1.18   0.241    -10.62424    2.701026
   _Ifirm_18 |   .2166269    1.45618     0.15   0.882    -2.665792    3.099046
   _Ifirm_19 |  -5.719955   3.329829    -1.72   0.088    -12.31115    .8712371
   _Ifirm_20 |  -.6795791   1.453352    -0.47   0.641    -3.556399    2.197241
   _Ifirm_21 |  -7.481898   2.938019    -2.55   0.012    -13.29753    -1.66627
   _Ifirm_22 |   7.306624   4.394176     1.66   0.099    -1.391377    16.00462
   _Ifirm_23 |   .8974726   1.602736     0.56   0.577    -2.275046    4.069991
   _Ifirm_24 |   2.761655   1.469659     1.88   0.063    -.1474453    5.670756
   _Ifirm_25 |   3.686473   1.566444     2.35   0.020     .5857932    6.787153
   _Ifirm_26 |   3.944063   2.143966     1.84   0.068    -.2997876    8.187913
   _Ifirm_27 |   1.695113   1.553073     1.09   0.277      -1.3791    4.769325
   _Ifirm_28 |   2.181148   2.301695     0.95   0.345    -2.374917    6.737212
   _Ifirm_29 |   1.092297   1.888452     0.58   0.564    -2.645777    4.830371
   _Ifirm_30 |   .5040244   1.462486     0.34   0.731    -2.390877    3.398926
```

```
   _Ifirm_31 |   2.872697   1.493254     1.92   0.057    -.0831082    5.828502
       _cons |  -.2890199   1.080562    -0.27   0.790    -2.427925    1.849885
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
revenuetotal |     91.58    0.010920
   _Ifirm_12 |     50.21    0.019917
    _Ifirm_2 |     21.98    0.045501
   _Ifirm_22 |     17.70    0.056508
   _Ifirm_13 |     15.58    0.064192
    _Ifirm_6 |     13.62    0.073432
   _Ifirm_17 |     10.38    0.096307
   _Ifirm_19 |     10.16    0.098406
   _Ifirm_21 |      7.91    0.126402
   _Ifirm_28 |      4.86    0.205953
    _Ifirm_7 |      4.80    0.208394
   _Ifirm_26 |      4.21    0.237371
   _Ifirm_29 |      3.27    0.305951
   _Ifirm_10 |      2.79    0.358893
    _Ifirm_5 |      2.47    0.404110
   _Ifirm_23 |      2.35    0.424756
   _Ifirm_25 |      2.25    0.444666
   _Ifirm_27 |      2.21    0.452356
   _Ifirm_14 |      2.13    0.470424
    _Ifirm_9 |      2.08    0.480013
    _Ifirm_4 |      2.08    0.480177
   _Ifirm_31 |      2.04    0.489324
   _Ifirm_24 |      1.98    0.505162
   _Ifirm_11 |      1.98    0.505650
   _Ifirm_15 |      1.98    0.505874
    _Ifirm_3 |      1.97    0.507010
   _Ifirm_30 |      1.96    0.510129
    _Ifirm_8 |      1.96    0.510541
   _Ifirm_18 |      1.94    0.514557
   _Ifirm_20 |      1.94    0.516562
   _Ifirm_16 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      9.49

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    38.38
         Prob > chi2  =   0.0000

. xtgls environmental revenuetotal i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
```

```
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1571.52
Log likelihood             = -330.9613          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
revenuetotal |   .0162506   .0035482     4.58   0.000      .0092962     .023205
             |
        firm |
          2  |   -10.2575   4.362209    -2.35   0.019     -18.80727   -1.707724
          3  |   10.45765   1.306804     8.00   0.000      7.896361    13.01894
          4  |   1.515813    1.34282     1.13   0.259     -1.116067    4.147692
          5  |   1.917003   1.463756     1.31   0.190     -.9519059    4.785912
          6  |  -3.885474   3.433799    -1.13   0.258      -10.6156    2.844648
          7  |   2.428416   2.038337     1.19   0.234     -1.566651    6.423483
          8  |   .0164063   1.302276     0.01   0.990     -2.536008     2.56882
          9  |    1.39047   1.343049     1.04   0.301     -1.241858    4.022799
         10  |   1.058591   1.553231     0.68   0.496     -1.985685    4.102867
         11  |    .739686   1.308559     0.57   0.572     -1.825043    3.304415
         12  |   -3.11276   6.593396    -0.47   0.637     -16.03558    9.810058
         13  |   3.004589   3.672644     0.82   0.413     -4.193661    10.20284
         14  |   1.765746   1.356668     1.30   0.193     -.8932748    4.424768
         15  |    .323209    1.30827     0.25   0.805     -2.240953    2.887371
         16  |    2.24869   1.294535     1.74   0.082     -.2885523    4.785932
         17  |  -3.961609   2.998408    -1.32   0.186     -9.838381    1.915162
         18  |   .2166269   1.297185     0.17   0.867     -2.325808    2.759062
         19  |  -5.719955   2.966256    -1.93   0.054     -11.53371    .0937998
         20  |  -.6795791   1.294665    -0.52   0.600     -3.217076    1.857918
         21  |  -7.481898   2.617226    -2.86   0.004     -12.61157   -2.352229
         22  |   7.306624    3.91439     1.87   0.062     -.3654401    14.97869
         23  |   .8974726   1.427739     0.63   0.530     -1.900844    3.695789
         24  |   2.761655   1.309192     2.11   0.035      .1956858    5.327625
         25  |   3.686473   1.395409     2.64   0.008      .9515212    6.421425
         26  |   3.944063   1.909874     2.07   0.039      .2007785    7.687347
         27  |   1.695113   1.383498     1.23   0.220     -1.016493    4.406719
         28  |   2.181148   2.050381     1.06   0.287     -1.837525     6.19982
         29  |   1.092297   1.682258     0.65   0.516     -2.204868    4.389462
         30  |   .5040244   1.302802     0.39   0.699     -2.049421     3.05747
         31  |   2.872697   1.330211     2.16   0.031      .2655317    5.479862
             |
       _cons |  -.2890199   .9625787    -0.30   0.764     -2.175639      1.5976
------------------------------------------------------------------------------

.
. xi: reg environmental costofsales i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   40.77
       Model |  6591.79434    31  212.638527           Prob > F      =  0.0000
    Residual |   641.51493   123  5.21556854           R-squared     =  0.9113
-------------+------------------------------           Adj R-squared =  0.8890
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.2838

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 costofsales |    .021915   .0051149     4.28   0.000      .0117903    .0320397
```

_Ifirm_2	-8.482464	4.289132	-1.98	0.050	-16.97254	.0076087
_Ifirm_3	10.47551	1.457501	7.19	0.000	7.59048	13.36055
_Ifirm_4	1.853721	1.475735	1.26	0.211	-1.067405	4.774848
_Ifirm_5	2.432798	1.567874	1.55	0.123	-.6707127	5.536309
_Ifirm_6	-3.636752	3.640456	-1.00	0.320	-10.84281	3.569307
_Ifirm_7	2.974898	2.122681	1.40	0.164	-1.22682	7.176616
_Ifirm_8	-.0370171	1.451061	-0.03	0.980	-2.909303	2.835268
_Ifirm_9	1.676346	1.478469	1.13	0.259	-1.250192	4.602884
_Ifirm_10	1.524277	1.655413	0.92	0.359	-1.752511	4.801065
_Ifirm_11	.8550988	1.455221	0.59	0.558	-2.025422	3.735619
_Ifirm_12	-1.775464	6.75491	-0.26	0.793	-15.14639	11.59547
_Ifirm_13	3.288309	3.88607	0.85	0.399	-4.403928	10.98055
_Ifirm_14	2.147914	1.48493	1.45	0.151	-.7914128	5.087242
_Ifirm_15	.4093063	1.455803	0.28	0.779	-2.472366	3.290978
_Ifirm_16	2.348413	1.444534	1.63	0.107	-.5109536	5.20778
_Ifirm_17	-3.123326	3.057982	-1.02	0.309	-9.176413	2.929762
_Ifirm_18	.2544063	1.44766	0.18	0.861	-2.611147	3.11996
_Ifirm_19	-4.155145	2.876566	-1.44	0.151	-9.84913	1.538841
_Ifirm_20	-.6372681	1.444681	-0.44	0.660	-3.496925	2.222389
_Ifirm_21	-8.036275	2.94012	-2.73	0.007	-13.85606	-2.216488
_Ifirm_22	9.212943	3.789924	2.43	0.017	1.711022	16.71486
_Ifirm_23	1.278845	1.547225	0.83	0.410	-1.783791	4.341481
_Ifirm_24	2.962505	1.453429	2.04	0.044	.085531	5.839479
_Ifirm_25	4.270541	1.504345	2.84	0.005	1.292783	7.248299
_Ifirm_26	4.086523	2.059268	1.98	0.049	.0103284	8.162717
_Ifirm_27	1.70237	1.535154	1.11	0.270	-1.336373	4.741113
_Ifirm_28	2.057194	2.25262	0.91	0.363	-2.40173	6.516117
_Ifirm_29	1.704022	1.759971	0.97	0.335	-1.779732	5.187777
_Ifirm_30	.8966471	1.44584	0.62	0.536	-1.965305	3.758599
_Ifirm_31	2.978296	1.475707	2.02	0.046	.057224	5.899367
_cons	-.2386171	1.066329	-0.22	0.823	-2.349351	1.872117

. vif

Variable	VIF	1/VIF
costofsales	76.25	0.013115
_Ifirm_12	42.33	0.023623
_Ifirm_2	17.07	0.058591
_Ifirm_13	14.01	0.071376
_Ifirm_22	13.33	0.075043
_Ifirm_6	12.30	0.081332
_Ifirm_17	8.68	0.115266
_Ifirm_21	8.02	0.124693
_Ifirm_19	7.68	0.130264
_Ifirm_28	4.71	0.212420
_Ifirm_7	4.18	0.239223
_Ifirm_26	3.93	0.254183
_Ifirm_29	2.87	0.347986
_Ifirm_10	2.54	0.393332
_Ifirm_5	2.28	0.438480
_Ifirm_23	2.22	0.450262
_Ifirm_27	2.19	0.457371
_Ifirm_25	2.10	0.476297
_Ifirm_14	2.05	0.488833
_Ifirm_9	2.03	0.493115
_Ifirm_4	2.02	0.494943
_Ifirm_31	2.02	0.494962
_Ifirm_3	1.97	0.507404

```
   _Ifirm_15 |      1.97    0.508589
   _Ifirm_11 |      1.96    0.508996
   _Ifirm_24 |      1.96    0.510251
    _Ifirm_8 |      1.95    0.511919
   _Ifirm_18 |      1.94    0.514327
   _Ifirm_30 |      1.94    0.515622
   _Ifirm_20 |      1.94    0.516450
   _Ifirm_16 |      1.94    0.516555
-------------+----------------------
    Mean VIF |      8.14

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    35.36
         Prob > chi2  =   0.0000

. xtgls environmental costofsales i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1592.68
Log likelihood             =  -330.017          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 costofsales |    .021915   .0045565     4.81   0.000     .0129845    .0308455
             |
        firm |
          2  |  -8.482464   3.820816    -2.22   0.026    -15.97113   -.9938033
          3  |   10.47551   1.298362     8.07   0.000     7.930772    13.02026
          4  |   1.853721   1.314604     1.41   0.159     -.722855    4.430298
          5  |   2.432798   1.396683     1.74   0.082    -.3046507    5.170247
          6  |  -3.636752   3.242967    -1.12   0.262     -9.99285    2.719345
          7  |   2.974898   1.890913     1.57   0.116    -.7312232    6.681019
          8  |  -.0370171   1.292624    -0.03   0.977    -2.570514     2.49648
          9  |   1.676346    1.31704     1.27   0.203    -.9050041    4.257696
         10  |   1.524277   1.474664     1.03   0.301    -1.366011    4.414565
         11  |   .8550988    1.29633     0.66   0.509    -1.685661    3.395859
         12  |  -1.775464   6.017364    -0.30   0.768    -13.56928    10.01835
         13  |   3.288309   3.461763     0.95   0.342    -3.496621    10.07324
         14  |   2.147914   1.322795     1.62   0.104    -.4447164    4.740545
         15  |   .4093063   1.296848     0.32   0.752     -2.13247    2.951082
         16  |   2.348413    1.28681     1.82   0.068    -.1736887    4.870515
         17  |  -3.123326   2.724091    -1.15   0.252    -8.462446    2.215794
         18  |   .2544063   1.289595     0.20   0.844    -2.273153    2.781965
         19  |  -4.155145   2.562483    -1.62   0.105    -9.177519    .8672299
         20  |  -.6372681   1.286941    -0.50   0.620    -3.159626     1.88509
         21  |  -8.036275   2.619098    -3.07   0.002    -13.16961   -2.902937
```

```
          22 |   9.212943   3.376114     2.73   0.006     2.595881    15.83001
          23 |   1.278845   1.378288     0.93   0.353    -1.422551    3.980241
          24 |   2.962505   1.294734     2.29   0.022     .4248728    5.500137
          25 |   4.270541    1.34009     3.19   0.001     1.644013     6.89707
          26 |   4.086523   1.834423     2.23   0.026     .4911193    7.681927
          27 |    1.70237   1.367536     1.24   0.213    -.9779505     4.38269
          28 |   2.057194   2.006664     1.03   0.305    -1.875795    5.990183
          29 |   1.704022   1.567805     1.09   0.277     -1.36882    4.776865
          30 |   .8966471   1.287974     0.70   0.486    -1.627735    3.421029
          31 |   2.978296    1.31458     2.27   0.023     .4017672    5.554824
             |
       _cons |  -.2386171   .9499004    -0.25   0.802    -2.100388    1.623154
------------------------------------------------------------------------------

.
. xi: reg environmental netincome i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   38.56
       Model |  6558.43028    31  211.562267           Prob > F      =  0.0000
    Residual |  674.878991   123  5.48682107           R-squared     =  0.9067
-------------+------------------------------           Adj R-squared =  0.8832
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.3424

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   netincome |   .0496876   .0147365     3.37   0.001     .0205177    .0788576
    _Ifirm_2 |   8.570843   1.483318     5.78   0.000     5.634705    11.50698
    _Ifirm_3 |   9.867496   1.483005     6.65   0.000     6.931978    12.80301
    _Ifirm_4 |   2.885504    1.48354     1.95   0.054    -.0510727    5.822081
    _Ifirm_5 |   5.020818    1.48148     3.39   0.001     2.088319    7.953318
    _Ifirm_6 |   10.51939   1.482233     7.10   0.000     7.585404    13.45338
    _Ifirm_7 |   9.204265   1.487072     6.19   0.000     6.260698    12.14783
    _Ifirm_8 |   -.451501   1.482439    -0.30   0.761    -3.385899    2.482897
    _Ifirm_9 |   2.930418   1.481749     1.98   0.050    -.0026126     5.86345
   _Ifirm_10 |    4.73034   1.483456     3.19   0.002      1.79393    7.666749
   _Ifirm_11 |   1.701028   1.481682     1.15   0.253    -1.231871    4.633927
   _Ifirm_12 |   26.03242   1.487844    17.50   0.000     23.08732    28.97751
   _Ifirm_13 |   18.13743   1.492394    12.15   0.000     15.18333    21.09153
   _Ifirm_14 |   3.593843    1.48149     2.43   0.017     .6613254    6.526361
   _Ifirm_15 |   1.225701   1.481501     0.83   0.410     -1.70684    4.158241
   _Ifirm_16 |   2.312732   1.481552     1.56   0.121    -.6199102    5.245374
   _Ifirm_17 |   9.186781    1.49859     6.13   0.000     6.220413    12.15315
   _Ifirm_18 |   .0192145   1.482447     0.01   0.990    -2.915198    2.953627
   _Ifirm_19 |   3.010308   1.807727     1.67   0.098     -.567977    6.588593
   _Ifirm_20 |   -.698568   1.481589    -0.47   0.638    -3.631282    2.234146
   _Ifirm_21 |   3.037093   1.481766     2.05   0.043     .1040279    5.970158
   _Ifirm_22 |   22.51937   1.565485    14.38   0.000     19.42058    25.61815
   _Ifirm_23 |    3.62833   1.481483     2.45   0.016     .6958247    6.560836
   _Ifirm_24 |   3.708572   1.481542     2.50   0.014     .7759496    6.641194
   _Ifirm_25 |   6.052732   1.481473     4.09   0.000     3.120248    8.985217
   _Ifirm_26 |    10.0873    1.48392     6.80   0.000     7.149971    13.02463
   _Ifirm_27 |   4.023019   1.481715     2.72   0.008     1.090055    6.955983
   _Ifirm_28 |   9.561752   1.481749     6.45   0.000     6.628721    12.49478
   _Ifirm_29 |   5.504464   1.489107     3.70   0.000     2.556868    8.452061
   _Ifirm_30 |   1.204655   1.481487     0.81   0.418    -1.727859    4.137168
   _Ifirm_31 |   4.171277   1.481776     2.82   0.006     1.238192    7.104362
       _cons |   .8508268   1.049652     0.81   0.419    -1.226895    2.928548
```

```
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
   _Ifirm_19 |      2.88    0.346997
   netincome |      2.26    0.442103
   _Ifirm_22 |      2.16    0.462693
   _Ifirm_17 |      1.98    0.504923
   _Ifirm_13 |      1.96    0.509125
   _Ifirm_29 |      1.96    0.511375
   _Ifirm_12 |      1.95    0.512243
    _Ifirm_7 |      1.95    0.512775
   _Ifirm_26 |      1.94    0.514956
    _Ifirm_4 |      1.94    0.515220
   _Ifirm_10 |      1.94    0.515279
    _Ifirm_2 |      1.94    0.515374
    _Ifirm_3 |      1.94    0.515592
   _Ifirm_18 |      1.94    0.515980
    _Ifirm_8 |      1.94    0.515985
    _Ifirm_6 |      1.94    0.516129
   _Ifirm_31 |      1.94    0.516447
   _Ifirm_21 |      1.94    0.516454
    _Ifirm_9 |      1.94    0.516466
   _Ifirm_28 |      1.94    0.516466
   _Ifirm_27 |      1.94    0.516490
   _Ifirm_11 |      1.94    0.516513
   _Ifirm_20 |      1.94    0.516578
   _Ifirm_16 |      1.94    0.516603
   _Ifirm_24 |      1.94    0.516610
   _Ifirm_15 |      1.94    0.516639
   _Ifirm_14 |      1.94    0.516647
   _Ifirm_30 |      1.94    0.516649
   _Ifirm_23 |      1.94    0.516652
    _Ifirm_5 |      1.94    0.516654
   _Ifirm_25 |      1.94    0.516659
-------------+----------------------
    Mean VIF |      1.99

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    46.37
         Prob > chi2  =   0.0000

. xtgls environmental netincome i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
```

```
                                                  Wald chi2(31)      =    1506.28
Log likelihood             = -333.9464            Prob > chi2        =     0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   netincome |   .0496876   .0131274     3.79   0.000     .0239583    .0754169
             |
        firm |
          2  |   8.570843    1.32136     6.49   0.000     5.981025    11.16066
          3  |   9.867496   1.321081     7.47   0.000     7.278225    12.45677
          4  |   2.885504   1.321557     2.18   0.029     .2952992    5.475709
          5  |   5.020818   1.319722     3.80   0.000      2.43421    7.607427
          6  |   10.51939   1.320393     7.97   0.000     7.931471    13.10732
          7  |   9.204265   1.324704     6.95   0.000     6.607894    11.80064
          8  |   -.451501   1.320577    -0.34   0.732    -3.039784    2.136782
          9  |   2.930418   1.319962     2.22   0.026     .3433411    5.517496
         10  |    4.73034   1.321482     3.58   0.000     2.140282    7.320397
         11  |   1.701028   1.319902     1.29   0.197    -.8859331    4.287989
         12  |   26.03242   1.325392    19.64   0.000      23.4347    28.63014
         13  |   18.13743   1.329445    13.64   0.000     15.53177     20.7431
         14  |   3.593843   1.319731     2.72   0.006     1.007219    6.180468
         15  |   1.225701   1.319741     0.93   0.353    -1.360944    3.812345
         16  |   2.312732   1.319787     1.75   0.080    -.2740023    4.899466
         17  |   9.186781   1.334964     6.88   0.000     6.570299    11.80326
         18  |   .0192145   1.320583     0.01   0.988    -2.569082    2.607511
         19  |   3.010308   1.610347     1.87   0.062    -.1459149    6.166531
         20  |   -.698568   1.319819    -0.53   0.597    -3.285366     1.88823
         21  |   3.037093   1.319977     2.30   0.021     .4499857    5.624201
         22  |   22.51937   1.394555    16.15   0.000     19.78609    25.25264
         23  |    3.62833   1.319725     2.75   0.006     1.041717    6.214944
         24  |   3.708572   1.319778     2.81   0.005     1.121855    6.295289
         25  |   6.052732   1.319716     4.59   0.000     3.466137    8.639328
         26  |    10.0873   1.321896     7.63   0.000     7.496431    12.67817
         27  |   4.023019   1.319932     3.05   0.002     1.436001    6.610037
         28  |   9.561752   1.319962     7.24   0.000     6.974675    12.14883
         29  |   5.504464   1.326516     4.15   0.000      2.90454    8.104389
         30  |   1.204655   1.319729     0.91   0.361    -1.381966    3.791275
         31  |   4.171277   1.319986     3.16   0.002     1.584152    6.758402
             |
       _cons |   .8508268   .9350438     0.91   0.363    -.9818254    2.683479
------------------------------------------------------------------------------

.
. xi: reg environmental totalca i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   34.98
       Model |  6496.51397    31  209.564967           Prob > F      =  0.0000
    Residual |  736.795302   123  5.99020571           R-squared     =  0.8981
-------------+------------------------------           Adj R-squared =  0.8725
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.4475

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     totalca |   .0027028   .0097361     0.28   0.782    -.0165692    .0219748
    _Ifirm_2 |   7.399773   5.348429     1.38   0.169    -3.187114    17.98666
    _Ifirm_3 |   9.698351   1.562426     6.21   0.000     6.605624    12.79108
```

```
    _Ifirm_4 |   3.028488   1.608821     1.88   0.062    -.1560747     6.21305
    _Ifirm_5 |   4.768893   1.841866     2.59   0.011     1.123032    8.414754
    _Ifirm_6 |   9.670558   3.953958     2.45   0.016      1.84394    17.49718
    _Ifirm_7 |   9.171508   2.288401     4.01   0.000     4.641757    13.70126
    _Ifirm_8 |  -.5767289   1.561144    -0.37   0.712    -3.666917    2.513459
    _Ifirm_9 |   2.868203   1.652497     1.74   0.085    -.4028128    6.139219
   _Ifirm_10 |   4.597014   2.096654     2.19   0.030     .4468147    8.747213
   _Ifirm_11 |   1.557784   1.561494     1.00   0.320    -1.533097    4.648666
   _Ifirm_12 |   24.15745   8.567081     2.82   0.006     7.199435    41.11546
   _Ifirm_13 |   17.56612   4.521216     3.89   0.000     8.616655    26.51559
   _Ifirm_14 |   3.433713   1.693781     2.03   0.045      .080977    6.786448
   _Ifirm_15 |   1.122443   1.566495     0.72   0.475    -1.978338    4.223225
   _Ifirm_16 |   2.235424   1.549951     1.44   0.152    -.8326097    5.303457
   _Ifirm_17 |   7.787706   2.768774     2.81   0.006     2.307088    13.26832
   _Ifirm_18 |  -.1493037   1.548714    -0.10   0.923    -3.214889    2.916282
   _Ifirm_19 |   4.683859    6.73394     0.70   0.488    -8.645562    18.01328
   _Ifirm_20 |  -.7722127   1.548208    -0.50   0.619    -3.836795     2.29237
   _Ifirm_21 |   2.280729   2.822097     0.81   0.421    -3.305439    7.866896
   _Ifirm_22 |    22.6585   5.852676     3.87   0.000     11.07349    34.24352
   _Ifirm_23 |    3.46103   1.698912     2.04   0.044      .098138    6.823922
   _Ifirm_24 |    3.58979   1.566414     2.29   0.024     .4891696    6.690411
   _Ifirm_25 |   5.854252    1.73564     3.37   0.001     2.418659    9.289846
   _Ifirm_26 |   9.876074   2.372488     4.16   0.000      5.17988    14.57227
   _Ifirm_27 |   3.694194   1.766712     2.09   0.039     .1970955    7.191292
   _Ifirm_28 |   8.835308   2.741353     3.22   0.002     3.408967    14.26165
   _Ifirm_29 |   5.627263   2.079131     2.71   0.008     1.511749    9.742776
   _Ifirm_30 |    1.05078   1.611506     0.65   0.516    -2.139098    4.240658
   _Ifirm_31 |   4.136353   1.625621     2.54   0.012     .9185358    7.354171
       _cons |   .9387199   1.199007     0.78   0.435    -1.434641    3.312081
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
     totalca |    120.08    0.008328
   _Ifirm_12 |     59.29    0.016867
   _Ifirm_19 |     36.63    0.027301
   _Ifirm_22 |     27.67    0.036141
    _Ifirm_2 |     23.11    0.043277
   _Ifirm_13 |     16.51    0.060562
    _Ifirm_6 |     12.63    0.079186
   _Ifirm_21 |      6.43    0.155442
   _Ifirm_17 |      6.19    0.161487
   _Ifirm_28 |      6.07    0.164734
   _Ifirm_26 |      4.55    0.219940
    _Ifirm_7 |      4.23    0.236400
   _Ifirm_10 |      3.55    0.281617
   _Ifirm_29 |      3.49    0.286384
    _Ifirm_5 |      2.74    0.364919
   _Ifirm_27 |      2.52    0.396626
   _Ifirm_25 |      2.43    0.410954
   _Ifirm_23 |      2.33    0.428914
   _Ifirm_14 |      2.32    0.431517
    _Ifirm_9 |      2.21    0.453347
   _Ifirm_31 |      2.13    0.468461
   _Ifirm_30 |      2.10    0.476703
    _Ifirm_4 |      2.09    0.478296
   _Ifirm_15 |      1.98    0.504492
   _Ifirm_24 |      1.98    0.504544
```

```
    _Ifirm_3 |      1.97    0.507123
   _Ifirm_11 |      1.97    0.507728
    _Ifirm_8 |      1.97    0.507956
   _Ifirm_16 |      1.94    0.515319
   _Ifirm_18 |      1.94    0.516142
   _Ifirm_20 |      1.94    0.516480
-------------+----------------------
    Mean VIF |     11.84

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    48.30
         Prob > chi2  =   0.0000

. xtgls environmental totalca i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1366.67
Log likelihood             = -340.7491          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     totalca |   .0027028    .008673     0.31   0.755     -.014296    .0197017
             |
        firm |
          2  |   7.399773   4.764452     1.55   0.120    -1.938381    16.73793
          3  |   9.698351    1.39183     6.97   0.000     6.970414    12.42629
          4  |   3.028488   1.433159     2.11   0.035     .2195474    5.837428
          5  |   4.768893   1.640759     2.91   0.004     1.553065    7.984721
          6  |   9.670558   3.522239     2.75   0.006     2.767096    16.57402
          7  |   9.171508   2.038538     4.50   0.000     5.176046    13.16697
          8  |  -.5767289   1.390688    -0.41   0.678    -3.302426    2.148969
          9  |   2.868203   1.472066     1.95   0.051    -.0169934      5.7534
         10  |   4.597014   1.867728     2.46   0.014     .9363346    8.257693
         11  |   1.557784      1.391     1.12   0.263    -1.168525    4.284094
         12  |   24.15745    7.63167     3.17   0.002     9.199649    39.11524
         13  |   17.56612   4.027559     4.36   0.000     9.672253    25.45999
         14  |   3.433713   1.508843     2.28   0.023     .4764353     6.39099
         15  |   1.122443   1.395455     0.80   0.421    -1.612598    3.857485
         16  |   2.235424   1.380717     1.62   0.105    -.4707322     4.94158
         17  |   7.787706   2.466461     3.16   0.002     2.953532    12.62188
         18  |  -.1493037   1.379615    -0.11   0.914      -2.8533    2.554693
         19  |   4.683859   5.998683     0.78   0.435    -7.073345    16.44106
         20  |  -.7722127   1.379164    -0.56   0.576    -3.475325    1.930899
         21  |   2.280729   2.513961     0.91   0.364    -2.646545    7.208002
         22  |    22.6585   5.213642     4.35   0.000     12.43995    32.87705
         23  |    3.46103   1.513413     2.29   0.022     .4947943    6.427266
```

```
          24 |    3.58979   1.395383     2.57   0.010     .8548907     6.32469
          25 |   5.854252   1.546131     3.79   0.000     2.823891    8.884614
          26 |   9.876074   2.113444     4.67   0.000       5.7338    14.01835
          27 |   3.694194   1.573811     2.35   0.019     .6095815    6.778806
          28 |   8.835308   2.442034     3.62   0.000     4.049009    13.62161
          29 |   5.627263   1.852118     3.04   0.002     1.997178    9.257347
          30 |    1.05078   1.435551     0.73   0.464    -1.762849    3.864408
          31 |   4.136353   1.448125     2.86   0.004      1.29808    6.974626
             |
       _cons |   .9387199   1.068092     0.88   0.379    -1.154701    3.032141
------------------------------------------------------------------------------

.
. xi: reg environmental totalassets i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   35.38
       Model |  6503.89317    31  209.803006           Prob > F      =  0.0000
    Residual |  729.416101   123   5.9302122           R-squared     =  0.8992
-------------+------------------------------           Adj R-squared =  0.8737
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.4352

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 totalassets |  -.0058852   .0051182    -1.15   0.252    -.0160163    .0042459
    _Ifirm_2 |   15.64678   6.132709     2.55   0.012     3.507458     27.7861
    _Ifirm_3 |   9.547797   1.542216     6.19   0.000     6.495074    12.60052
    _Ifirm_4 |   4.041552   1.724236     2.34   0.021     .6285325    7.454571
    _Ifirm_5 |   7.005769   2.297149     3.05   0.003     2.458705    11.55283
    _Ifirm_6 |   16.50063   5.290637     3.12   0.002      6.02814    26.97312
    _Ifirm_7 |   11.66678   2.341103     4.98   0.000     7.032706    16.30084
    _Ifirm_8 |  -.8205452    1.54877    -0.53   0.597     -3.88624    2.245149
    _Ifirm_9 |   3.813673   1.684636     2.26   0.025     .4790388    7.148307
   _Ifirm_10 |   7.260576   2.504534     2.90   0.004     2.303003    12.21815
   _Ifirm_11 |   2.243261    1.63426     1.37   0.172     -.991656    5.478177
   _Ifirm_12 |   38.25086   10.33768     3.70   0.000     17.78805    58.71368
   _Ifirm_13 |   25.64953   6.198688     4.14   0.000     13.37961    37.91945
   _Ifirm_14 |   4.513559   1.723301     2.62   0.010      1.10239    7.924728
   _Ifirm_15 |   1.826206    1.63676     1.12   0.267     -1.41366    5.066072
   _Ifirm_16 |    2.50015   1.554559     1.61   0.110    -.5770042    5.577303
   _Ifirm_17 |   12.67688   4.005652     3.16   0.002     4.747936    20.60582
   _Ifirm_18 |  -.1293296   1.540436    -0.08   0.933    -3.178528    2.919869
   _Ifirm_19 |   13.99155   6.692025     2.09   0.039     .7450976    27.23801
   _Ifirm_20 |  -.7137114   1.540779    -0.46   0.644     -3.76359    2.336167
   _Ifirm_21 |   8.258236   4.878263     1.69   0.093    -1.397986    17.91446
   _Ifirm_22 |   32.65933   7.494678     4.36   0.000     17.82407    47.49458
   _Ifirm_23 |   4.992519   1.929846     2.59   0.011     1.172507     8.81253
   _Ifirm_24 |   4.250473   1.624503     2.62   0.010      1.03487    7.466076
   _Ifirm_25 |     7.5895   2.028125     3.74   0.000     3.574951    11.60405
   _Ifirm_26 |   13.24636   2.933751     4.52   0.000     7.439184    19.05354
   _Ifirm_27 |   5.114557   1.852637     2.76   0.007     1.447376    8.781739
   _Ifirm_28 |   13.45075   3.794315     3.54   0.001     5.940135    20.96136
   _Ifirm_29 |   7.871473   2.232821     3.53   0.001     3.451741    12.29121
   _Ifirm_30 |   1.800752   1.633415     1.10   0.272    -1.432494    5.033997
   _Ifirm_31 |      5.194   1.735499     2.99   0.003     1.758685    8.629314
       _cons |   1.504881   1.151551     1.31   0.194    -.7745434    3.784305
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
 totalassets |    176.23    0.005674
   _Ifirm_12 |     87.20    0.011468
   _Ifirm_22 |     45.83    0.021819
   _Ifirm_19 |     36.54    0.027367
   _Ifirm_13 |     31.35    0.031896
    _Ifirm_2 |     30.69    0.032586
    _Ifirm_6 |     22.84    0.043785
   _Ifirm_21 |     19.42    0.051500
   _Ifirm_17 |     13.09    0.076383
   _Ifirm_28 |     11.75    0.085128
   _Ifirm_26 |      7.02    0.142395
   _Ifirm_10 |      5.12    0.195383
    _Ifirm_7 |      4.47    0.223614
    _Ifirm_5 |      4.31    0.232254
   _Ifirm_29 |      4.07    0.245829
   _Ifirm_25 |      3.36    0.297955
   _Ifirm_23 |      3.04    0.329075
   _Ifirm_27 |      2.80    0.357075
   _Ifirm_31 |      2.46    0.406904
    _Ifirm_4 |      2.43    0.412237
   _Ifirm_14 |      2.42    0.412685
    _Ifirm_9 |      2.32    0.431846
   _Ifirm_15 |      2.19    0.457479
   _Ifirm_11 |      2.18    0.458879
   _Ifirm_30 |      2.18    0.459354
   _Ifirm_24 |      2.15    0.464408
   _Ifirm_16 |      1.97    0.507138
    _Ifirm_8 |      1.96    0.510937
    _Ifirm_3 |      1.94    0.515288
   _Ifirm_20 |      1.94    0.516250
   _Ifirm_18 |      1.94    0.516480
-------------+----------------------
    Mean VIF |     17.33

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    46.61
         Prob > chi2  =   0.0000

. xtgls environmental totalassets i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1382.07
Log likelihood             =  -339.969          Prob > chi2        =    0.0000
```

```
------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 totalassets |  -.0058852   .0045593    -1.29   0.197    -.0148214    .0030509
             |
        firm |
          2  |   15.64678   5.463099     2.86   0.004     4.939302    26.35425
          3  |   9.547797   1.373827     6.95   0.000     6.855145    12.24045
          4  |   4.041552   1.535972     2.63   0.009     1.031101    7.052002
          5  |   7.005769   2.046331     3.42   0.001     2.995035     11.0165
          6  |   16.50063    4.71297     3.50   0.000     7.263381    25.73788
          7  |   11.66678   2.085485     5.59   0.000     7.579299    15.75425
          8  |  -.8205452   1.379665    -0.59   0.552    -3.524638    1.883548
          9  |   3.813673   1.500696     2.54   0.011      .872362    6.754984
         10  |   7.260576   2.231073     3.25   0.001     2.887754     11.6334
         11  |   2.243261    1.45582     1.54   0.123    -.6100946    5.096616
         12  |   38.25086   9.208947     4.15   0.000     20.20166    56.30007
         13  |   25.64953   5.521874     4.65   0.000     14.82686     36.4722
         14  |   4.513559    1.53514     2.94   0.003      1.50474    7.522377
         15  |   1.826206   1.458048     1.25   0.210    -1.031515    4.683926
         16  |    2.50015   1.384822     1.81   0.071     -.214051     5.21435
         17  |   12.67688   3.568288     3.55   0.000     5.683162     19.6706
         18  |  -.1293296   1.372241    -0.09   0.925    -2.818872    2.560213
         19  |   13.99155   5.961345     2.35   0.019     2.307529    25.67557
         20  |  -.7137114   1.372547    -0.52   0.603    -3.403854    1.976431
         21  |   8.258236   4.345622     1.90   0.057    -.2590257     16.7755
         22  |   32.65933   6.676359     4.89   0.000     19.57391    45.74475
         23  |   4.992519   1.719132     2.90   0.004     1.623081    8.361956
         24  |   4.250473   1.447129     2.94   0.003     1.414153    7.086793
         25  |     7.5895   1.806681     4.20   0.000     4.048471    11.13053
         26  |   13.24636   2.613424     5.07   0.000     8.124146    18.36858
         27  |   5.114557   1.650354     3.10   0.002     1.879923    8.349191
         28  |   13.45075   3.380027     3.98   0.000     6.826019    20.07548
         29  |   7.871473   1.989027     3.96   0.000     3.973052    11.76989
         30  |   1.800752   1.455068     1.24   0.216    -1.051129    4.652633
         31  |      5.194   1.546006     3.36   0.001     2.163884    8.224115
             |
       _cons |   1.504881   1.025817     1.47   0.142    -.5056832    3.515445
------------------------------------------------------------------------------

.
. xi: reg environmental totalca i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   34.98
       Model |  6496.51397    31  209.564967           Prob > F      =  0.0000
    Residual |  736.795302   123  5.99020571           R-squared     =  0.8981
-------------+------------------------------           Adj R-squared =  0.8725
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.4475

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     totalca |   .0027028   .0097361     0.28   0.782    -.0165692    .0219748
    _Ifirm_2 |   7.399773   5.348429     1.38   0.169    -3.187114    17.98666
    _Ifirm_3 |   9.698351   1.562426     6.21   0.000     6.605624    12.79108
    _Ifirm_4 |   3.028488   1.608821     1.88   0.062    -.1560747     6.21305
    _Ifirm_5 |   4.768893   1.841866     2.59   0.011     1.123032    8.414754
```

_Ifirm_6	9.670558	3.953958	2.45	0.016	1.84394	17.49718
_Ifirm_7	9.171508	2.288401	4.01	0.000	4.641757	13.70126
_Ifirm_8	-.5767289	1.561144	-0.37	0.712	-3.666917	2.513459
_Ifirm_9	2.868203	1.652497	1.74	0.085	-.4028128	6.139219
_Ifirm_10	4.597014	2.096654	2.19	0.030	.4468147	8.747213
_Ifirm_11	1.557784	1.561494	1.00	0.320	-1.533097	4.648666
_Ifirm_12	24.15745	8.567081	2.82	0.006	7.199435	41.11546
_Ifirm_13	17.56612	4.521216	3.89	0.000	8.616655	26.51559
_Ifirm_14	3.433713	1.693781	2.03	0.045	.080977	6.786448
_Ifirm_15	1.122443	1.566495	0.72	0.475	-1.978338	4.223225
_Ifirm_16	2.235424	1.549951	1.44	0.152	-.8326097	5.303457
_Ifirm_17	7.787706	2.768774	2.81	0.006	2.307088	13.26832
_Ifirm_18	-.1493037	1.548714	-0.10	0.923	-3.214889	2.916282
_Ifirm_19	4.683859	6.73394	0.70	0.488	-8.645562	18.01328
_Ifirm_20	-.7722127	1.548208	-0.50	0.619	-3.836795	2.29237
_Ifirm_21	2.280729	2.822097	0.81	0.421	-3.305439	7.866896
_Ifirm_22	22.6585	5.852676	3.87	0.000	11.07349	34.24352
_Ifirm_23	3.46103	1.698912	2.04	0.044	.098138	6.823922
_Ifirm_24	3.58979	1.566414	2.29	0.024	.4891696	6.690411
_Ifirm_25	5.854252	1.73564	3.37	0.001	2.418659	9.289846
_Ifirm_26	9.876074	2.372488	4.16	0.000	5.17988	14.57227
_Ifirm_27	3.694194	1.766712	2.09	0.039	.1970955	7.191292
_Ifirm_28	8.835308	2.741353	3.22	0.002	3.408967	14.26165
_Ifirm_29	5.627263	2.079131	2.71	0.008	1.511749	9.742776
_Ifirm_30	1.05078	1.611506	0.65	0.516	-2.139098	4.240658
_Ifirm_31	4.136353	1.625621	2.54	0.012	.9185358	7.354171
_cons	.9387199	1.199007	0.78	0.435	-1.434641	3.312081

. vif

Variable	VIF	1/VIF
totalca	120.08	0.008328
_Ifirm_12	59.29	0.016867
_Ifirm_19	36.63	0.027301
_Ifirm_22	27.67	0.036141
_Ifirm_2	23.11	0.043277
_Ifirm_13	16.51	0.060562
_Ifirm_6	12.63	0.079186
_Ifirm_21	6.43	0.155442
_Ifirm_17	6.19	0.161487
_Ifirm_28	6.07	0.164734
_Ifirm_26	4.55	0.219940
_Ifirm_7	4.23	0.236400
_Ifirm_10	3.55	0.281617
_Ifirm_29	3.49	0.286384
_Ifirm_5	2.74	0.364919
_Ifirm_27	2.52	0.396626
_Ifirm_25	2.43	0.410954
_Ifirm_23	2.33	0.428914
_Ifirm_14	2.32	0.431517
_Ifirm_9	2.21	0.453347
_Ifirm_31	2.13	0.468461
_Ifirm_30	2.10	0.476703
_Ifirm_4	2.09	0.478296
_Ifirm_15	1.98	0.504492
_Ifirm_24	1.98	0.504544
_Ifirm_3	1.97	0.507123
_Ifirm_11	1.97	0.507728

```
    _Ifirm_8 |      1.97    0.507956
   _Ifirm_16 |      1.94    0.515319
   _Ifirm_18 |      1.94    0.516142
   _Ifirm_20 |      1.94    0.516480
-------------+----------------------
    Mean VIF |     11.84

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    48.30
         Prob > chi2  =   0.0000

. xtgls environmental totalca i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1366.67
Log likelihood             = -340.7491          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     totalca |   .0027028    .008673     0.31   0.755     -.014296    .0197017
             |
        firm |
          2  |   7.399773   4.764452     1.55   0.120    -1.938381    16.73793
          3  |   9.698351    1.39183     6.97   0.000     6.970414    12.42629
          4  |   3.028488   1.433159     2.11   0.035     .2195474    5.837428
          5  |   4.768893   1.640759     2.91   0.004     1.553065    7.984721
          6  |   9.670558   3.522239     2.75   0.006     2.767096    16.57402
          7  |   9.171508   2.038538     4.50   0.000     5.176046    13.16697
          8  |  -.5767289   1.390688    -0.41   0.678    -3.302426    2.148969
          9  |   2.868203   1.472066     1.95   0.051    -.0169934      5.7534
         10  |   4.597014   1.867728     2.46   0.014     .9363346    8.257693
         11  |   1.557784      1.391     1.12   0.263    -1.168525    4.284094
         12  |   24.15745    7.63167     3.17   0.002     9.199649    39.11524
         13  |   17.56612   4.027559     4.36   0.000     9.672253    25.45999
         14  |   3.433713   1.508843     2.28   0.023     .4764353     6.39099
         15  |   1.122443   1.395455     0.80   0.421    -1.612598    3.857485
         16  |   2.235424   1.380717     1.62   0.105    -.4707322     4.94158
         17  |   7.787706   2.466461     3.16   0.002     2.953532    12.62188
         18  |  -.1493037   1.379615    -0.11   0.914      -2.8533    2.554693
         19  |   4.683859   5.998683     0.78   0.435    -7.073345    16.44106
         20  |  -.7722127   1.379164    -0.56   0.576    -3.475325    1.930899
         21  |   2.280729   2.513961     0.91   0.364    -2.646545    7.208002
         22  |    22.6585   5.213642     4.35   0.000     12.43995    32.87705
         23  |    3.46103   1.513413     2.29   0.022     .4947943    6.427266
         24  |    3.58979   1.395383     2.57   0.010     .8548907     6.32469
         25  |   5.854252   1.546131     3.79   0.000     2.823891    8.884614
```

```
          26 |   9.876074   2.113444     4.67   0.000       5.7338    14.01835
          27 |   3.694194   1.573811     2.35   0.019     .6095815    6.778806
          28 |   8.835308   2.442034     3.62   0.000     4.049009    13.62161
          29 |   5.627263   1.852118     3.04   0.002     1.997178    9.257347
          30 |    1.05078   1.435551     0.73   0.464    -1.762849    3.864408
          31 |   4.136353   1.448125     2.86   0.004      1.29808    6.974626
             |
       _cons |   .9387199   1.068092     0.88   0.379    -1.154701    3.032141
------------------------------------------------------------------------------

.
. xi: reg environmental totalcl i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   35.89
       Model |  6513.28205    31  210.105873           Prob > F      =  0.0000
    Residual |  720.027226   123  5.85387988           R-squared     =  0.9005
-------------+------------------------------           Adj R-squared =  0.8754
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.4195

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     totalcl |  -.0135306   .0078868    -1.72   0.089     -.029142    .0020808
    _Ifirm_2 |   13.82453   3.293544     4.20   0.000     7.305166     20.3439
    _Ifirm_3 |   9.437221   1.534744     6.15   0.000     6.399288    12.47515
    _Ifirm_4 |   3.982507   1.605276     2.48   0.014      .804961    7.160053
    _Ifirm_5 |   6.302575   1.696472     3.72   0.000     2.944512    9.660637
    _Ifirm_6 |   16.58418   3.766001     4.40   0.000      9.12961    24.03875
    _Ifirm_7 |   11.62959   1.920226     6.06   0.000     7.828617    15.43056
    _Ifirm_8 |  -.7141538   1.530944    -0.47   0.642    -3.744564    2.316256
    _Ifirm_9 |   3.561856   1.561439     2.28   0.024     .4710828     6.65263
   _Ifirm_10 |   5.970946   1.633631     3.66   0.000     2.737274    9.204618
   _Ifirm_11 |   2.187969    1.56626     1.40   0.165    -.9123457    5.288284
   _Ifirm_12 |   39.15427   7.534979     5.20   0.000     24.23924     54.0693
   _Ifirm_13 |   24.87173   3.884999     6.40   0.000     17.18162    32.56185
   _Ifirm_14 |   4.495824   1.612277     2.79   0.006     1.304421    7.687226
   _Ifirm_15 |   1.721929   1.561401     1.10   0.272    -1.368769    4.812627
   _Ifirm_16 |    2.23616   1.530263     1.46   0.146    -.7929024    5.265222
   _Ifirm_17 |   12.39037   2.771988     4.47   0.000     6.903393    17.87735
   _Ifirm_18 |   -.115716   1.530461    -0.08   0.940     -3.14517    2.913738
   _Ifirm_19 |   10.58045   2.826592     3.74   0.000     4.985384    16.17552
   _Ifirm_20 |   -.645348   1.531776    -0.42   0.674    -3.677405    2.386709
   _Ifirm_21 |   8.268988   3.464847     2.39   0.019     1.410537    15.12744
   _Ifirm_22 |    30.8705   4.164637     7.41   0.000     22.62685    39.11414
   _Ifirm_23 |   4.717283   1.650654     2.86   0.005     1.449915    7.984651
   _Ifirm_24 |   3.997514   1.543077     2.59   0.011     .9430886     7.05194
   _Ifirm_25 |    7.13339   1.650502     4.32   0.000     3.866322    10.40046
   _Ifirm_26 |   13.63748   2.440774     5.59   0.000     8.806115    18.46884
   _Ifirm_27 |   4.869125   1.625059     3.00   0.003     1.652419     8.08583
   _Ifirm_28 |    13.9073   3.008506     4.62   0.000     7.952145    19.86245
   _Ifirm_29 |   7.263992    1.69517     4.29   0.000     3.908507    10.61948
   _Ifirm_30 |   1.356236   1.533847     0.88   0.378     -1.67992    4.392393
   _Ifirm_31 |   4.776848   1.558009     3.07   0.003     1.692864    7.860831
       _cons |    1.41904   1.100493     1.29   0.200    -.7593178    3.597398
------------------------------------------------------------------------------

. vif
```

```
    Variable |       VIF       1/VIF
-------------+----------------------
     totalcl |     72.99    0.013700
   _Ifirm_12 |     46.93    0.021308
   _Ifirm_22 |     14.34    0.069753
   _Ifirm_13 |     12.48    0.080155
    _Ifirm_6 |     11.72    0.085301
   _Ifirm_21 |      9.92    0.100773
    _Ifirm_2 |      8.97    0.111529
   _Ifirm_28 |      7.48    0.133663
   _Ifirm_19 |      6.60    0.151422
   _Ifirm_17 |      6.35    0.157446
   _Ifirm_26 |      4.92    0.203076
    _Ifirm_7 |      3.05    0.328103
    _Ifirm_5 |      2.38    0.420359
   _Ifirm_29 |      2.38    0.421005
   _Ifirm_23 |      2.25    0.444020
   _Ifirm_25 |      2.25    0.444101
   _Ifirm_10 |      2.21    0.453322
   _Ifirm_27 |      2.18    0.458116
   _Ifirm_14 |      2.15    0.465409
    _Ifirm_4 |      2.13    0.469477
   _Ifirm_11 |      2.03    0.493159
    _Ifirm_9 |      2.02    0.496208
   _Ifirm_15 |      2.02    0.496232
   _Ifirm_31 |      2.01    0.498396
   _Ifirm_24 |      1.97    0.508088
    _Ifirm_3 |      1.95    0.513620
   _Ifirm_30 |      1.94    0.514221
   _Ifirm_20 |      1.94    0.515613
    _Ifirm_8 |      1.94    0.516173
   _Ifirm_18 |      1.94    0.516499
   _Ifirm_16 |      1.94    0.516633
-------------+----------------------
    Mean VIF |      7.91

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    46.22
         Prob > chi2  =   0.0000

. xtgls environmental totalcl i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1402.11
Log likelihood             = -338.9649          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
```

```
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    totalcl  |  -.0135306   .0070256    -1.93   0.054    -.0273006    .0002394
             |
       firm  |
          2  |   13.82453   2.933933     4.71   0.000     8.074131    19.57494
          3  |   9.437221   1.367171     6.90   0.000     6.757615    12.11683
          4  |   3.982507   1.430001     2.78   0.005     1.179755    6.785258
          5  |   6.302575    1.51124     4.17   0.000     3.340599    9.264551
          6  |   16.58418   3.354804     4.94   0.000     10.00888    23.15947
          7  |   11.62959   1.710563     6.80   0.000     8.276945    14.98223
          8  |  -.7141538   1.363785    -0.52   0.601    -3.387124    1.958816
          9  |   3.561856   1.390951     2.56   0.010     .8356424     6.28807
         10  |   5.970946    1.45526     4.10   0.000     3.118689    8.823204
         11  |   2.187969   1.395245     1.57   0.117    -.5466607    4.922599
         12  |   39.15427    6.71226     5.83   0.000     25.99848    52.31006
         13  |   24.87173   3.460809     7.19   0.000     18.08867     31.6548
         14  |   4.495824   1.436238     3.13   0.002      1.68085    7.310797
         15  |   1.721929   1.390917     1.24   0.216    -1.004219    4.448077
         16  |    2.23616   1.363179     1.64   0.101    -.4356217    4.907941
         17  |   12.39037   2.469324     5.02   0.000     7.550587    17.23016
         18  |   -.115716   1.363355    -0.08   0.932    -2.787843    2.556411
         19  |   10.58045   2.517966     4.20   0.000     5.645327    15.51557
         20  |   -.645348   1.364527    -0.47   0.636    -3.319771    2.029075
         21  |   8.268988   3.086531     2.68   0.007     2.219498    14.31848
         22  |    30.8705   3.709914     8.32   0.000      23.5992    38.14179
         23  |   4.717283   1.470424     3.21   0.001     1.835304    7.599262
         24  |   3.997514   1.374593     2.91   0.004     1.303361    6.691667
         25  |    7.13339    1.47029     4.85   0.000     4.251676     10.0151
         26  |   13.63748   2.174274     6.27   0.000     9.375979    17.89898
         27  |   4.869125   1.447624     3.36   0.001     2.031833    7.706416
         28  |    13.9073   2.680017     5.19   0.000     8.654561    19.16004
         29  |   7.263992    1.51008     4.81   0.000     4.304289     10.2237
         30  |   1.356236   1.366372     0.99   0.321    -1.321802    4.034275
         31  |   4.776848   1.387895     3.44   0.001     2.056623    7.497073
             |
      _cons  |    1.41904   .9803335     1.45   0.148    -.5023784    3.340458
------------------------------------------------------------------------------

.
. xi: reg environmental totalltd i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   37.50
       Model |  6541.14681    31  211.004736           Prob > F      =  0.0000
    Residual |  692.162463   123   5.6273371           R-squared     =  0.9043
-------------+------------------------------           Adj R-squared =  0.8802
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.3722

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    totalltd |  -.0294768   .0104129    -2.83   0.005    -.0500884   -.0088652
    _Ifirm_2 |   15.16657   2.697361     5.62   0.000     9.827308    20.50583
    _Ifirm_3 |   9.643768   1.500312     6.43   0.000     6.673992    12.61354
    _Ifirm_4 |   3.911633   1.524233     2.57   0.011     .8945074    6.928758
    _Ifirm_5 |   7.460102   1.725745     4.32   0.000     4.044095    10.87611
    _Ifirm_6 |   21.14682   3.990069     5.30   0.000     13.24873    29.04492
    _Ifirm_7 |   10.59475   1.537801     6.89   0.000     7.550772    13.63874
```

_Ifirm_8	-.5691002	1.500481	-0.38	0.705	-3.539211	2.401011
_Ifirm_9	3.241958	1.5022	2.16	0.033	.2684456	6.215471
_Ifirm_10	5.716839	1.522148	3.76	0.000	2.703842	8.729837
_Ifirm_11	2.018231	1.507065	1.34	0.183	-.9649118	5.001374
_Ifirm_12	39.73759	4.912185	8.09	0.000	30.01422	49.46096
_Ifirm_13	27.11041	3.314048	8.18	0.000	20.55046	33.67037
_Ifirm_14	4.141322	1.511375	2.74	0.007	1.149648	7.132996
_Ifirm_15	2.09208	1.533839	1.36	0.175	-.9440607	5.128221
_Ifirm_16	2.284336	1.500342	1.52	0.130	-.6854987	5.25417
_Ifirm_17	11.38534	1.828809	6.23	0.000	7.765321	15.00535
_Ifirm_18	.0104945	1.501563	0.01	0.994	-2.961757	2.982746
_Ifirm_19	9.044282	1.748347	5.17	0.000	5.583537	12.50503
_Ifirm_20	-.7285799	1.500364	-0.49	0.628	-3.698458	2.241298
_Ifirm_21	11.3685	3.335387	3.41	0.001	4.766309	17.9707
_Ifirm_22	32.80713	3.382488	9.70	0.000	26.1117	39.50256
_Ifirm_23	5.659238	1.658919	3.41	0.001	2.37551	8.942966
_Ifirm_24	4.362133	1.520884	2.87	0.005	1.351637	7.37263
_Ifirm_25	8.618629	1.749317	4.93	0.000	5.155963	12.0813
_Ifirm_26	14.7006	2.141411	6.86	0.000	10.46181	18.93939
_Ifirm_27	5.450046	1.593436	3.42	0.001	2.295936	8.604155
_Ifirm_28	16.7074	2.96637	5.63	0.000	10.83565	22.57914
_Ifirm_29	7.376627	1.57579	4.68	0.000	4.257446	10.49581
_Ifirm_30	1.455778	1.503582	0.97	0.335	-1.520471	4.432026
_Ifirm_31	5.080455	1.527106	3.33	0.001	2.057641	8.103269
_cons	1.079635	1.060882	1.02	0.311	-1.020316	3.179585

. vif

Variable	VIF	1/VIF
totalltd	44.93	0.022255
_Ifirm_12	20.75	0.048197
_Ifirm_6	13.69	0.073049
_Ifirm_22	9.84	0.101648
_Ifirm_21	9.57	0.104540
_Ifirm_13	9.44	0.105890
_Ifirm_28	7.57	0.132167
_Ifirm_2	6.26	0.159844
_Ifirm_26	3.94	0.253614
_Ifirm_17	2.88	0.347726
_Ifirm_25	2.63	0.380046
_Ifirm_19	2.63	0.380468
_Ifirm_5	2.56	0.390499
_Ifirm_23	2.37	0.422594
_Ifirm_27	2.18	0.458041
_Ifirm_29	2.14	0.468356
_Ifirm_7	2.03	0.491783
_Ifirm_15	2.02	0.494326
_Ifirm_31	2.01	0.498695
_Ifirm_4	2.00	0.500577
_Ifirm_10	1.99	0.501949
_Ifirm_24	1.99	0.502784
_Ifirm_14	1.96	0.509130
_Ifirm_11	1.95	0.512046
_Ifirm_30	1.94	0.514422
_Ifirm_9	1.94	0.515368
_Ifirm_18	1.94	0.515806
_Ifirm_8	1.94	0.516550
_Ifirm_20	1.94	0.516631

```
    _Ifirm_16 |      1.94    0.516646
     _Ifirm_3 |      1.94    0.516666
-------------+----------------------
     Mean VIF |      5.58

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    51.36
         Prob > chi2  =   0.0000

. xtgls environmental totalltd i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1464.80
Log likelihood             = -335.9061          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    totalltd |  -.0294768   .0092759    -3.18   0.001    -.0476572   -.0112963
             |
        firm |
          2  |   15.16657   2.402845     6.31   0.000     10.45708    19.87606
          3  |   9.643768   1.336498     7.22   0.000      7.02428    12.26326
          4  |   3.911633   1.357807     2.88   0.004      1.25038    6.572885
          5  |   7.460102   1.537317     4.85   0.000     4.447016    10.47319
          6  |   21.14682   3.554407     5.95   0.000     14.18031    28.11333
          7  |   10.59475   1.369893     7.73   0.000     7.909813     13.2797
          8  |  -.5691002   1.336649    -0.43   0.670    -3.188884    2.050683
          9  |   3.241958    1.33818     2.42   0.015     .6191742    5.864743
         10  |   5.716839   1.355949     4.22   0.000     3.059227    8.374451
         11  |   2.018231   1.342514     1.50   0.133    -.6130473     4.64951
         12  |   39.73759    4.37584     9.08   0.000      31.1611    48.31407
         13  |   27.11041   2.952198     9.18   0.000     21.32421    32.89661
         14  |   4.141322   1.346353     3.08   0.002     1.502519    6.780125
         15  |    2.09208   1.366364     1.53   0.126    -.5859451    4.770105
         16  |   2.284336   1.336524     1.71   0.087    -.3352039    4.903876
         17  |   11.38534   1.629128     6.99   0.000     8.192305    14.57837
         18  |   .0104945   1.337612     0.01   0.994    -2.611177    2.632166
         19  |   9.044282    1.55745     5.81   0.000     5.991735    12.09683
         20  |  -.7285799   1.336544    -0.55   0.586    -3.348158    1.890998
         21  |    11.3685   2.971207     3.83   0.000     5.545044    17.19196
         22  |   32.80713   3.013166    10.89   0.000     26.90144    38.71283
         23  |   5.659238   1.477787     3.83   0.000     2.762829    8.555648
         24  |   4.362133   1.354824     3.22   0.001     1.706728    7.017539
         25  |   8.618629   1.558315     5.53   0.000     5.564388    11.67287
         26  |    14.7006   1.907597     7.71   0.000     10.96178    18.43942
         27  |   5.450046   1.419454     3.84   0.000     2.667967    8.232125
```

```
        28 |    16.7074   2.642482     6.32   0.000     11.52823    21.88657
        29 |   7.376627   1.403735     5.25   0.000     4.625357     10.1279
        30 |   1.455778   1.339411     1.09   0.277    -1.169419    4.080975
        31 |   5.080455   1.360367     3.73   0.000     2.414185    7.746725
           |
     _cons |   1.079635   .9450478     1.14   0.253     -.772625    2.931894
------------------------------------------------------------------------------

. xi: reg environmental totalliabilities i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   37.70
       Model |  6544.58811    31  211.115746           Prob > F      =  0.0000
    Residual |  688.721163   123  5.59935905           R-squared     =  0.9048
-------------+------------------------------           Adj R-squared =  0.8808
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.3663

--------------------------------------------------------------------------------
--
   environmental |      Coef.   Std. Err.      t    P>|t|     [95% Conf.
Interval]
-----------------+--------------------------------------------------------------
--
totalliabilities |  -.0156102   .0053021    -2.94   0.004    -.0261054   -
.0051151
        _Ifirm_2 |   20.05697   4.099305     4.89   0.000     11.94265
28.17129
        _Ifirm_3 |   9.431796   1.498238     6.30   0.000     6.466127
12.39747
        _Ifirm_4 |   4.875817   1.607257     3.03   0.003     1.694351
8.057283
        _Ifirm_5 |   8.050672   1.811428     4.44   0.000     4.465062
11.63628
        _Ifirm_6 |    24.3416   4.875409     4.99   0.000     14.69103
33.99217
        _Ifirm_7 |   13.03305   1.889019     6.90   0.000     9.293853
16.77225
        _Ifirm_8 |  -.6499184   1.496588    -0.43   0.665    -3.612323
2.312486
        _Ifirm_9 |    4.00083   1.532562     2.61   0.010     .9672179
7.034442
       _Ifirm_10 |   7.107774   1.660527     4.28   0.000     3.820862
10.39468
       _Ifirm_11 |   2.592547   1.532981     1.69   0.093    -.4418959
5.626989
       _Ifirm_12 |   50.30654   8.224476     6.12   0.000     34.02669
66.58638
       _Ifirm_13 |   31.26483    4.50796     6.94   0.000      22.3416
40.18806
       _Ifirm_14 |   5.118483   1.580254     3.24   0.002     1.990467
8.2465
       _Ifirm_15 |   2.477016    1.55919     1.59   0.115    -.6093056
5.563337
       _Ifirm_16 |   2.368089   1.497049     1.58   0.116    -.5952286
5.331407
       _Ifirm_17 |   15.73876   2.900133     5.43   0.000     9.998123
21.47939
       _Ifirm_18 |   .0544754   1.498399     0.04   0.971    -2.911514
3.020465
```

```
       _Ifirm_19 |   13.35257   2.766224     4.83   0.000     7.877003
18.82815
       _Ifirm_20 |  -.5987029   1.497631    -0.40   0.690    -3.563171
2.365765
       _Ifirm_21 |   14.49279   4.201003     3.45   0.001     6.177159
22.80841
       _Ifirm_22 |   38.30979   5.012468     7.64   0.000     28.38792
48.23167
       _Ifirm_23 |   6.231609   1.733611     3.59   0.000     2.800032
9.663186
       _Ifirm_24 |    4.54249    1.52654     2.98   0.004     1.520798
7.564181
       _Ifirm_25 |   8.887442   1.775974     5.00   0.000     5.372011
12.40287
       _Ifirm_26 |   16.86214   2.663526     6.33   0.000     11.58985
22.13443
       _Ifirm_27 |   5.872394   1.635462     3.59   0.000     2.635096
9.109691
       _Ifirm_28 |   18.97796    3.56138     5.33   0.000     11.92843
26.02749
       _Ifirm_29 |   8.548344   1.726715     4.95   0.000     5.130418
11.96627
       _Ifirm_30 |    1.93888    1.51889     1.28   0.204    -1.067668
4.945429
       _Ifirm_31 |   5.418021   1.546182     3.50   0.001     2.357448
8.478594
           _cons |   1.491059   1.067652     1.40   0.165    -.6222924
3.604411
--------------------------------------------------------------------------------
--

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
totalliabi~s |    102.49    0.009757
   _Ifirm_12 |     58.45    0.017108
   _Ifirm_22 |     21.71    0.046058
    _Ifirm_6 |     20.54    0.048684
   _Ifirm_13 |     17.56    0.056944
   _Ifirm_21 |     15.25    0.065570
    _Ifirm_2 |     14.52    0.068863
   _Ifirm_28 |     10.96    0.091237
   _Ifirm_17 |      7.27    0.137586
   _Ifirm_19 |      6.61    0.151229
   _Ifirm_26 |      6.13    0.163115
    _Ifirm_7 |      3.08    0.324292
    _Ifirm_5 |      2.84    0.352669
   _Ifirm_25 |      2.73    0.366890
   _Ifirm_23 |      2.60    0.385040
   _Ifirm_29 |      2.58    0.388121
   _Ifirm_10 |      2.38    0.419679
   _Ifirm_27 |      2.31    0.432641
    _Ifirm_4 |      2.23    0.447959
   _Ifirm_14 |      2.16    0.463399
   _Ifirm_15 |      2.10    0.476004
   _Ifirm_31 |      2.07    0.484047
   _Ifirm_11 |      2.03    0.492419
    _Ifirm_9 |      2.03    0.492689
   _Ifirm_24 |      2.01    0.496584
```

```
   _Ifirm_30 |      1.99    0.501599
   _Ifirm_18 |      1.94    0.515411
    _Ifirm_3 |      1.94    0.515522
   _Ifirm_20 |      1.94    0.515940
   _Ifirm_16 |      1.94    0.516341
    _Ifirm_8 |      1.94    0.516659
-------------+----------------------
    Mean VIF |     10.53

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    42.86
         Prob > chi2  =   0.0000

. xtgls environmental totalliabilities i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1472.89
Log likelihood             = -335.5199          Prob > chi2        =    0.0000

--------------------------------------------------------------------------------
--
   environmental |      Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-----------------+--------------------------------------------------------------
--
totalliabilities |  -.0156102   .0047232    -3.31   0.001    -.0248675    -
.006353
                 |
            firm |
              2  |   20.05697   3.651715     5.49   0.000     12.89974
27.2142
              3  |   9.431796    1.33465     7.07   0.000      6.81593
12.04766
              4  |   4.875817   1.431766     3.41   0.001     2.069608
7.682026
              5  |   8.050672   1.613644     4.99   0.000     4.887988
11.21336
              6  |    24.3416   4.343079     5.60   0.000     15.82932
32.85388
              7  |   13.03305   1.682764     7.75   0.000     9.734895
16.33121
              8  |  -.6499184   1.333181    -0.49   0.626    -3.262905
1.963068
              9  |    4.00083   1.365227     2.93   0.003     1.325035
6.676625
             10  |   7.107774    1.47922     4.81   0.000     4.208557
10.00699
```

```
             11  |   2.592547     1.3656     1.90   0.058    -.0839806
5.269074
             12  |   50.30654   7.326473     6.87   0.000     35.94692
64.66616
             13  |   31.26483   4.015751     7.79   0.000      23.3941
39.13556
             14  |   5.118483   1.407712     3.64   0.000     2.359419
7.877547
             15  |   2.477016   1.388947     1.78   0.075    -.2452711
5.199303
             16  |   2.368089   1.333592     1.78   0.076    -.2457026
4.98188
             17  |   15.73876   2.583477     6.09   0.000     10.67524
20.80228
             18  |   .0544754   1.334794     0.04   0.967    -2.561673
2.670623
             19  |   13.35257    2.46419     5.42   0.000     8.522852
18.1823
             20  |  -.5987029   1.334109    -0.45   0.654    -3.213509
2.016103
             21  |   14.49279   3.742309     3.87   0.000     7.157995
21.82758
             22  |   38.30979   4.465173     8.58   0.000     29.55822
47.06137
             23  |   6.231609   1.544324     4.04   0.000      3.20479
9.258429
             24  |    4.54249   1.359862     3.34   0.001     1.877209
7.20777
             25  |   8.887442   1.582061     5.62   0.000     5.786659
11.98823
             26  |   16.86214   2.372705     7.11   0.000     12.21172
21.51256
             27  |   5.872394   1.456892     4.03   0.000     3.016939
8.727849
             28  |   18.97796   3.172524     5.98   0.000     12.75993
25.19599
             29  |   8.548344   1.538181     5.56   0.000     5.533566
11.56312
             30  |    1.93888   1.353047     1.43   0.152    -.7130432
4.590804
             31  |   5.418021    1.37736     3.93   0.000     2.718445
8.117596
                 |
           _cons |   1.491059   .9510786     1.57   0.117    -.3730206
3.355139
--------------------------------------------------------------------------------
.
.
. xi: reg environmental ownersequity i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     155
-------------+------------------------------           F( 31,   123) =   36.65
       Model |  6526.71064    31  210.539053           Prob > F      =  0.0000
    Residual |  706.598634   123  5.74470434           R-squared     =  0.9023
-------------+------------------------------           Adj R-squared =  0.8777
       Total |  7233.30927   154  46.9695407           Root MSE      =  2.3968

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
ownersequity |   .0172535   .0074686     2.31   0.023     .0024699    .0320371
    _Ifirm_2 |   1.228832   3.619194     0.34   0.735     -5.93514    8.392803
    _Ifirm_3 |   9.678493   1.515971     6.38   0.000     6.677721    12.67926
    _Ifirm_4 |   2.444321   1.546365     1.58   0.117    -.6166141    5.505257
    _Ifirm_5 |   2.621573   1.843709     1.42   0.158    -1.027937    6.271082
    _Ifirm_6 |   8.717262   1.737863     5.02   0.000     5.277268    12.15726
    _Ifirm_7 |   7.446701   1.788514     4.16   0.000     3.906446    10.98696
    _Ifirm_8 |  -.1018786   1.533212    -0.07   0.947    -3.136778    2.933021
    _Ifirm_9 |   1.802166   1.606181     1.12   0.264    -1.377171    4.981502
   _Ifirm_10 |   .6729982   2.406099     0.28   0.780    -4.089727    5.435724
   _Ifirm_11 |   .8530338   1.551327     0.55   0.583    -2.217723     3.92379
   _Ifirm_12 |   18.35335   3.837109     4.78   0.000     10.75803    25.94867
   _Ifirm_13 |    12.3421   3.159241     3.91   0.000      6.08858    18.59563
   _Ifirm_14 |   2.669608   1.571233     1.70   0.092    -.4405507    5.779767
   _Ifirm_15 |   .7450914   1.528018     0.49   0.627    -2.279526    3.769709
   _Ifirm_16 |   1.668079   1.537192     1.09   0.280    -1.374698    4.710856
   _Ifirm_17 |    4.04356    2.42796     1.67   0.098    -.7624374    8.849557
   _Ifirm_18 |  -.0213419   1.517116    -0.01   0.989    -3.024381    2.981697
   _Ifirm_19 |  -7.879781   6.407875    -1.23   0.221    -20.56378    4.804216
   _Ifirm_20 |  -.7288631   1.515953    -0.48   0.632    -3.729599    2.271873
   _Ifirm_21 |   .1057461   1.949008     0.05   0.957    -3.752196    3.963689
   _Ifirm_22 |   15.06695    4.24437     3.55   0.001     6.665476    23.46841
   _Ifirm_23 |   2.582812   1.585386     1.63   0.106    -.5553633    5.720987
   _Ifirm_24 |    2.89414   1.551372     1.87   0.064    -.1767061    5.964987
   _Ifirm_25 |   4.735575   1.622543     2.92   0.004      1.52385    7.947299
   _Ifirm_26 |   9.127706   1.609188     5.67   0.000     5.942416      12.313
   _Ifirm_27 |   2.605831    1.62072     1.61   0.110    -.6022844    5.813947
   _Ifirm_28 |   8.289951   1.598718     5.19   0.000     5.125388    11.45451
   _Ifirm_29 |   3.365675   1.900183     1.77   0.079    -.3956204     7.12697
   _Ifirm_30 |   .1853597   1.575269     0.12   0.907    -2.932788    3.303508
   _Ifirm_31 |    2.84188   1.637772     1.74   0.085    -.3999888    6.083748
       _cons |   .2734578    1.12659     0.24   0.809    -1.956559    2.503474
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
ownersequity |     55.42    0.018043
   _Ifirm_19 |     34.59    0.028914
   _Ifirm_22 |     15.17    0.065904
   _Ifirm_12 |     12.40    0.080636
    _Ifirm_2 |     11.03    0.090639
   _Ifirm_13 |      8.41    0.118952
   _Ifirm_17 |      4.97    0.201398
   _Ifirm_10 |      4.88    0.205074
   _Ifirm_21 |      3.20    0.312544
   _Ifirm_29 |      3.04    0.328812
    _Ifirm_5 |      2.86    0.349264
    _Ifirm_7 |      2.69    0.371153
    _Ifirm_6 |      2.54    0.393104
   _Ifirm_31 |      2.26    0.442620
   _Ifirm_25 |      2.22    0.450968
   _Ifirm_27 |      2.21    0.451983
   _Ifirm_26 |      2.18    0.458484
    _Ifirm_9 |      2.17    0.460203
   _Ifirm_28 |      2.15    0.464509
   _Ifirm_23 |      2.12    0.472354
   _Ifirm_30 |      2.09    0.478441
```

```
   _Ifirm_14 |      2.08    0.480903
   _Ifirm_24 |      2.03    0.493294
   _Ifirm_11 |      2.03    0.493323
    _Ifirm_4 |      2.01    0.496494
   _Ifirm_16 |      1.99    0.502438
    _Ifirm_8 |      1.98    0.505049
   _Ifirm_15 |      1.97    0.508489
   _Ifirm_18 |      1.94    0.515823
    _Ifirm_3 |      1.94    0.516602
   _Ifirm_20 |      1.94    0.516615
-------------+----------------------
    Mean VIF |      6.40

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of environmental

         chi2(1)      =    43.86
         Prob > chi2  =   0.0000

. xtgls environmental ownersequity i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       155
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         5
                                                Wald chi2(31)      =   1431.70
Log likelihood             = -337.5059          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
environmen~l |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ownersequity |   .0172535   .0066531     2.59   0.010     .0042137    .0302933
             |
        firm |
          2  |   1.228832   3.224026     0.38   0.703    -5.090143    7.547806
          3  |   9.678493   1.350447     7.17   0.000     7.031665    12.32532
          4  |   2.444321   1.377523     1.77   0.076    -.2555739    5.144216
          5  |   2.621573   1.642401     1.60   0.110    -.5974736    5.840619
          6  |   8.717262   1.548112     5.63   0.000     5.683019    11.75151
          7  |   7.446701   1.593232     4.67   0.000     4.324023    10.56938
          8  |  -.1018786   1.365806    -0.07   0.941    -2.778809    2.575052
          9  |   1.802166   1.430807     1.26   0.208    -1.002165    4.606497
         10  |   .6729982   2.143385     0.31   0.754    -3.527959    4.873956
         11  |   .8530338   1.381943     0.62   0.537    -1.855524    3.561592
         12  |   18.35335   3.418148     5.37   0.000      11.6539     25.0528
         13  |    12.3421   2.814294     4.39   0.000     6.826189    17.85802
         14  |   2.669608   1.399675     1.91   0.056    -.0737045    5.412921
         15  |   .7450914   1.361179     0.55   0.584     -1.92277    3.412953
         16  |   1.668079   1.369351     1.22   0.223    -1.015799    4.351957
         17  |    4.04356   2.162859     1.87   0.062    -.1955656    8.282685
         18  |  -.0213419   1.351467    -0.02   0.987    -2.670169    2.627486
         19  |  -7.879781   5.708221    -1.38   0.167    -19.06769    3.308126
```

```
          20  |  -.7288631   1.350431    -0.54   0.589     -3.37566    1.917933
          21  |   .1057461   1.736203     0.06   0.951    -3.297148    3.508641
          22  |   15.06695   3.780941     3.98   0.000     7.656437    22.47745
          23  |   2.582812   1.412283     1.83   0.067    -.1852126    5.350837
          24  |    2.89414   1.381983     2.09   0.036     .1855031    5.602777
          25  |   4.735575   1.445383     3.28   0.001     1.902676    7.568473
          26  |   9.127706   1.433487     6.37   0.000     6.318124    11.93729
          27  |   2.605831   1.443759     1.80   0.071    -.2238842    5.435547
          28  |   8.289951   1.424159     5.82   0.000     5.498651    11.08125
          29  |   3.365675   1.692708     1.99   0.047     .0480279    6.683322
          30  |   .1853597   1.403271     0.13   0.895       -2.565    2.935719
          31  |    2.84188   1.458949     1.95   0.051    -.0176074    5.701367
              |
        _cons |   .2734578   1.003582     0.27   0.785    -1.693526    2.240442
-------------------------------------------------------------------------------
---------------------------------------------

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Environment as
Independent 2001-2005.log
  log type:  text
 closed on:  25 Jun 2012, 19:27:06
```

Appendix H: Environment as the Dependent Variable 2006-2010

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Dependent 2006-2010.log
  log type:  text
 opened on:   8 Jul 2012, 19:16:45

. edit

. *(12 variables, 165 observations pasted into data editor)

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2006 to 2010
                delta:  1 unit

.
. xi: reg revtot env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  254.02
       Model |  78431679.5    33  2376717.56           Prob > F      =  0.0000
    Residual |  1225671.71   131  9356.27261           R-squared     =  0.9846
-------------+------------------------------           Adj R-squared =  0.9807
       Total |  79657351.2   164  485715.556           Root MSE      =  96.728

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   7.661326   2.801464     2.73   0.007     2.119363    13.20329
    _Ifirm_2 |   1375.257   70.09287    19.62   0.000     1236.597    1513.918
    _Ifirm_3 |  -140.3123   68.59272    -2.05   0.043    -276.0051   -4.619568
    _Ifirm_4 |   56.52513   62.49997     0.90   0.367    -67.11472     180.165
    _Ifirm_5 |   238.4301    62.5488     3.81   0.000     114.6937    362.1666
    _Ifirm_6 |   779.7599   68.71809    11.35   0.000     643.8191    915.7006
    _Ifirm_7 |   383.2709   68.59272     5.59   0.000     247.5781    518.9636
    _Ifirm_8 |  -46.24979   61.18556    -0.76   0.451    -167.2894    74.78984
    _Ifirm_9 |   109.9449   62.02242     1.77   0.079    -12.75027      232.64
   _Ifirm_10 |   260.0245   61.86279     4.20   0.000     137.6451    382.4038
   _Ifirm_11 |    25.1981   61.82551     0.41   0.684    -97.10749    147.5037
   _Ifirm_12 |   2355.464   103.7956    22.69   0.000     2150.132    2560.797
   _Ifirm_13 |   1256.901   89.65713    14.02   0.000     1079.538    1434.264
   _Ifirm_14 |   123.6678   61.38408     2.01   0.046     2.235479    245.1002
   _Ifirm_15 |   46.63799   61.29019     0.76   0.448    -74.60863    167.8846
   _Ifirm_16 |   5.285974   61.87206     0.09   0.932    -117.1117    127.6837
   _Ifirm_17 |    733.758   68.85411    10.66   0.000     597.5482    869.9679
   _Ifirm_18 |  -25.97209   61.19234    -0.42   0.672    -147.0251    95.08095
   _Ifirm_19 |   1015.726   67.38093    15.07   0.000     882.4308    1149.022
   _Ifirm_20 |   6.832445   61.21412     0.11   0.911    -114.2637    127.9286
   _Ifirm_21 |    714.568   67.26515    10.62   0.000     581.5015    847.6345
   _Ifirm_22 |   1368.913    115.894    11.81   0.000     1139.647    1598.179
   _Ifirm_23 |    322.436   63.23355     5.10   0.000     197.3449     447.527
   _Ifirm_24 |   18.66518    63.2533     0.30   0.768    -106.4649    143.7953
```

```
   _Ifirm_25 |   141.8872   64.20578     2.21   0.029     14.87286    268.9016
   _Ifirm_26 |   466.1537   86.03564     5.42   0.000     295.9547    636.3527
   _Ifirm_27 |   111.9814   62.62786     1.79   0.076    -11.91148    235.8742
   _Ifirm_28 |   453.4286   69.83677     6.49   0.000     315.2748    591.5824
   _Ifirm_29 |   2030.683   178.8243    11.36   0.000     1676.926     2384.44
   _Ifirm_30 |   304.5464   65.44714     4.65   0.000     175.0763    434.0164
   _Ifirm_31 |    1006.75   70.77727    14.22   0.000     866.7357    1146.764
   _Ifirm_32 |   38.16352    61.3121     0.62   0.535    -83.12645    159.4535
   _Ifirm_33 |   128.0308   63.50659     2.02   0.046     2.399575    253.6619
       _cons |   82.98254   43.39369     1.91   0.058    -2.860537    168.8256
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |     21.29    0.046973
   _Ifirm_29 |     16.57    0.060345
   _Ifirm_22 |      6.96    0.143673
   _Ifirm_12 |      5.58    0.179118
   _Ifirm_13 |      4.17    0.240064
   _Ifirm_26 |      3.84    0.260699
   _Ifirm_31 |      2.60    0.385220
    _Ifirm_2 |      2.55    0.392780
   _Ifirm_28 |      2.53    0.395666
   _Ifirm_17 |      2.46    0.407040
    _Ifirm_6 |      2.45    0.408653
    _Ifirm_3 |      2.44    0.410148
    _Ifirm_7 |      2.44    0.410148
   _Ifirm_19 |      2.35    0.425033
   _Ifirm_21 |      2.34    0.426498
   _Ifirm_30 |      2.22    0.450521
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of revtot

         chi2(1)      =   185.58
         Prob > chi2  =   0.0000
```

```
. xtgls revtot env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =  10558.48
Log likelihood             = -969.4518          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   7.661326   2.496196     3.07   0.002     2.768872    12.55378
             |
        firm |
          2  |   1375.257   62.45505    22.02   0.000     1252.848    1497.667
          3  |  -140.3123   61.11836    -2.30   0.022    -260.1021   -20.52254
          4  |   56.52513   55.68952     1.02   0.310    -52.62432    165.6746
          5  |   238.4301   55.73303     4.28   0.000     129.1954    347.6648
          6  |   779.7599   61.23007    12.73   0.000     659.7511    899.7686
          7  |   383.2709   61.11836     6.27   0.000     263.4811    503.0607
          8  |  -46.24979   54.51834    -0.85   0.396    -153.1038    60.60419
          9  |   109.9449   55.26401     1.99   0.047     1.629402    218.2603
         10  |   260.0245   55.12177     4.72   0.000     151.9878    368.0611
         11  |    25.1981   55.08855     0.46   0.647    -82.77347    133.1697
         12  |   2355.464   92.48529    25.47   0.000     2174.196    2536.732
         13  |   1256.901   79.88744    15.73   0.000     1100.325    1413.478
         14  |   123.6678   54.69523     2.26   0.024     16.46716    230.8685
         15  |   46.63799   54.61157     0.85   0.393    -60.39872    153.6747
         16  |   5.285974   55.13004     0.10   0.924    -102.7669    113.3389
         17  |    733.758   61.35127    11.96   0.000     613.5117    854.0043
         18  |  -25.97209   54.52438    -0.48   0.634    -132.8379    80.89373
         19  |   1015.726   60.03862    16.92   0.000     898.0528      1133.4
         20  |   6.832445   54.54379     0.13   0.900    -100.0714    113.7363
         21  |    714.568   59.93545    11.92   0.000     597.0967    832.0394
         22  |   1368.913   103.2653    13.26   0.000     1166.517     1571.31
         23  |    322.436   56.34317     5.72   0.000     212.0054    432.8665
         24  |   18.66518   56.36077     0.33   0.741    -91.79989    129.1303
         25  |   141.8872   57.20946     2.48   0.013     29.75874    254.0157
         26  |   466.1537   76.66057     6.08   0.000     315.9018    616.4057
         27  |   111.9814   55.80347     2.01   0.045     2.608566    221.3542
         28  |   453.4286   62.22685     7.29   0.000     331.4662     575.391
         29  |   2030.683   159.3383    12.74   0.000     1718.386    2342.981
         30  |   304.5464   58.31554     5.22   0.000       190.25    418.8428
         31  |    1006.75   63.06487    15.96   0.000     883.1451    1130.355
         32  |   38.16352   54.63109     0.70   0.485    -68.91146    145.2385
         33  |   128.0308   56.58645     2.26   0.024     17.12335    238.9382
             |
       _cons |   82.98254    38.6652     2.15   0.032     7.200135    158.7649
------------------------------------------------------------------------------

.
. xi: reg cos env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)
```

Source	SS	df	MS
Model	36218767.3	33	1097538.4
Residual	685348.296	131	5231.66638
Total	36904115.6	164	225025.095

Number of obs	=	165
F(33, 131)	=	209.79
Prob > F	=	0.0000
R-squared	=	0.9814
Adj R-squared	=	0.9768
Root MSE	=	72.33

cos	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	3.198432	2.094853	1.53	0.129	-.9456871	7.342552
_Ifirm_2	1015.159	52.41341	19.37	0.000	911.4726	1118.845
_Ifirm_3	-76.35024	51.29164	-1.49	0.139	-177.8173	25.11686
_Ifirm_4	43.59784	46.73566	0.93	0.353	-48.85644	136.0521
_Ifirm_5	175.3607	46.77218	3.75	0.000	82.83417	267.8872
_Ifirm_6	620.9558	51.38539	12.08	0.000	519.3032	722.6084
_Ifirm_7	289.3624	51.29164	5.64	0.000	187.8953	390.8295
_Ifirm_8	-31.102	45.75278	-0.68	0.498	-121.6119	59.40791
_Ifirm_9	81.10991	46.37856	1.75	0.083	-10.63795	172.8578
_Ifirm_10	163.4549	46.2592	3.53	0.001	71.94318	254.9666
_Ifirm_11	18.36212	46.23132	0.40	0.692	-73.09445	109.8187
_Ifirm_12	1874.811	77.61534	24.16	0.000	1721.269	2028.352
_Ifirm_13	1088.252	67.04299	16.23	0.000	955.6249	1220.879
_Ifirm_14	81.89035	45.90123	1.78	0.077	-8.913235	172.6939
_Ifirm_15	36.63417	45.83103	0.80	0.426	-54.03053	127.2989
_Ifirm_16	16.6041	46.26613	0.36	0.720	-74.92134	108.1295
_Ifirm_17	525.5191	51.48711	10.21	0.000	423.6653	627.3729
_Ifirm_18	-20.88159	45.75785	-0.46	0.649	-111.4015	69.63836
_Ifirm_19	637.9347	50.3855	12.66	0.000	538.2601	737.6092
_Ifirm_20	2.917158	45.77414	0.06	0.949	-87.63502	93.46933
_Ifirm_21	607.2737	50.29892	12.07	0.000	507.7705	706.777
_Ifirm_22	1027.159	86.66215	11.85	0.000	855.7203	1198.597
_Ifirm_23	215.038	47.28421	4.55	0.000	121.4985	308.5774
_Ifirm_24	20.27784	47.29898	0.43	0.669	-73.29083	113.8465
_Ifirm_25	88.39727	48.01122	1.84	0.068	-6.580372	183.3749
_Ifirm_26	417.9706	64.33495	6.50	0.000	290.7008	545.2405
_Ifirm_27	98.21059	46.83129	2.10	0.038	5.567122	190.854
_Ifirm_28	381.5931	52.22191	7.31	0.000	278.2857	484.9005
_Ifirm_29	1078.707	133.7196	8.07	0.000	814.1781	1343.237
_Ifirm_30	229.1622	48.93947	4.68	0.000	132.3482	325.9761
_Ifirm_31	318.0804	52.92519	6.01	0.000	213.3818	422.7791
_Ifirm_32	11.46885	45.84741	0.25	0.803	-79.22827	102.166
_Ifirm_33	117.3446	47.48838	2.47	0.015	23.40123	211.2879
_cons	61.07492	32.44854	1.88	0.062	-3.116039	125.2659

. vif

Variable	VIF	1/VIF
env	21.29	0.046973
_Ifirm_29	16.57	0.060345
_Ifirm_22	6.96	0.143673
_Ifirm_12	5.58	0.179118
_Ifirm_13	4.17	0.240064
_Ifirm_26	3.84	0.260699
_Ifirm_31	2.60	0.385220
_Ifirm_2	2.55	0.392780
_Ifirm_28	2.53	0.395666

```
    _Ifirm_17 |      2.46    0.407040
     _Ifirm_6 |      2.45    0.408653
     _Ifirm_3 |      2.44    0.410148
     _Ifirm_7 |      2.44    0.410148
    _Ifirm_19 |      2.35    0.425033
    _Ifirm_21 |      2.34    0.426498
    _Ifirm_30 |      2.22    0.450521
    _Ifirm_25 |      2.14    0.468111
    _Ifirm_33 |      2.09    0.478475
    _Ifirm_24 |      2.07    0.482315
    _Ifirm_23 |      2.07    0.482616
    _Ifirm_27 |      2.03    0.491996
     _Ifirm_5 |      2.03    0.493241
     _Ifirm_4 |      2.02    0.494012
     _Ifirm_9 |      1.99    0.501648
    _Ifirm_16 |      1.98    0.504089
    _Ifirm_10 |      1.98    0.504241
    _Ifirm_11 |      1.98    0.504849
    _Ifirm_14 |      1.95    0.512136
    _Ifirm_32 |      1.95    0.513339
    _Ifirm_15 |      1.95    0.513706
    _Ifirm_20 |      1.94    0.514984
    _Ifirm_18 |      1.94    0.515350
     _Ifirm_8 |      1.94    0.515465
-------------+----------------------
     Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of cos

         chi2(1)      =   276.40
         Prob > chi2  =   0.0000

. xtgls cos env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   8719.79
Log likelihood             = -921.4932          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         cos |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   3.198432   1.866583     1.71   0.087    -.4600029    6.856868
             |
        firm |
          2  |   1015.159   46.70207    21.74   0.000     923.6245    1106.693
          3  |  -76.35024   45.70253    -1.67   0.095    -165.9256    13.22508
          4  |   43.59784     41.643     1.05   0.295    -38.02095    125.2166
          5  |   175.3607   41.67554     4.21   0.000     93.67813    257.0433
```

```
           6 |   620.9558   45.78607    13.56   0.000     531.2167    710.6948
           7 |   289.3624   45.70253     6.33   0.000      199.787    378.9377
           8 |    -31.102   40.76723    -0.76   0.446    -111.0043     48.8003
           9 |   81.10991   41.32482     1.96   0.050      .114757    162.1051
          10 |   163.4549   41.21846     3.97   0.000      82.6682    244.2416
          11 |   18.36212   41.19362     0.45   0.656    -62.37588    99.10013
          12 |   1874.811   69.15781    27.11   0.000     1739.264    2010.357
          13 |   1088.252    59.7375    18.22   0.000     971.1685    1205.335
          14 |   81.89035    40.8995     2.00   0.045     1.728801    162.0519
          15 |   36.63417   40.83695     0.90   0.370    -43.40477    116.6731
          16 |    16.6041   41.22464     0.40   0.687    -64.19471    97.40291
          17 |   525.5191    45.8767    11.46   0.000     435.6024    615.4358
          18 |  -20.88159   40.77175    -0.51   0.609    -100.7927    59.02957
          19 |   637.9347   44.89513    14.21   0.000     549.9418    725.9275
          20 |   2.917158   40.78626     0.07   0.943    -77.02245    82.85676
          21 |   607.2737   44.81799    13.55   0.000     519.4321    695.1154
          22 |   1027.159   77.21881    13.30   0.000     875.8126    1178.505
          23 |    215.038   42.13178     5.10   0.000     132.4612    297.6147
          24 |   20.27784   42.14494     0.48   0.630    -62.32473    102.8804
          25 |   88.39727   42.77957     2.07   0.039     4.550856    172.2437
          26 |   417.9706   57.32455     7.29   0.000     305.6166    530.3247
          27 |   98.21059   41.72821     2.35   0.019     16.42479    179.9964
          28 |   381.5931   46.53143     8.20   0.000     290.3931     472.793
          29 |   1078.707   119.1486     9.05   0.000     845.1805    1312.234
          30 |   229.1622   43.60667     5.26   0.000     143.6947    314.6297
          31 |   318.0804   47.15807     6.74   0.000     225.6523    410.5086
          32 |   11.46885   40.85155     0.28   0.779    -68.59871     91.5364
          33 |   117.3446   42.31371     2.77   0.006     34.41125    200.2779
             |
       _cons |   61.07492   28.91271     2.11   0.035     4.407039    117.7428
------------------------------------------------------------------------------

.
. xi: reg ni env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =    4.89
       Model |  114590.783    33  3472.44795           Prob > F      =  0.0000
    Residual |   93026.634   131  710.126977           R-squared     =  0.5519
-------------+------------------------------           Adj R-squared =  0.4391
       Total |  207617.417   164  1265.95986           Root MSE      =  26.648

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   .4125935   .7717944     0.53   0.594      -1.1142    1.939387
    _Ifirm_2 |   35.39644   19.31036     1.83   0.069    -2.804062    73.59695
    _Ifirm_3 |  -9.431461   18.89708    -0.50   0.619    -46.81438    27.95146
    _Ifirm_4 |  -2.605762   17.21854    -0.15   0.880    -36.66814    31.45662
    _Ifirm_5 |   4.411615     17.232     0.26   0.798    -29.67738    38.50061
    _Ifirm_6 |   2.976858   18.93162     0.16   0.875    -34.47439    40.42811
    _Ifirm_7 |   14.63154   18.89708     0.77   0.440    -22.75138    52.01446
    _Ifirm_8 |  -5.300151   16.85643    -0.31   0.754    -38.64618    28.04588
    _Ifirm_9 |   5.624497   17.08698     0.33   0.743    -28.17762    39.42662
   _Ifirm_10 |    13.1276     17.043     0.77   0.443    -20.58752    46.84272
   _Ifirm_11 |  -2.116338   17.03273    -0.12   0.901    -35.81114    31.57846
   _Ifirm_12 |   41.56718   28.59536     1.45   0.148    -15.00126    98.13562
   _Ifirm_13 |  -15.26044   24.70025    -0.62   0.538    -64.12343    33.60255
   _Ifirm_14 |   .3043416   16.91112     0.02   0.986    -33.14988    33.75857
```

_Ifirm_15	-.5344472	16.88525	-0.03	0.975	-33.93751	32.86861
_Ifirm_16	-5.012361	17.04556	-0.29	0.769	-38.73254	28.70781
_Ifirm_17	6.67924	18.96909	0.35	0.725	-30.84614	44.20462
_Ifirm_18	-1.630253	16.85829	-0.10	0.923	-34.97998	31.71948
_Ifirm_19	128.8754	18.56323	6.94	0.000	92.1529	165.5979
_Ifirm_20	-.6782754	16.8643	-0.04	0.968	-34.03987	32.68332
_Ifirm_21	-1.511755	18.53133	-0.08	0.935	-38.17115	35.14764
_Ifirm_22	20.92791	31.92842	0.66	0.513	-42.23412	84.08995
_Ifirm_23	10.18488	17.42064	0.58	0.560	-24.27731	44.64706
_Ifirm_24	-1.189792	17.42608	-0.07	0.946	-35.66274	33.28316
_Ifirm_25	2.555504	17.68849	0.14	0.885	-32.43654	37.54755
_Ifirm_26	-1.551944	23.70254	-0.07	0.948	-48.44123	45.33734
_Ifirm_27	-2.463308	17.25377	-0.14	0.887	-36.59539	31.66877
_Ifirm_28	6.216576	19.23981	0.32	0.747	-31.84435	44.27751
_Ifirm_29	-.3611734	49.26553	-0.01	0.994	-97.82014	97.0978
_Ifirm_30	5.733379	18.03048	0.32	0.751	-29.93521	41.40196
_Ifirm_31	52.18843	19.49891	2.68	0.008	13.61493	90.76193
_Ifirm_32	1.484169	16.89129	0.09	0.930	-31.93083	34.89917
_Ifirm_33	1.809851	17.49586	0.10	0.918	-32.80114	36.42084
_cons	4.703585	11.95482	0.39	0.695	-18.94591	28.35308

. vif

Variable	VIF	1/VIF
env	21.29	0.046973
_Ifirm_29	16.57	0.060345
_Ifirm_22	6.96	0.143673
_Ifirm_12	5.58	0.179118
_Ifirm_13	4.17	0.240064
_Ifirm_26	3.84	0.260699
_Ifirm_31	2.60	0.385220
_Ifirm_2	2.55	0.392780
_Ifirm_28	2.53	0.395666
_Ifirm_17	2.46	0.407040
_Ifirm_6	2.45	0.408653
_Ifirm_3	2.44	0.410148
_Ifirm_7	2.44	0.410148
_Ifirm_19	2.35	0.425033
_Ifirm_21	2.34	0.426498
_Ifirm_30	2.22	0.450521
_Ifirm_25	2.14	0.468111
_Ifirm_33	2.09	0.478475
_Ifirm_24	2.07	0.482315
_Ifirm_23	2.07	0.482616
_Ifirm_27	2.03	0.491996
_Ifirm_5	2.03	0.493241
_Ifirm_4	2.02	0.494012
_Ifirm_9	1.99	0.501648
_Ifirm_16	1.98	0.504089
_Ifirm_10	1.98	0.504241
_Ifirm_11	1.98	0.504849
_Ifirm_14	1.95	0.512136
_Ifirm_32	1.95	0.513339
_Ifirm_15	1.95	0.513706
_Ifirm_20	1.94	0.514984
_Ifirm_18	1.94	0.515350
_Ifirm_8	1.94	0.515465

```
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ni

         chi2(1)      =    68.03
         Prob > chi2  =   0.0000

. xtgls ni env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =    203.25
Log likelihood             = -756.7372          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   .4125935   .6876941     0.60   0.549    -.9352621    1.760449
             |
        firm |
          2  |   35.39644   17.20617     2.06   0.040     1.672976    69.11991
          3  |  -9.431461   16.83791    -0.56   0.575    -42.43316    23.57024
          4  |  -2.605762   15.34228    -0.17   0.865    -32.67609    27.46456
          5  |   4.411615   15.35427     0.29   0.774    -25.68221    34.50544
          6  |   2.976858   16.86869     0.18   0.860    -30.08517    36.03888
          7  |   14.63154   16.83791     0.87   0.385    -18.37016    47.63324
          8  |  -5.300151   15.01963    -0.35   0.724    -34.73808    24.13778
          9  |   5.624497   15.22506     0.37   0.712    -24.21607    35.46506
         10  |    13.1276   15.18587     0.86   0.387    -16.63617    42.89136
         11  |  -2.116338   15.17672    -0.14   0.889    -31.86216    27.62949
         12  |   41.56718    25.4794     1.63   0.103    -8.371531    91.50589
         13  |  -15.26044   22.00873    -0.69   0.488    -58.39676    27.87589
         14  |   .3043416   15.06836     0.02   0.984     -29.2291    29.83778
         15  |  -.5344472   15.04531    -0.04   0.972    -30.02272    28.95383
         16  |  -5.012361   15.18815    -0.33   0.741    -34.78059    24.75586
         17  |    6.67924   16.90208     0.40   0.693    -26.44823    39.80671
         18  |  -1.630253   15.02129    -0.11   0.914    -31.07145    27.81094
         19  |   128.8754   16.54045     7.79   0.000     96.45672    161.2941
         20  |  -.6782754   15.02664    -0.05   0.964    -30.12995     28.7734
         21  |  -1.511755   16.51203    -0.09   0.927    -33.87473    30.85122
         22  |   20.92791   28.44927     0.74   0.462    -34.83163    76.68746
         23  |   10.18488   15.52236     0.66   0.512    -20.23839    40.60815
         24  |  -1.189792   15.52721    -0.08   0.939    -31.62257    29.24298
         25  |   2.555504   15.76102     0.16   0.871    -28.33553    33.44654
         26  |  -1.551944   21.11974    -0.07   0.941    -42.94588    39.84199
         27  |  -2.463308   15.37368    -0.16   0.873    -32.59516    27.66855
         28  |   6.216576    17.1433     0.36   0.717    -27.38367    39.81683
         29  |  -.3611734    43.8972    -0.01   0.993    -86.39811    85.67576
         30  |   5.733379   16.06575     0.36   0.721    -25.75491    37.22166
```

```
          31 |   52.18843   17.37417     3.00   0.003     18.13569    86.24118
          32 |   1.484169   15.05069     0.10   0.921    -28.01465    30.98298
          33 |   1.809851   15.58939     0.12   0.908    -28.74479    32.36449
             |
       _cons |   4.703585   10.65214     0.44   0.659    -16.17422     25.5814
------------------------------------------------------------------------------

.
. xi: reg curra env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  281.42
       Model |  20240372.1    33  613344.609           Prob > F      =  0.0000
    Residual |  285507.137   131  2179.44379           R-squared     =  0.9861
-------------+------------------------------           Adj R-squared =  0.9826
       Total |  20525879.2   164    125157.8           Root MSE      =  46.685

------------------------------------------------------------------------------
       curra |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   1.807647   1.352093     1.34   0.184    -.8671148    4.482408
    _Ifirm_2 |   608.7447   33.82948    17.99   0.000     541.8219    675.6675
    _Ifirm_3 |  -52.87148   33.10544    -1.60   0.113    -118.3619    12.61898
    _Ifirm_4 |   27.50419   30.16485     0.91   0.364    -32.16908    87.17746
    _Ifirm_5 |    122.961   30.18842     4.07   0.000     63.24113    182.6809
    _Ifirm_6 |   316.7171   33.16595     9.55   0.000     251.1069    382.3272
    _Ifirm_7 |   167.4947   33.10544     5.06   0.000     102.0042    232.9852
    _Ifirm_8 |  -27.46966   29.53047    -0.93   0.354    -85.88797    30.94865
    _Ifirm_9 |   71.93213   29.93437     2.40   0.018     12.71481    131.1494
   _Ifirm_10 |   148.0348   29.85733     4.96   0.000     88.96984    207.0997
   _Ifirm_11 |   2.976882   29.83933     0.10   0.921    -56.05243     62.0062
   _Ifirm_12 |   1117.333   50.09569    22.30   0.000     1018.232    1216.434
   _Ifirm_13 |   539.0873   43.27192    12.46   0.000     453.4851    624.6895
   _Ifirm_14 |    72.3753   29.62628     2.44   0.016     13.76744    130.9831
   _Ifirm_15 |   7.672114   29.58097     0.26   0.796     -50.8461    66.19033
   _Ifirm_16 |   .6192186    29.8618     0.02   0.983    -58.45455    59.69298
   _Ifirm_17 |   254.8895    33.2316     7.67   0.000     189.1495    320.6295
   _Ifirm_18 |  -8.751947   29.53374    -0.30   0.767    -67.17673    49.67284
   _Ifirm_19 |    855.883   32.52059    26.32   0.000     791.5496    920.2165
   _Ifirm_20 |   6.867285   29.54425     0.23   0.817     -51.5783    65.31287
   _Ifirm_21 |   255.4624   32.46471     7.87   0.000     191.2394    319.6853
   _Ifirm_22 |   836.7719   55.93482    14.96   0.000     726.1195    947.4244
   _Ifirm_23 |   131.5383   30.51891     4.31   0.000     71.16465     191.912
   _Ifirm_24 |   12.72048   30.52844     0.42   0.678    -47.67206    73.11301
   _Ifirm_25 |   99.16604   30.98814     3.20   0.002     37.86411     160.468
   _Ifirm_26 |   252.8631   41.52406     6.09   0.000     170.7186    335.0076
   _Ifirm_27 |   75.67152   30.22658     2.50   0.014     15.87615    135.4669
   _Ifirm_28 |   197.6269   33.70587     5.86   0.000     130.9486    264.3051
   _Ifirm_29 |   1269.003   86.30739    14.70   0.000     1098.266    1439.739
   _Ifirm_30 |   134.6352   31.58727     4.26   0.000     72.14801    197.1223
   _Ifirm_31 |   317.9175   34.15979     9.31   0.000     250.3413    385.4937
   _Ifirm_32 |   46.35589   29.59154     1.57   0.120    -12.18324     104.895
   _Ifirm_33 |   73.03263   30.65069     2.38   0.019     12.39826     133.667
       _cons |   56.94204   20.94344     2.72   0.007     15.51092    98.37316
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
```

```
-------------+----------------------
         env |     21.29    0.046973
   _Ifirm_29 |     16.57    0.060345
   _Ifirm_22 |      6.96    0.143673
   _Ifirm_12 |      5.58    0.179118
   _Ifirm_13 |      4.17    0.240064
   _Ifirm_26 |      3.84    0.260699
   _Ifirm_31 |      2.60    0.385220
    _Ifirm_2 |      2.55    0.392780
   _Ifirm_28 |      2.53    0.395666
   _Ifirm_17 |      2.46    0.407040
    _Ifirm_6 |      2.45    0.408653
    _Ifirm_3 |      2.44    0.410148
    _Ifirm_7 |      2.44    0.410148
   _Ifirm_19 |      2.35    0.425033
   _Ifirm_21 |      2.34    0.426498
   _Ifirm_30 |      2.22    0.450521
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of curra

         chi2(1)      =   319.84
         Prob > chi2  =   0.0000

. xtgls currs env i. firm
variable currs not found
r(111);

.
. xi: reg curra env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  281.42
       Model |  20240372.1    33  613344.609           Prob > F      =  0.0000
    Residual |  285507.137   131  2179.44379           R-squared     =  0.9861
-------------+------------------------------           Adj R-squared =  0.9826
       Total |  20525879.2   164    125157.8           Root MSE      =  46.685
```

curra	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	1.807647	1.352093	1.34	0.184	-.8671148	4.482408
_Ifirm_2	608.7447	33.82948	17.99	0.000	541.8219	675.6675
_Ifirm_3	-52.87148	33.10544	-1.60	0.113	-118.3619	12.61898
_Ifirm_4	27.50419	30.16485	0.91	0.364	-32.16908	87.17746
_Ifirm_5	122.961	30.18842	4.07	0.000	63.24113	182.6809
_Ifirm_6	316.7171	33.16595	9.55	0.000	251.1069	382.3272
_Ifirm_7	167.4947	33.10544	5.06	0.000	102.0042	232.9852
_Ifirm_8	-27.46966	29.53047	-0.93	0.354	-85.88797	30.94865
_Ifirm_9	71.93213	29.93437	2.40	0.018	12.71481	131.1494
_Ifirm_10	148.0348	29.85733	4.96	0.000	88.96984	207.0997
_Ifirm_11	2.976882	29.83933	0.10	0.921	-56.05243	62.0062
_Ifirm_12	1117.333	50.09569	22.30	0.000	1018.232	1216.434
_Ifirm_13	539.0873	43.27192	12.46	0.000	453.4851	624.6895
_Ifirm_14	72.3753	29.62628	2.44	0.016	13.76744	130.9831
_Ifirm_15	7.672114	29.58097	0.26	0.796	-50.8461	66.19033
_Ifirm_16	.6192186	29.8618	0.02	0.983	-58.45455	59.69298
_Ifirm_17	254.8895	33.2316	7.67	0.000	189.1495	320.6295
_Ifirm_18	-8.751947	29.53374	-0.30	0.767	-67.17673	49.67284
_Ifirm_19	855.883	32.52059	26.32	0.000	791.5496	920.2165
_Ifirm_20	6.867285	29.54425	0.23	0.817	-51.5783	65.31287
_Ifirm_21	255.4624	32.46471	7.87	0.000	191.2394	319.6853
_Ifirm_22	836.7719	55.93482	14.96	0.000	726.1195	947.4244
_Ifirm_23	131.5383	30.51891	4.31	0.000	71.16465	191.912
_Ifirm_24	12.72048	30.52844	0.42	0.678	-47.67206	73.11301
_Ifirm_25	99.16604	30.98814	3.20	0.002	37.86411	160.468
_Ifirm_26	252.8631	41.52406	6.09	0.000	170.7186	335.0076
_Ifirm_27	75.67152	30.22658	2.50	0.014	15.87615	135.4669
_Ifirm_28	197.6269	33.70587	5.86	0.000	130.9486	264.3051
_Ifirm_29	1269.003	86.30739	14.70	0.000	1098.266	1439.739
_Ifirm_30	134.6352	31.58727	4.26	0.000	72.14801	197.1223
_Ifirm_31	317.9175	34.15979	9.31	0.000	250.3413	385.4937
_Ifirm_32	46.35589	29.59154	1.57	0.120	-12.18324	104.895
_Ifirm_33	73.03263	30.65069	2.38	0.019	12.39826	133.667
_cons	56.94204	20.94344	2.72	0.007	15.51092	98.37316

. vif

Variable	VIF	1/VIF
env	21.29	0.046973
_Ifirm_29	16.57	0.060345
_Ifirm_22	6.96	0.143673
_Ifirm_12	5.58	0.179118
_Ifirm_13	4.17	0.240064
_Ifirm_26	3.84	0.260699
_Ifirm_31	2.60	0.385220
_Ifirm_2	2.55	0.392780
_Ifirm_28	2.53	0.395666
_Ifirm_17	2.46	0.407040
_Ifirm_6	2.45	0.408653
_Ifirm_3	2.44	0.410148
_Ifirm_7	2.44	0.410148
_Ifirm_19	2.35	0.425033
_Ifirm_21	2.34	0.426498
_Ifirm_30	2.22	0.450521

```
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of curra

         chi2(1)      =   319.84
         Prob > chi2  =   0.0000

. xtgls curra env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =  11697.30
Log likelihood             = -849.2512          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       curra |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   1.807647   1.204759     1.50   0.134     -.553637    4.168931
             |
        firm |
          2  |   608.7447   30.14317    20.20   0.000     549.6652    667.8242
          3  |  -52.87148   29.49804    -1.79   0.073    -110.6866    4.943606
          4  |   27.50419   26.87787     1.02   0.306    -25.17547    80.18385
          5  |    122.961   26.89887     4.57   0.000      70.2402    175.6818
          6  |   316.7171   29.55195    10.72   0.000     258.7963    374.6378
          7  |   167.4947   29.49804     5.68   0.000     109.6796    225.3098
          8  |  -27.46966   26.31261    -1.04   0.296    -79.04143    24.10212
          9  |   71.93213    26.6725     2.70   0.007     19.65498    124.2093
         10  |   148.0348   26.60386     5.56   0.000     95.89215    200.1774
         11  |   2.976882   26.58782     0.11   0.911    -49.13429    55.08806
         12  |   1117.333    44.6369    25.03   0.000     1029.846     1204.82
```

```
          13 |   539.0873    38.5567    13.98   0.000     463.5176    614.6571
          14 |    72.3753   26.39799     2.74   0.006     20.63619    124.1144
          15 |   7.672114   26.35761     0.29   0.771    -43.98786    59.33209
          16 |   .6192186   26.60784     0.02   0.981     -51.5312    52.76963
          17 |   254.8895   29.61045     8.61   0.000     196.8541    312.9249
          18 |  -8.751947   26.31553    -0.33   0.739    -60.32944    42.82555
          19 |    855.883   28.97691    29.54   0.000     799.0893    912.6767
          20 |   6.867285    26.3249     0.26   0.794    -44.72857    58.46314
          21 |   255.4624   28.92712     8.83   0.000     198.7663    312.1585
          22 |   836.7719   49.83976    16.79   0.000     739.0878    934.4561
          23 |   131.5383   27.19335     4.84   0.000     78.24035    184.8363
          24 |   12.72048   27.20184     0.47   0.640    -40.59415    66.03511
          25 |   99.16604   27.61145     3.59   0.000      45.0486    153.2835
          26 |   252.8631    36.9993     6.83   0.000     180.3458    325.3804
          27 |   75.67152   26.93287     2.81   0.005     22.88407     128.459
          28 |   197.6269   30.03304     6.58   0.000     138.7632    256.4905
          29 |   1269.003   76.90271    16.50   0.000     1118.276    1419.729
          30 |   134.6352   28.14529     4.78   0.000      79.4714    189.7989
          31 |   317.9175   30.43749    10.44   0.000     258.2611    377.5739
          32 |   46.35589   26.36704     1.76   0.079    -5.322545    98.03433
          33 |   73.03263   27.31077     2.67   0.007     19.50451    126.5607
             |
       _cons |   56.94204   18.66129     3.05   0.002     20.36658     93.5175
------------------------------------------------------------------------------

.
. xi: reg asset env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  256.19
       Model |  94395294.3    33  2860463.46           Prob > F      =  0.0000
    Residual |  1462676.94   131  11165.4728           R-squared     =  0.9847
-------------+------------------------------           Adj R-squared =  0.9809
       Total |  95857971.2   164  584499.824           Root MSE      =  105.67

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   4.760229   3.060357     1.56   0.122    -1.293888    10.81435
    _Ifirm_2 |   1255.798   76.57041    16.40   0.000     1104.324    1407.273
    _Ifirm_3 |  -83.50758   74.93162    -1.11   0.267    -231.7402    64.72505
    _Ifirm_4 |    124.197   68.27582     1.82   0.071    -10.86888    259.2628
    _Ifirm_5 |   374.0356   68.32917     5.47   0.000     238.8642     509.207
    _Ifirm_6 |   744.4103   75.06858     9.92   0.000     595.9067    892.9138
    _Ifirm_7 |     297.65   74.93162     3.97   0.000     149.4174    445.8827
    _Ifirm_8 |  -40.75111   66.83994    -0.61   0.543    -172.9765    91.47423
    _Ifirm_9 |   166.6898   67.75414     2.46   0.015     32.65591    300.7236
   _Ifirm_10 |   387.4213   67.57976     5.73   0.000     253.7324    521.1102
   _Ifirm_11 |   83.93357   67.53903     1.24   0.216    -49.67474    217.5419
   _Ifirm_12 |   2430.991   113.3877    21.44   0.000     2206.683    2655.299
   _Ifirm_13 |   1145.318   97.94267    11.69   0.000     951.5645    1339.072
   _Ifirm_14 |   173.5458   67.05681     2.59   0.011      40.8914    306.2001
   _Ifirm_15 |    83.1876   66.95425     1.24   0.216    -49.26387    215.6391
   _Ifirm_16 |   37.70206   67.58989     0.56   0.578    -96.00686     171.411
   _Ifirm_17 |   661.1459   75.21717     8.79   0.000     512.3484    809.9434
   _Ifirm_18 |  -5.570448   66.84735    -0.08   0.934    -137.8105    126.6696
   _Ifirm_19 |   1644.809   73.60785    22.35   0.000     1499.195    1790.423
   _Ifirm_20 |     10.957   66.87115     0.16   0.870    -121.3301    143.2441
   _Ifirm_21 |   846.9499   73.48137    11.53   0.000     701.5863    992.3136
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   _Ifirm_22 |   1998.498   126.6042    15.79   0.000     1748.045    2248.952
   _Ifirm_23 |   428.4729    69.0772     6.20   0.000     291.8218    565.1241
   _Ifirm_24 |    61.9432   69.09877     0.90   0.372    -74.75066     198.637
   _Ifirm_25 |   273.8253   70.13927     3.90   0.000     135.0731    412.5776
   _Ifirm_26 |   558.3156   93.98651     5.94   0.000     372.3879    744.2434
   _Ifirm_27 |   176.2166   68.41553     2.58   0.011     40.87442    311.5589
   _Ifirm_28 |   548.5796   76.29065     7.19   0.000     397.6585    699.5007
   _Ifirm_29 |   2693.905   195.3501    13.79   0.000     2307.456    3080.354
   _Ifirm_30 |    317.355   71.49535     4.44   0.000     175.9201    458.7898
   _Ifirm_31 |   1028.817   77.31806    13.31   0.000     875.8632     1181.77
   _Ifirm_32 |   110.3424   66.97818     1.65   0.102    -22.15643    242.8412
   _Ifirm_33 |   199.4378   69.37547     2.87   0.005     62.19653     336.679
       _cons |   82.15388   47.40386     1.73   0.085    -11.62227      175.93
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |     21.29    0.046973
   _Ifirm_29 |     16.57    0.060345
   _Ifirm_22 |      6.96    0.143673
   _Ifirm_12 |      5.58    0.179118
   _Ifirm_13 |      4.17    0.240064
   _Ifirm_26 |      3.84    0.260699
   _Ifirm_31 |      2.60    0.385220
    _Ifirm_2 |      2.55    0.392780
   _Ifirm_28 |      2.53    0.395666
   _Ifirm_17 |      2.46    0.407040
    _Ifirm_6 |      2.45    0.408653
    _Ifirm_3 |      2.44    0.410148
    _Ifirm_7 |      2.44    0.410148
   _Ifirm_19 |      2.35    0.425033
   _Ifirm_21 |      2.34    0.426498
   _Ifirm_30 |      2.22    0.450521
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of asset
```

```
        chi2(1)      =   378.06
        Prob > chi2  =   0.0000

. xtgls asset env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =  10648.44
Log likelihood             = -984.0361          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   4.760229   2.726879     1.75   0.081    -.5843553    10.10481
             |
        firm |
          2  |   1255.798   68.22675    18.41   0.000     1122.076     1389.52
          3  |  -83.50758   66.76653    -1.25   0.211    -214.3676    47.35242
          4  |    124.197   60.83599     2.04   0.041     4.960623    243.4333
          5  |   374.0356   60.88353     6.14   0.000     254.7061    493.3651
          6  |   744.4103   66.88857    11.13   0.000     613.3111    875.5095
          7  |     297.65   66.76653     4.46   0.000       166.79      428.51
          8  |  -40.75111   59.55658    -0.68   0.494    -157.4799    75.97763
          9  |   166.6898   60.37116     2.76   0.006     48.36447    285.0151
         10  |   387.4213   60.21578     6.43   0.000     269.4006    505.4421
         11  |   83.93357   60.17949     1.39   0.163    -34.01606    201.8832
         12  |   2430.991   101.0322    24.06   0.000     2232.972     2629.01
         13  |   1145.318   87.27013    13.12   0.000     974.2722    1316.365
         14  |   173.5458   59.74981     2.90   0.004     56.43828    290.6532
         15  |    83.1876   59.65843     1.39   0.163    -33.74077     200.116
         16  |   37.70206    60.2248     0.63   0.531    -80.33639    155.7405
         17  |   661.1459   67.02097     9.86   0.000     529.7873    792.5046
         18  |  -5.570448   59.56318    -0.09   0.925    -122.3121    111.1712
         19  |   1644.809     65.587    25.08   0.000     1516.261    1773.357
         20  |     10.957   59.58438     0.18   0.854    -105.8262    127.7402
         21  |   846.9499   65.47431    12.94   0.000     718.6227    975.2772
         22  |   1998.498   112.8085    17.72   0.000     1777.398    2219.599
         23  |   428.4729   61.55005     6.96   0.000     307.8371    549.1088
         24  |    61.9432   61.56927     1.01   0.314    -58.73036    182.6167
         25  |   273.8253   62.49639     4.38   0.000     151.3347     396.316
         26  |   558.3156   83.74506     6.67   0.000     394.1783    722.4529
         27  |   176.2166   60.96047     2.89   0.004     56.73631     295.697
         28  |   548.5796   67.97746     8.07   0.000     415.3462     681.813
         29  |   2693.905   174.0634    15.48   0.000     2352.747    3035.063
         30  |    317.355    63.7047     4.98   0.000     192.4961    442.2139
         31  |   1028.817   68.89292    14.93   0.000     893.7891    1163.844
         32  |   110.3424   59.67975     1.85   0.064    -6.627776    227.3126
         33  |   199.4378   61.81581     3.23   0.001     78.28099    320.5945
             |
       _cons |   82.15388   42.23839     1.95   0.052    -.6318507    164.9396
------------------------------------------------------------------------------
```

```
.
. xi: reg currl env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  143.55
       Model |  9348473.51    33  283287.076           Prob > F      =  0.0000
    Residual |  258511.891   131  1973.37322           R-squared     =  0.9731
-------------+------------------------------           Adj R-squared =  0.9663
       Total |   9606985.4   164  58579.1793           Root MSE      =  44.423

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.346522   1.286584     1.82   0.070    -.1986483    4.891693
    _Ifirm_2 |   426.0219   32.19045    13.23   0.000     362.3415    489.7023
    _Ifirm_3 |  -35.76539    31.5015    -1.14   0.258    -98.08286    26.55209
    _Ifirm_4 |   39.29582   28.70337     1.37   0.173     -17.4863    96.07795
    _Ifirm_5 |    107.377    28.7258     3.74   0.000     50.55049    164.2035
    _Ifirm_6 |    326.841   31.55908    10.36   0.000     264.4097    389.2724
    _Ifirm_7 |   88.08201    31.5015     2.80   0.006     25.76454    150.3995
    _Ifirm_8 |   1.792011   28.09973     0.06   0.949    -53.79595    57.37997
    _Ifirm_9 |   44.89693   28.48406     1.58   0.117    -11.45134    101.2452
   _Ifirm_10 |   52.74759   28.41075     1.86   0.066    -3.455649    108.9508
   _Ifirm_11 |   26.79426   28.39363     0.94   0.347    -29.37511    82.96362
   _Ifirm_12 |    934.491   47.66857    19.60   0.000     840.1912    1028.791
   _Ifirm_13 |    403.878   41.17542     9.81   0.000     322.4232    485.3328
   _Ifirm_14 |   77.19723    28.1909     2.74   0.007     21.42891    132.9656
   _Ifirm_15 |   27.89873   28.14778     0.99   0.323     -27.7843    83.58176
   _Ifirm_16 |   7.650299   28.41501     0.27   0.788    -48.56136    63.86196
   _Ifirm_17 |   251.6826   31.62154     7.96   0.000     189.1277    314.2376
   _Ifirm_18 |   6.374847   28.10284     0.23   0.821    -49.21928    61.96897
   _Ifirm_19 |   275.5005   30.94498     8.90   0.000      214.284    336.7171
   _Ifirm_20 |   8.189916   28.11285     0.29   0.771      -47.424    63.80383
   _Ifirm_21 |   326.5536   30.89181    10.57   0.000     265.4422     387.665
   _Ifirm_22 |      639.4    53.2248    12.01   0.000     534.1086    744.6914
   _Ifirm_23 |   123.4398   29.04028     4.25   0.000     65.99121    180.8884
   _Ifirm_24 |   11.01238   29.04935     0.38   0.705    -46.45416    68.47892
   _Ifirm_25 |   63.20278   29.48678     2.14   0.034     4.870896    121.5347
   _Ifirm_26 |    267.313   39.51223     6.77   0.000     189.1484    345.4776
   _Ifirm_27 |   56.33828   28.76211     1.96   0.052    -.5600294    113.2366
   _Ifirm_28 |   238.5122   32.07283     7.44   0.000     175.0645    301.9599
   _Ifirm_29 |   528.7313   82.12583     6.44   0.000     366.2668    691.1957
   _Ifirm_30 |   83.53665   30.05688     2.78   0.006     24.07698    142.9963
   _Ifirm_31 |   272.7993   32.50476     8.39   0.000     208.4971    337.1015
   _Ifirm_32 |   16.82445   28.15784     0.60   0.551    -38.87849    72.52738
   _Ifirm_33 |   58.20308   29.16567     2.00   0.048     .5064278    115.8997
       _cons |   18.34026   19.92874     0.92   0.359    -21.08354    57.76405
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |     21.29    0.046973
   _Ifirm_29 |     16.57    0.060345
   _Ifirm_22 |      6.96    0.143673
   _Ifirm_12 |      5.58    0.179118
   _Ifirm_13 |      4.17    0.240064
   _Ifirm_26 |      3.84    0.260699
```

```
   _Ifirm_31 |      2.60    0.385220
    _Ifirm_2 |      2.55    0.392780
   _Ifirm_28 |      2.53    0.395666
   _Ifirm_17 |      2.46    0.407040
    _Ifirm_6 |      2.45    0.408653
    _Ifirm_3 |      2.44    0.410148
    _Ifirm_7 |      2.44    0.410148
   _Ifirm_19 |      2.35    0.425033
   _Ifirm_21 |      2.34    0.426498
   _Ifirm_30 |      2.22    0.450521
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of currl

         chi2(1)      =   154.93
         Prob > chi2  =   0.0000

. xtgls currl env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   5966.84
Log likelihood             = -841.0569          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.346522   1.146389     2.05   0.041     .0996417    4.593403
             |
        firm |
          2  |   426.0219   28.68275    14.85   0.000     369.8048    482.2391
```

```
           3  |  -35.76539   28.06887    -1.27   0.203    -90.77935    19.24858
           4  |   39.29582   25.57565     1.54   0.124    -10.83152    89.42317
           5  |    107.377   25.59563     4.20   0.000     57.21046    157.5435
           6  |    326.841   28.12017    11.62   0.000     271.7265    381.9556
           7  |   88.08201   28.06887     3.14   0.002     33.06804     143.096
           8  |   1.792011   25.03778     0.07   0.943    -47.28113    50.86515
           9  |   44.89693   25.38023     1.77   0.077     -4.84741    94.64126
          10  |   52.74759   25.31491     2.08   0.037     3.131281    102.3639
          11  |   26.79426   25.29965     1.06   0.290    -22.79215    76.38066
          12  |    934.491   42.47426    22.00   0.000      851.243    1017.739
          13  |    403.878   36.68864    11.01   0.000     331.9695    475.7864
          14  |   77.19723   25.11901     3.07   0.002     27.96486    126.4296
          15  |   27.89873    25.0806     1.11   0.266    -21.25833     77.0558
          16  |   7.650299    25.3187     0.30   0.763    -41.97345    57.27404
          17  |   251.6826   28.17583     8.93   0.000      196.459    306.9063
          18  |   6.374847   25.04055     0.25   0.799    -42.70374    55.45343
          19  |   275.5005   27.57299     9.99   0.000     221.4584    329.5426
          20  |   8.189916   25.04947     0.33   0.744    -40.90614    57.28597
          21  |   326.5536   27.52561    11.86   0.000     272.6044    380.5028
          22  |      639.4   47.42504    13.48   0.000     546.4486    732.3514
          23  |   123.4398   25.87584     4.77   0.000      72.7241    174.1555
          24  |   11.01238   25.88392     0.43   0.671    -39.71917    61.74393
          25  |   63.20278   26.27369     2.41   0.016      11.7073    114.6983
          26  |    267.313   35.20669     7.59   0.000     198.3091    336.3169
          27  |   56.33828   25.62798     2.20   0.028     6.108362    106.5682
          28  |   238.5122   28.57795     8.35   0.000     182.5005     294.524
          29  |   528.7313    73.1768     7.23   0.000     385.3074    672.1552
          30  |   83.53665   26.78166     3.12   0.002     31.04556    136.0277
          31  |   272.7993   28.96281     9.42   0.000     216.0332    329.5654
          32  |   16.82445   25.08956     0.67   0.502    -32.35019    65.99909
          33  |   58.20308   25.98757     2.24   0.025     7.268384    109.1378
              |
        _cons |   18.34026   17.75716     1.03   0.302    -16.46313    53.14365
------------------------------------------------------------------------------

.
. xi: reg ltd env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   38.16
       Model |  3019331.23    33  91494.8859           Prob > F      =  0.0000
    Residual |  314113.683   131  2397.81437           R-squared     =  0.9058
-------------+------------------------------           Adj R-squared =  0.8820
       Total |  3333444.92   164  20325.8836           Root MSE      =  48.967

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   .9171253   1.418213     0.65   0.519    -1.888438    3.722688
    _Ifirm_2 |   121.2475   35.48381     3.42   0.001     51.05207    191.4429
    _Ifirm_3 |  -10.22444   34.72437    -0.29   0.769    -78.91753    58.46864
    _Ifirm_4 |   16.64074   31.63997     0.53   0.600    -45.95068    79.23216
    _Ifirm_5 |   79.95633    31.6647     2.53   0.013     17.31601    142.5967
    _Ifirm_6 |   259.7761   34.78784     7.47   0.000     190.9575    328.5948
    _Ifirm_7 |   4.709155   34.72437     0.14   0.892    -63.98393    73.40224
    _Ifirm_8 |   4.110493   30.97457     0.13   0.895    -57.16459    65.38558
    _Ifirm_9 |  -1.158922   31.39822    -0.04   0.971    -63.27209    60.95425
   _Ifirm_10 |   29.40893   31.31741     0.94   0.349    -32.54438    91.36224
   _Ifirm_11 |    17.3444   31.29854     0.55   0.580    -44.57157    79.26037
```

```
    _Ifirm_12 |   535.9957   52.54548    10.20   0.000     432.0483    639.9432
    _Ifirm_13 |   276.9623   45.38801     6.10   0.000      187.174    366.7507
    _Ifirm_14 |   20.12517   31.07507     0.65   0.518    -41.34872    81.59907
    _Ifirm_15 |    11.2106   31.02754     0.36   0.718    -50.16927    72.59048
    _Ifirm_16 |   7.888768    31.3221     0.25   0.802    -54.07383    69.85136
    _Ifirm_17 |   52.73953    34.8567     1.51   0.133    -16.21533    121.6944
    _Ifirm_18 |   .3662311     30.978     0.01   0.991    -60.91565    61.64811
    _Ifirm_19 |   14.75391   34.11091     0.43   0.666    -52.72561    82.23343
    _Ifirm_20 |   1.829092   30.98903     0.06   0.953     -59.4746    63.13279
    _Ifirm_21 |   220.1383    34.0523     6.46   0.000     152.7747    287.5019
    _Ifirm_22 |   415.0273   58.67015     7.07   0.000     298.9637    531.0908
    _Ifirm_23 |   128.7181   32.01135     4.02   0.000     65.39202    192.0442
    _Ifirm_24 |   2.912401   32.02134     0.09   0.928    -60.43345    66.25826
    _Ifirm_25 |   51.60498   32.50353     1.59   0.115    -12.69475    115.9047
    _Ifirm_26 |   152.7578   43.55467     3.51   0.001     66.59627    238.9193
    _Ifirm_27 |   34.97321   31.70472     1.10   0.272    -27.74629     97.6927
    _Ifirm_28 |   163.8067   35.35416     4.63   0.000     93.86773    233.7456
    _Ifirm_29 |   143.3115     90.528     1.58   0.116    -35.77447    322.3975
    _Ifirm_30 |   23.59536   33.13195     0.71   0.478    -41.94754    89.13826
    _Ifirm_31 |   225.6486   35.83028     6.30   0.000     154.7677    296.5294
    _Ifirm_32 |   10.14757   31.03863     0.33   0.744    -51.25425    71.54938
    _Ifirm_33 |   37.87368   32.14957     1.18   0.241    -25.72584    101.4732
        _cons |  -.8915613   21.96762    -0.04   0.968    -44.34875    42.56563
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |     21.29    0.046973
   _Ifirm_29 |     16.57    0.060345
   _Ifirm_22 |      6.96    0.143673
   _Ifirm_12 |      5.58    0.179118
   _Ifirm_13 |      4.17    0.240064
   _Ifirm_26 |      3.84    0.260699
   _Ifirm_31 |      2.60    0.385220
    _Ifirm_2 |      2.55    0.392780
   _Ifirm_28 |      2.53    0.395666
   _Ifirm_17 |      2.46    0.407040
    _Ifirm_6 |      2.45    0.408653
    _Ifirm_3 |      2.44    0.410148
    _Ifirm_7 |      2.44    0.410148
   _Ifirm_19 |      2.35    0.425033
   _Ifirm_21 |      2.34    0.426498
   _Ifirm_30 |      2.22    0.450521
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
```

```
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ltd

         chi2(1)      =   563.89
         Prob > chi2  =   0.0000

. xtgls ltd env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   1586.02
Log likelihood             =  -857.129          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   .9171253   1.263674     0.73   0.468     -1.55963    3.393881
             |
        firm |
          2  |   121.2475   31.61723     3.83   0.000     59.27886    183.2161
          3  |  -10.22444   30.94055    -0.33   0.741    -70.86681    50.41792
          4  |   16.64074   28.19225     0.59   0.555    -38.61506    71.89654
          5  |   79.95633   28.21428     2.83   0.005     24.65736    135.2553
          6  |   259.7761    30.9971     8.38   0.000     199.0229    320.5293
          7  |   4.709155   30.94055     0.15   0.879    -55.93321    65.35152
          8  |   4.110493   27.59936     0.15   0.882    -49.98325    58.20424
          9  |  -1.158922   27.97684    -0.04   0.967    -55.99253    53.67468
         10  |   29.40893   27.90484     1.05   0.292    -25.28355    84.10141
         11  |    17.3444   27.88802     0.62   0.534    -37.31511    72.00392
         12  |   535.9957   46.81974    11.45   0.000     444.2307    627.7607
         13  |   276.9623   40.44221     6.85   0.000     197.6971    356.2276
         14  |   20.12517    27.6889     0.73   0.467    -34.14408    74.39443
         15  |    11.2106   27.64655     0.41   0.685    -42.97565    65.39686
         16  |   7.888768   27.90902     0.28   0.777    -46.81191    62.58945
         17  |   52.73953   31.05846     1.70   0.089    -8.133934     113.613
         18  |   .3662311   27.60242     0.01   0.989    -53.73351    54.46597
         19  |   14.75391   30.39394     0.49   0.627    -44.81712    74.32494
         20  |   1.829092   27.61224     0.07   0.947    -52.28991    55.94809
         21  |   220.1383   30.34172     7.26   0.000     160.6696     279.607
         22  |   415.0273   52.27703     7.94   0.000     312.5662    517.4884
         23  |   128.7181   28.52316     4.51   0.000     72.81374    184.6225
         24  |   2.912401   28.53207     0.10   0.919    -53.00942    58.83422
         25  |   51.60498   28.96171     1.78   0.075    -5.158928    108.3689
         26  |   152.7578   38.80864     3.94   0.000     76.69426    228.8213
         27  |   34.97321   28.24994     1.24   0.216    -20.39566    90.34207
```

```
          28 |   163.8067   31.50171     5.20   0.000     102.0645    225.5489
          29 |   143.3115   80.66342     1.78   0.076    -14.78588    301.4089
          30 |   23.59536   29.52165     0.80   0.424    -34.26602    81.45674
          31 |   225.6486   31.92595     7.07   0.000     163.0748    288.2223
          32 |   10.14757   27.65644     0.37   0.714    -44.05806    64.35319
          33 |   37.87368   28.64632     1.32   0.186    -18.27208    94.01943
             |
       _cons |  -.8915613   19.57387    -0.05   0.964    -39.25563    37.47251
------------------------------------------------------------------------------

.
. xi: reg liab env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  137.08
       Model |  27777535.2    33  841743.492           Prob > F      =  0.0000
    Residual |  804399.174   131  6140.45171           R-squared     =  0.9719
-------------+------------------------------           Adj R-squared =  0.9648
       Total |  28581934.4   164  174280.088           Root MSE      =  78.361

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.055616   2.269519     0.91   0.367    -2.434034    6.545265
    _Ifirm_2 |   717.0882   56.78356    12.63   0.000     604.7568    829.4196
    _Ifirm_3 |  -31.10949   55.56825    -0.56   0.577    -141.0367    78.81777
    _Ifirm_4 |   81.72637    50.6324     1.61   0.109    -18.43659    181.8893
    _Ifirm_5 |   221.6565   50.67196     4.37   0.000     121.4152    321.8977
    _Ifirm_6 |   654.5856   55.66982    11.76   0.000     544.4574    764.7138
    _Ifirm_7 |   127.1171   55.56825     2.29   0.024     17.18985    237.0444
    _Ifirm_8 |   8.202212   49.56757     0.17   0.869    -89.85427    106.2587
    _Ifirm_9 |   69.21048   50.24553     1.38   0.171    -30.18716    168.6081
   _Ifirm_10 |   119.9739   50.11621     2.39   0.018     20.83209    219.1157
   _Ifirm_11 |   56.70576   50.08601     1.13   0.260     -42.3763    155.7878
   _Ifirm_12 |   1666.653   84.08678    19.82   0.000     1500.309    1832.997
   _Ifirm_13 |   775.6748   72.63293    10.68   0.000     631.9896    919.3601
   _Ifirm_14 |   114.7646    49.7284     2.31   0.023     16.38993    213.1392
   _Ifirm_15 |   56.77777   49.65234     1.14   0.255     -41.4464    155.0019
   _Ifirm_16 |   25.72548   50.12372     0.51   0.609     -73.4312    124.8822
   _Ifirm_17 |   386.4877   55.78001     6.93   0.000     276.1415    496.8339
   _Ifirm_18 |   9.104231   49.57307     0.18   0.855    -88.96312    107.1716
   _Ifirm_19 |   350.6131   54.58656     6.42   0.000     242.6279    458.5983
   _Ifirm_20 |   9.466757   49.59071     0.19   0.849     -88.6355     107.569
   _Ifirm_21 |   658.9164   54.49276    12.09   0.000     551.1167    766.7161
   _Ifirm_22 |   1243.183   93.88789    13.24   0.000     1057.451    1428.916
   _Ifirm_23 |   302.0466   51.22669     5.90   0.000      200.708    403.3852
   _Ifirm_24 |   25.16563   51.24269     0.49   0.624    -76.20463    126.5359
   _Ifirm_25 |   153.7011   52.01431     2.95   0.004     50.80435    256.5978
   _Ifirm_26 |   475.5236   69.69909     6.82   0.000     337.6422    613.4051
   _Ifirm_27 |   101.5294     50.736     2.00   0.047     1.161527    201.8974
   _Ifirm_28 |   450.4259   56.57608     7.96   0.000     338.5049    562.3469
   _Ifirm_29 |   927.1615   144.8689     6.40   0.000     640.5762    1213.747
   _Ifirm_30 |   142.6367   53.01996     2.69   0.008      37.7506    247.5228
   _Ifirm_31 |   566.9006     57.338     9.89   0.000     453.4723    680.3288
   _Ifirm_32 |   51.11456   49.67009     1.03   0.305    -47.14473    149.3738
   _Ifirm_33 |   113.2918   51.44788     2.20   0.029      11.5156     215.068
       _cons |   20.23753   35.15405     0.58   0.566    -49.30556    89.78062
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |     21.29    0.046973
   _Ifirm_29 |     16.57    0.060345
   _Ifirm_22 |      6.96    0.143673
   _Ifirm_12 |      5.58    0.179118
   _Ifirm_13 |      4.17    0.240064
   _Ifirm_26 |      3.84    0.260699
   _Ifirm_31 |      2.60    0.385220
    _Ifirm_2 |      2.55    0.392780
   _Ifirm_28 |      2.53    0.395666
   _Ifirm_17 |      2.46    0.407040
    _Ifirm_6 |      2.45    0.408653
    _Ifirm_3 |      2.44    0.410148
    _Ifirm_7 |      2.44    0.410148
   _Ifirm_19 |      2.35    0.425033
   _Ifirm_21 |      2.34    0.426498
   _Ifirm_30 |      2.22    0.450521
   _Ifirm_25 |      2.14    0.468111
   _Ifirm_33 |      2.09    0.478475
   _Ifirm_24 |      2.07    0.482315
   _Ifirm_23 |      2.07    0.482616
   _Ifirm_27 |      2.03    0.491996
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of liab

         chi2(1)      =   520.00
         Prob > chi2  =   0.0000

. xtgls liab env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
```

```
                                                  Wald chi2(33)      =   5697.78
Log likelihood             = -934.7071            Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.055616   2.022215     1.02   0.309    -1.907854    6.019085
             |
        firm |
          2  |   717.0882   50.59601    14.17   0.000     617.9218    816.2546
          3  |  -31.10949   49.51313    -0.63   0.530    -128.1534    65.93447
          4  |   81.72637   45.11513     1.81   0.070    -6.697653    170.1504
          5  |   221.6565   45.15038     4.91   0.000     133.1634    310.1496
          6  |   654.5856   49.60363    13.20   0.000     557.3643     751.807
          7  |   127.1171   49.51313     2.57   0.010     30.07315    224.1611
          8  |   8.202212   44.16633     0.19   0.853     -78.3622    94.76663
          9  |   69.21048   44.77041     1.55   0.122    -18.53792    156.9589
         10  |   119.9739   44.65519     2.69   0.007     32.45136    207.4965
         11  |   56.70576   44.62827     1.27   0.204    -30.76404    144.1756
         12  |   1666.653   74.92407    22.24   0.000     1519.805    1813.502
         13  |   775.6748   64.71832    11.99   0.000     648.8292    902.5204
         14  |   114.7646   44.30963     2.59   0.010     27.91928    201.6098
         15  |   56.77777   44.24186     1.28   0.199    -29.93468    143.4902
         16  |   25.72548   44.66188     0.58   0.565     -61.8102    113.2612
         17  |   386.4877   49.70182     7.78   0.000     289.0739    483.9015
         18  |   9.104231   44.17123     0.21   0.837    -77.46979    95.67825
         19  |   350.6131   48.63841     7.21   0.000     255.2836    445.9426
         20  |   9.466757   44.18695     0.21   0.830    -77.13808    96.07159
         21  |   658.9164   48.55484    13.57   0.000     563.7507    754.0821
         22  |   1243.183   83.65719    14.86   0.000     1079.218    1407.149
         23  |   302.0466   45.64466     6.62   0.000     212.5847    391.5085
         24  |   25.16563   45.65892     0.55   0.582     -64.3242    114.6555
         25  |   153.7011   46.34646     3.32   0.001     62.86368    244.5385
         26  |   475.5236   62.10417     7.66   0.000     353.8017    597.2456
         27  |   101.5294   45.20744     2.25   0.025     12.92449    190.1344
         28  |   450.4259   50.41115     8.94   0.000     351.6218    549.2299
         29  |   927.1615    129.083     7.18   0.000     674.1635     1180.16
         30  |   142.6367   47.24252     3.02   0.003     50.04309    235.2304
         31  |   566.9006   51.09004    11.10   0.000     466.7659    667.0352
         32  |   51.11456   44.25768     1.15   0.248     -35.6289     137.858
         33  |   113.2918   45.84175     2.47   0.013     23.44361      203.14
             |
       _cons |   20.23753   31.32341     0.65   0.518    -41.15522    81.63028
------------------------------------------------------------------------------

.
. xi: reg oe env i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =  354.99
       Model |  28352076.9    33  859153.845           Prob > F      =  0.0000
    Residual |   317046.95   131  2420.20573           R-squared     =  0.9889
-------------+------------------------------           Adj R-squared =  0.9862
       Total |  28669123.8   164  174811.731           Root MSE      =  49.196

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.704611   1.424819     1.90   0.060    -.1140209    5.523243
```

_Ifirm_2	538.71	35.6491	15.11	0.000	468.1876	609.2324
_Ifirm_3	-52.39806	34.88612	-1.50	0.136	-121.4111	16.61501
_Ifirm_4	42.47062	31.78736	1.34	0.184	-20.41237	105.3536
_Ifirm_5	152.3791	31.8122	4.79	0.000	89.44703	215.3113
_Ifirm_6	89.82466	34.94989	2.57	0.011	20.68544	158.9639
_Ifirm_7	170.5329	34.88612	4.89	0.000	101.5199	239.546
_Ifirm_8	-48.95332	31.11886	-1.57	0.118	-110.5138	12.6072
_Ifirm_9	97.47929	31.54448	3.09	0.002	35.07678	159.8818
_Ifirm_10	267.4474	31.4633	8.50	0.000	205.2055	329.6893
_Ifirm_11	27.22781	31.44433	0.87	0.388	-34.97658	89.4322
_Ifirm_12	764.3379	52.79025	14.48	0.000	659.9062	868.7696
_Ifirm_13	369.6437	45.59944	8.11	0.000	279.4372	459.8503
_Ifirm_14	58.78121	31.21982	1.88	0.062	-2.979049	120.5415
_Ifirm_15	26.40982	31.17207	0.85	0.398	-35.25598	88.07562
_Ifirm_16	11.97659	31.46801	0.38	0.704	-50.27465	74.22782
_Ifirm_17	274.6582	35.01907	7.84	0.000	205.3822	343.9343
_Ifirm_18	-14.67468	31.12231	-0.47	0.638	-76.24202	46.89267
_Ifirm_19	1294.196	34.26981	37.76	0.000	1226.402	1361.99
_Ifirm_20	1.490242	31.13339	0.05	0.962	-60.09902	63.0795
_Ifirm_21	188.0335	34.21092	5.50	0.000	120.3562	255.7109
_Ifirm_22	755.315	58.94345	12.81	0.000	638.7108	871.9192
_Ifirm_23	126.4264	32.16046	3.93	0.000	62.8053	190.0474
_Ifirm_24	36.77758	32.17051	1.14	0.255	-26.86336	100.4185
_Ifirm_25	120.1243	32.65494	3.68	0.000	55.52502	184.7235
_Ifirm_26	82.79203	43.75756	1.89	0.061	-3.770865	169.3549
_Ifirm_27	74.68721	31.85241	2.34	0.021	11.67555	137.6989
_Ifirm_28	98.15376	35.51885	2.76	0.007	27.889	168.4185
_Ifirm_29	1766.743	90.9497	19.43	0.000	1586.823	1946.663
_Ifirm_30	174.7183	33.28629	5.25	0.000	108.8701	240.5665
_Ifirm_31	461.9162	35.99718	12.83	0.000	390.7052	533.1272
_Ifirm_32	59.22784	31.18322	1.90	0.060	-2.460004	120.9157
_Ifirm_33	86.14598	32.29933	2.67	0.009	22.2502	150.0418
_cons	61.91636	22.06995	2.81	0.006	18.25673	105.576

. vif

Variable	VIF	1/VIF
env	21.29	0.046973
_Ifirm_29	16.57	0.060345
_Ifirm_22	6.96	0.143673
_Ifirm_12	5.58	0.179118
_Ifirm_13	4.17	0.240064
_Ifirm_26	3.84	0.260699
_Ifirm_31	2.60	0.385220
_Ifirm_2	2.55	0.392780
_Ifirm_28	2.53	0.395666
_Ifirm_17	2.46	0.407040
_Ifirm_6	2.45	0.408653
_Ifirm_3	2.44	0.410148
_Ifirm_7	2.44	0.410148
_Ifirm_19	2.35	0.425033
_Ifirm_21	2.34	0.426498
_Ifirm_30	2.22	0.450521
_Ifirm_25	2.14	0.468111
_Ifirm_33	2.09	0.478475
_Ifirm_24	2.07	0.482315
_Ifirm_23	2.07	0.482616
_Ifirm_27	2.03	0.491996

```
    _Ifirm_5 |      2.03    0.493241
    _Ifirm_4 |      2.02    0.494012
    _Ifirm_9 |      1.99    0.501648
   _Ifirm_16 |      1.98    0.504089
   _Ifirm_10 |      1.98    0.504241
   _Ifirm_11 |      1.98    0.504849
   _Ifirm_14 |      1.95    0.512136
   _Ifirm_32 |      1.95    0.513339
   _Ifirm_15 |      1.95    0.513706
   _Ifirm_20 |      1.94    0.514984
   _Ifirm_18 |      1.94    0.515350
    _Ifirm_8 |      1.94    0.515465
-------------+----------------------
    Mean VIF |      3.54

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of oe

         chi2(1)      =   189.67
         Prob > chi2  =   0.0000

. xtgls oe env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =  14755.20
Log likelihood             = -857.8958          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.704611   1.269561     2.13   0.033     .2163183    5.192904
             |
        firm |
          2  |     538.71   31.76452    16.96   0.000     476.4527    600.9673
          3  |  -52.39806   31.08468    -1.69   0.092    -113.3229    8.526789
          4  |   42.47062   28.32358     1.50   0.134    -13.04258    97.98382
          5  |   152.3791   28.34571     5.38   0.000     96.82257    207.9357
          6  |   89.82466    31.1415     2.88   0.004     28.78845    150.8609
          7  |   170.5329   31.08468     5.49   0.000     109.6081    231.4578
          8  |  -48.95332   27.72792    -1.77   0.077     -103.299    5.392401
          9  |   97.47929   28.10717     3.47   0.001     42.39025    152.5683
         10  |   267.4474   28.03483     9.54   0.000     212.5002    322.3947
         11  |   27.22781   28.01793     0.97   0.331    -27.68633    82.14194
         12  |   764.3379   47.03784    16.25   0.000     672.1455    856.5304
         13  |   369.6437    40.6306     9.10   0.000     290.0092    449.2782
         14  |   58.78121   27.81789     2.11   0.035     4.259155    113.3033
         15  |   26.40982   27.77534     0.95   0.342    -28.02884    80.84849
         16  |   11.97659   28.03903     0.43   0.669     -42.9789    66.93207
         17  |   274.6582   31.20314     8.80   0.000     213.5012    335.8153
```

```
          18  |  -14.67468      27.731    -0.53   0.597    -69.02643    39.67708
          19  |   1294.196    30.53552    42.38   0.000     1234.348    1354.045
          20  |   1.490242    27.74087     0.05   0.957    -52.88086    55.86134
          21  |   188.0335    30.48305     6.17   0.000     128.2879    247.7792
          22  |    755.315    52.52055    14.38   0.000     652.3766    858.2534
          23  |   126.4264    28.65603     4.41   0.000     70.26158    182.5911
          24  |   36.77758    28.66498     1.28   0.199    -19.40474     92.9599
          25  |   120.1243    29.09662     4.13   0.000     63.09595    177.1526
          26  |   82.79203    38.98942     2.12   0.034     6.374168    159.2099
          27  |   74.68721    28.38154     2.63   0.008     19.06042     130.314
          28  |   98.15376    31.64846     3.10   0.002     36.12392    160.1836
          29  |   1766.743    81.03917    21.80   0.000     1607.909    1925.577
          30  |   174.7183    29.65917     5.89   0.000     116.5874    232.8492
          31  |   461.9162    32.07467    14.40   0.000      399.051    524.7814
          32  |   59.22784    27.78527     2.13   0.033     4.769713     113.686
          33  |   86.14598    28.77976     2.99   0.003     29.73869    142.5533
              |
       _cons  |   61.91636    19.66505     3.15   0.002     23.37357    100.4591
------------------------------------------------------------------------------

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Dependent 2006-2010.log
  log type:  text
 closed on:   8 Jul 2012, 19:19:12
```

Appendix I: Environment as the Independent Variable 2006-2010

```
------------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Independent 2006-2010.log
  log type:  text
 opened on:   8 Jul 2012, 19:19:32

. clear

. edit

. *(12 variables, 165 observations pasted into data editor)

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2006 to 2010
                delta:  1 unit

.
. xi: reg env revtot i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   85.37
       Model |  24251.9417    33  734.907325           Prob > F      =  0.0000
    Residual |  1127.76991   131  8.60893062           R-squared     =  0.9556
-------------+------------------------------           Adj R-squared =  0.9444
       Total |  25379.7116   164  154.754339           Root MSE      =  2.9341

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |   .0070494   .0025777     2.73   0.007      .0019501    .0121487
    _Ifirm_2 |    1.85814   4.216474     0.44   0.660     -6.483052    10.19933
    _Ifirm_3 |   11.46503   1.861187     6.16   0.000      7.783162    15.14691
    _Ifirm_4 |   3.922449   1.870622     2.10   0.038      .2219132    7.622984
    _Ifirm_5 |   2.719975   1.985616     1.37   0.173     -1.208048    6.647998
    _Ifirm_6 |    5.07238   2.901596     1.75   0.083     -.6676697    10.81243
    _Ifirm_7 |   7.774102   2.213499     3.51   0.001      3.395273    12.15293
    _Ifirm_8 |  -.0381752   1.860015    -0.02   0.984     -3.717729    3.641378
    _Ifirm_9 |     2.6731   1.889411     1.41   0.160     -1.064605    6.410805
   _Ifirm_10 |   1.270982   1.995968     0.64   0.525     -2.677519    5.219483
   _Ifirm_11 |   2.840464   1.860093     1.53   0.129     -.8392439    6.520171
   _Ifirm_12 |   11.71015   6.916357     1.69   0.093     -1.972053    25.39236
   _Ifirm_13 |   13.27208   4.141009     3.21   0.002      5.080175    21.46398
   _Ifirm_14 |   .8332765    1.88922     0.44   0.660     -2.904051    4.570604
   _Ifirm_15 |    .933753   1.861466     0.50   0.617     -2.748671    4.616177
   _Ifirm_16 |   3.087729   1.857361     1.66   0.099     -.5865753    6.762033
   _Ifirm_17 |   5.497128   2.813037     1.95   0.053     -.0677297    11.06199
   _Ifirm_18 |  -.2936933   1.857279    -0.16   0.875     -3.967835    3.380448
   _Ifirm_19 |   2.376887   3.373561     0.70   0.482     -4.296822    9.050595
   _Ifirm_20 |  -.7771003   1.855688    -0.42   0.676     -4.448094    2.893893
   _Ifirm_21 |    4.40621   2.757067     1.60   0.112     -1.047926    9.860346
   _Ifirm_22 |   23.58841   4.612298     5.11   0.000      14.46419    32.71264
```

```
    _Ifirm_23 |   3.129593   2.081962     1.50   0.135    -.9890255    7.248211
    _Ifirm_24 |   5.297284   1.862696     2.84   0.005     1.612427    8.982141
    _Ifirm_25 |   5.581243   1.922685     2.90   0.004     1.777713    9.384773
    _Ifirm_26 |   17.14167   2.468628     6.94   0.000     12.25814    22.02521
    _Ifirm_27 |   3.737744   1.894831     1.97   0.051    -.0106847    7.486172
    _Ifirm_28 |   8.178227   2.328332     3.51   0.001     3.572231    12.78422
    _Ifirm_29 |   42.42654   6.681868     6.35   0.000     29.20821    55.64487
    _Ifirm_30 |   5.706012   2.084252     2.74   0.007     1.582865    9.829159
    _Ifirm_31 |    4.92226   3.397547     1.45   0.150    -1.798899    11.64342
    _Ifirm_32 |   1.109472   1.860038     0.60   0.552    -2.570126     4.78907
    _Ifirm_33 |   4.853639   1.909514     2.54   0.012     1.076165    8.631113
        _cons |   .5729202   1.333591     0.43   0.668    -2.065242    3.211082
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
      revtot |     61.48    0.016265
   _Ifirm_12 |     26.94    0.037118
   _Ifirm_29 |     25.15    0.039769
   _Ifirm_22 |     11.98    0.083466
    _Ifirm_2 |     10.01    0.099872
   _Ifirm_13 |      9.66    0.103545
   _Ifirm_31 |      6.50    0.153820
   _Ifirm_19 |      6.41    0.156015
    _Ifirm_6 |      4.74    0.210896
   _Ifirm_17 |      4.46    0.224384
   _Ifirm_21 |      4.28    0.233587
   _Ifirm_26 |      3.43    0.291361
   _Ifirm_28 |      3.05    0.327532
    _Ifirm_7 |      2.76    0.362397
   _Ifirm_30 |      2.45    0.408736
   _Ifirm_23 |      2.44    0.409635
   _Ifirm_10 |      2.24    0.445693
    _Ifirm_5 |      2.22    0.450352
   _Ifirm_25 |      2.08    0.480316
   _Ifirm_33 |      2.05    0.486965
   _Ifirm_27 |      2.02    0.494541
    _Ifirm_9 |      2.01    0.497382
   _Ifirm_14 |      2.01    0.497483
    _Ifirm_4 |      1.97    0.507424
   _Ifirm_24 |      1.95    0.511751
   _Ifirm_15 |      1.95    0.512428
    _Ifirm_3 |      1.95    0.512582
   _Ifirm_11 |      1.95    0.513185
   _Ifirm_32 |      1.95    0.513215
    _Ifirm_8 |      1.95    0.513228
   _Ifirm_16 |      1.94    0.514695
   _Ifirm_18 |      1.94    0.514741
   _Ifirm_20 |      1.94    0.515624
-------------+----------------------
    Mean VIF |      6.66

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env
```

```
        chi2(1)      =   146.48
        Prob > chi2  =   0.0000

. xtgls env revtot i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3548.22
Log likelihood             = -392.6941          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |   .0070494   .0022968     3.07   0.002     .0025477     .011551
             |
        firm |
          2  |    1.85814   3.757017     0.49   0.621    -5.505477    9.221758
          3  |   11.46503   1.658379     6.91   0.000     8.214671     14.7154
          4  |   3.922449   1.666785     2.35   0.019     .6556101    7.189287
          5  |   2.719975   1.769249     1.54   0.124      -.74769     6.18764
          6  |    5.07238   2.585417     1.96   0.050      .005055     10.1397
          7  |   7.774102     1.9723     3.94   0.000     3.908465    11.63974
          8  |  -.0381752   1.657334    -0.02   0.982    -3.286491     3.21014
          9  |     2.6731   1.683527     1.59   0.112    -.6265514    5.972752
         10  |   1.270982   1.778473     0.71   0.475    -2.214761    4.756725
         11  |   2.840464   1.657404     1.71   0.087    -.4079881    6.088915
         12  |   11.71015   6.162701     1.90   0.057    -.3685202    23.78882
         13  |   13.27208   3.689775     3.60   0.000     6.040253    20.50391
         14  |   .8332765   1.683357     0.50   0.621    -2.466042    4.132595
         15  |    .933753   1.658627     0.56   0.573    -2.317097    4.184603
         16  |   3.087729    1.65497     1.87   0.062    -.1559527     6.33141
         17  |   5.497128   2.506508     2.19   0.028     .5844628    10.40979
         18  |  -.2936933   1.654897    -0.18   0.859    -3.537231    2.949844
         19  |   2.376887   3.005953     0.79   0.429    -3.514674    8.268447
         20  |  -.7771003   1.653479    -0.47   0.638    -4.017859    2.463659
         21  |    4.40621   2.456637     1.79   0.073    -.4087102     9.22113
         22  |   23.58841   4.109708     5.74   0.000     15.53353    31.64329
         23  |   3.129593   1.855097     1.69   0.092      -.50633    6.765515
         24  |   5.297284   1.659723     3.19   0.001     2.044286    8.550282
         25  |   5.581243   1.713176     3.26   0.001     2.223481    8.939005
         26  |   17.14167   2.199629     7.79   0.000     12.83048    21.45286
         27  |   3.737744   1.688357     2.21   0.027     .4286251    7.046862
         28  |   8.178227    2.07462     3.94   0.000     4.112046    12.24441
         29  |   42.42654   5.953764     7.13   0.000     30.75738     54.0957
         30  |   5.706012   1.857137     3.07   0.002     2.066092    9.345933
         31  |    4.92226   3.027326     1.63   0.104     -1.01119    10.85571
         32  |   1.109472   1.657354     0.67   0.503    -2.138883    4.357826
         33  |   4.853639   1.701439     2.85   0.004     1.518879    8.188399
             |
       _cons |   .5729202   1.188274     0.48   0.630    -1.756053    2.901894
------------------------------------------------------------------------------

.
```

```
. xi: reg env cos i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   82.04
       Model |  24208.3997    33  733.587871           Prob > F      =  0.0000
    Residual |  1171.31188   131  8.94131203           R-squared     =  0.9538
-------------+------------------------------           Adj R-squared =  0.9422
       Total |  25379.7116   164  154.754339           Root MSE      =  2.9902

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cos |   .0054664   .0035803     1.53   0.129    -.0016163     .012549
    _Ifirm_2 |   6.449656   4.221668     1.53   0.129    -1.901811    14.80112
    _Ifirm_3 |   11.29774   1.896839     5.96   0.000     7.545342    15.05014
    _Ifirm_4 |    4.24942   1.902618     2.23   0.027      .485588    8.013251
    _Ifirm_5 |    3.61208   2.010083     1.80   0.075    -.3643432    7.588504
    _Ifirm_6 |   7.582892   3.017335     2.51   0.013     1.613883     13.5519
    _Ifirm_7 |   9.298625   2.220054     4.19   0.000     4.906829    13.69042
    _Ifirm_8 |  -.2082539    1.89471    -0.11   0.913    -3.956442    3.539934
    _Ifirm_9 |   3.137895   1.920114     1.63   0.105    -.6605483    6.936339
   _Ifirm_10 |   2.330329   1.991077     1.17   0.244    -1.608496    6.269153
   _Ifirm_11 |   3.034246   1.893934     1.60   0.112    -.7124071    6.780898
   _Ifirm_12 |    19.1595   7.304137     2.62   0.010      4.71017    33.60882
   _Ifirm_13 |   17.03817   4.573465     3.73   0.000     7.990765    26.08558
   _Ifirm_14 |   1.323245   1.917032     0.69   0.491    -2.469102    5.115592
   _Ifirm_15 |    1.11101   1.896832     0.59   0.559    -2.641375    4.863396
   _Ifirm_16 |    3.15488    1.89367     1.67   0.098    -.5912515    6.901012
   _Ifirm_17 |   8.208926   2.760298     2.97   0.004     2.748398    13.66945
   _Ifirm_18 |  -.3810419   1.892884    -0.20   0.841    -4.125618    3.363535
   _Ifirm_19 |   6.418153   3.055117     2.10   0.038     .3744027     12.4619
   _Ifirm_20 |  -.7730255   1.891171    -0.41   0.683    -4.514213    2.968162
   _Ifirm_21 |   6.488488   2.968807     2.19   0.031     .6154807     12.3615
   _Ifirm_22 |   28.90687   4.496852     6.43   0.000     20.01102    37.80271
   _Ifirm_23 |   4.435675   2.067422     2.15   0.034     .3458206    8.525529
   _Ifirm_24 |   5.527618   1.896222     2.92   0.004      1.77644    9.278797
   _Ifirm_25 |    6.35235   1.932217     3.29   0.001     2.529964    10.17474
   _Ifirm_26 |   18.93168   2.572371     7.36   0.000     13.84291    24.02044
   _Ifirm_27 |   4.165075   1.934348     2.15   0.033     .3384731    7.991677
   _Ifirm_28 |   9.727849    2.41624     4.03   0.000     4.947949    14.50775
   _Ifirm_29 |    53.0357    4.92637    10.77   0.000     43.29017    62.78124
   _Ifirm_30 |    6.90338   2.101119     3.29   0.001     2.746866    11.05989
   _Ifirm_31 |   10.74452   2.286036     4.70   0.000     6.222194    15.26684
   _Ifirm_32 |    1.36903   1.892052     0.72   0.471      -2.3739    5.111959
   _Ifirm_33 |   5.336967   1.953569     2.73   0.007     1.472341    9.201592
       _cons |   .8687422   1.357351     0.64   0.523    -1.816422    3.553907
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         cos |     52.91    0.018902
   _Ifirm_12 |     28.93    0.034567
   _Ifirm_29 |     13.16    0.075987
   _Ifirm_13 |     11.34    0.088167
   _Ifirm_22 |     10.97    0.091196
    _Ifirm_2 |      9.66    0.103473
   _Ifirm_19 |      5.06    0.197578
```

```
    _Ifirm_6 |      4.94    0.202557
   _Ifirm_21 |      4.78    0.209234
   _Ifirm_17 |      4.13    0.242038
   _Ifirm_26 |      3.59    0.278694
   _Ifirm_28 |      3.17    0.315875
   _Ifirm_31 |      2.83    0.352882
    _Ifirm_7 |      2.67    0.374169
   _Ifirm_30 |      2.39    0.417728
   _Ifirm_23 |      2.32    0.431456
    _Ifirm_5 |      2.19    0.456423
   _Ifirm_10 |      2.15    0.465178
   _Ifirm_33 |      2.07    0.483212
   _Ifirm_27 |      2.03    0.492863
   _Ifirm_25 |      2.02    0.493950
    _Ifirm_9 |      2.00    0.500197
   _Ifirm_14 |      1.99    0.501807
    _Ifirm_4 |      1.96    0.509439
    _Ifirm_3 |      1.95    0.512547
   _Ifirm_15 |      1.95    0.512552
   _Ifirm_24 |      1.95    0.512882
    _Ifirm_8 |      1.95    0.513700
   _Ifirm_11 |      1.95    0.514121
   _Ifirm_16 |      1.94    0.514264
   _Ifirm_18 |      1.94    0.514692
   _Ifirm_32 |      1.94    0.515145
   _Ifirm_20 |      1.94    0.515625
-------------+----------------------
    Mean VIF |      5.96

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   190.57
         Prob > chi2  =   0.0000

. xtgls env cos i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3410.18
Log likelihood             = -395.8194          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cos |   .0054664   .0031901     1.71   0.087    -.0007862    .0117189
             |
        firm |
          2  |   6.449656   3.761645     1.71   0.086    -.9230326    13.82234
          3  |   11.29774   1.690146     6.68   0.000     7.985117    14.61037
```

```
           4 |    4.24942   1.695295     2.51   0.012      .926703    7.572136
           5 |    3.61208    1.79105     2.02   0.044     .1016873    7.122473
           6 |   7.582892   2.688544     2.82   0.005     2.313441    12.85234
           7 |   9.298625    1.97814     4.70   0.000     5.421541    13.17571
           8 |  -.2082539   1.688249    -0.12   0.902     -3.51716    3.100653
           9 |   3.137895   1.710885     1.83   0.067    -.2153767    6.491168
          10 |   2.330329   1.774115     1.31   0.189    -1.146872    5.807529
          11 |   3.034246   1.687557     1.80   0.072    -.2733053    6.341797
          12 |    19.1595   6.508226     2.94   0.003     6.403608    31.91538
          13 |   17.03817   4.075107     4.18   0.000     9.051106    25.02523
          14 |   1.323245   1.708139     0.77   0.439    -2.024645    4.671135
          15 |    1.11101   1.690139     0.66   0.511    -2.201601    4.423622
          16 |    3.15488   1.687322     1.87   0.062    -.1522109    6.461971
          17 |   8.208926   2.459516     3.34   0.001     3.388363    13.02949
          18 |  -.3810419   1.686622    -0.23   0.821     -3.68676    2.924676
          19 |   6.418153    2.72221     2.36   0.018     1.082721    11.75359
          20 |  -.7730255   1.685095    -0.46   0.646    -4.075752    2.529701
          21 |   6.488488   2.645304     2.45   0.014     1.303788    11.67319
          22 |   28.90687   4.006843     7.21   0.000      21.0536    36.76014
          23 |   4.435675   1.842141     2.41   0.016      .825145    8.046205
          24 |   5.527618   1.689596     3.27   0.001     2.216072    8.839165
          25 |    6.35235   1.721669     3.69   0.000     2.977941    9.726759
          26 |   18.93168   2.292067     8.26   0.000     14.43931    23.42404
          27 |   4.165075   1.723568     2.42   0.016     .7869448    7.543205
          28 |   9.727849   2.152949     4.52   0.000     5.508146    13.94755
          29 |    53.0357   4.389557    12.08   0.000     44.43233    61.63907
          30 |    6.90338   1.872166     3.69   0.000     3.234002    10.57276
          31 |   10.74452   2.036933     5.27   0.000     6.752203    14.73683
          32 |    1.36903    1.68588     0.81   0.417    -1.935234    4.673294
          33 |   5.336967   1.740694     3.07   0.002     1.925269    8.748664
             |
       _cons |   .8687422   1.209445     0.72   0.473    -1.501725     3.23921
------------------------------------------------------------------------------

.
. xi: reg env ni i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   80.73
       Model |  24190.1515    33  733.034893           Prob > F      =  0.0000
    Residual |  1189.56015   131  9.08061184           R-squared     =  0.9531
-------------+------------------------------           Adj R-squared =  0.9413
       Total |  25379.7116   164  154.754339           Root MSE      =  3.0134

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |    .005276   .0098692     0.53   0.594    -.0142476    .0247995
    _Ifirm_2 |   11.99907   1.947176     6.16   0.000     8.147087    15.85104
    _Ifirm_3 |   11.09965   1.906449     5.82   0.000     7.328243    14.87106
    _Ifirm_4 |   4.571405   1.905858     2.40   0.018      .801163    8.341647
    _Ifirm_5 |   4.618598   1.906869     2.42   0.017     .8463564    8.390839
    _Ifirm_6 |   11.13257   1.907315     5.84   0.000     7.359449     14.9057
    _Ifirm_7 |    10.9727   1.915242     5.73   0.000     7.183892     14.7615
    _Ifirm_8 |  -.3561985   1.906606    -0.19   0.852     -4.12792    3.415523
    _Ifirm_9 |   3.607391   1.907143     1.89   0.061    -.1653928    7.380174
   _Ifirm_10 |   3.204797   1.911196     1.68   0.096    -.5760052    6.985599
   _Ifirm_11 |   3.194621   1.905861     1.68   0.096    -.5756274    6.964869
   _Ifirm_12 |   29.64674   1.978734    14.98   0.000     25.73233    33.56115
```

_Ifirm_13	23.42558	1.906648	12.29	0.000	19.65378	27.19739
_Ifirm_14	1.796871	1.905873	0.94	0.348	-1.973401	5.567142
_Ifirm_15	1.334514	1.905845	0.70	0.485	-2.435701	5.10473
_Ifirm_16	3.322654	1.906185	1.74	0.084	-.4482349	7.093543
_Ifirm_17	11.21901	1.909124	5.88	0.000	7.442306	14.99571
_Ifirm_18	-.4943017	1.905931	-0.26	0.796	-4.264688	3.276085
_Ifirm_19	9.379712	2.314318	4.05	0.000	4.801438	13.95799
_Ifirm_20	-.7652955	1.90587	-0.40	0.689	-4.535561	3.00497
_Ifirm_21	9.968845	1.906019	5.23	0.000	6.198286	13.7394
_Ifirm_22	34.9491	1.937647	18.04	0.000	31.11597	38.78223
_Ifirm_23	5.644833	1.90986	2.96	0.004	1.866675	9.422991
_Ifirm_24	5.732585	1.90588	3.01	0.003	1.962299	9.502871
_Ifirm_25	6.928572	1.906597	3.63	0.000	3.156869	10.70028
_Ifirm_26	21.55518	1.907228	11.30	0.000	17.78223	25.32813
_Ifirm_27	4.788179	1.905851	2.51	0.013	1.017951	8.558407
_Ifirm_28	11.96503	1.909035	6.27	0.000	8.188501	15.74155
_Ifirm_29	59.85234	1.920981	31.16	0.000	56.05218	63.6525
_Ifirm_30	8.252881	1.907987	4.33	0.000	4.478427	12.02733
_Ifirm_31	12.4024	1.988341	6.24	0.000	8.468986	16.33581
_Ifirm_32	1.446198	1.905956	0.76	0.449	-2.324238	5.216633
_Ifirm_33	6.062006	1.906322	3.18	0.002	2.290846	9.833165
_cons	1.19652	1.348616	0.89	0.377	-1.471364	3.864404

. vif

Variable	VIF	1/VIF
_Ifirm_19	2.86	0.349674
ni	2.23	0.449045
_Ifirm_31	2.11	0.473726
_Ifirm_12	2.09	0.478337
_Ifirm_2	2.02	0.493968
_Ifirm_22	2.00	0.498838
_Ifirm_29	1.97	0.507531
_Ifirm_7	1.96	0.510577
_Ifirm_10	1.95	0.512742
_Ifirm_23	1.95	0.513459
_Ifirm_17	1.95	0.513855
_Ifirm_28	1.95	0.513903
_Ifirm_30	1.94	0.514468
_Ifirm_6	1.94	0.514830
_Ifirm_26	1.94	0.514878
_Ifirm_9	1.94	0.514923
_Ifirm_5	1.94	0.515071
_Ifirm_13	1.94	0.515191
_Ifirm_8	1.94	0.515213
_Ifirm_25	1.94	0.515218
_Ifirm_3	1.94	0.515298
_Ifirm_33	1.94	0.515367
_Ifirm_16	1.94	0.515441
_Ifirm_21	1.94	0.515531
_Ifirm_32	1.94	0.515565
_Ifirm_18	1.94	0.515578
_Ifirm_24	1.94	0.515606
_Ifirm_14	1.94	0.515610
_Ifirm_20	1.94	0.515611
_Ifirm_11	1.94	0.515616
_Ifirm_4	1.94	0.515618
_Ifirm_27	1.94	0.515622

```
   _Ifirm_15 |      1.94    0.515625
-------------+----------------------
    Mean VIF |      1.99

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   216.06
         Prob > chi2  =   0.0000

. xtgls env ni i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3355.34
Log likelihood             = -397.0948          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |    .005276   .0087938     0.60   0.549    -.0119595    .0225114
             |
        firm |
          2  |   11.99907   1.734998     6.92   0.000     8.598533     15.3996
          3  |   11.09965   1.698708     6.53   0.000     7.770246    14.42906
          4  |   4.571405   1.698182     2.69   0.007     1.243029    7.899781
          5  |   4.618598   1.699083     2.72   0.007     1.288457    7.948739
          6  |   11.13257    1.69948     6.55   0.000     7.801653    14.46349
          7  |    10.9727   1.706544     6.43   0.000     7.627934    14.31746
          8  |  -.3561985   1.698849    -0.21   0.834    -3.685881    2.973484
          9  |   3.607391   1.699327     2.12   0.034     .2767714     6.93801
         10  |   3.204797   1.702938     1.88   0.060    -.1329012    6.542495
         11  |   3.194621   1.698185     1.88   0.060    -.1337604    6.523002
         12  |   29.64674   1.763117    16.81   0.000     26.19109    33.10238
         13  |   23.42558   1.698886    13.79   0.000     20.09583    26.75534
         14  |   1.796871   1.698195     1.06   0.290    -1.531531    5.125272
         15  |   1.334514    1.69817     0.79   0.432    -1.993838    4.662867
         16  |   3.322654   1.698473     1.96   0.050    -.0062927    6.651601
         17  |   11.21901   1.701092     6.60   0.000      7.88493    14.55309
         18  |  -.4943017   1.698247    -0.29   0.771    -3.822805    2.834202
         19  |   9.379712   2.062134     4.55   0.000     5.338005    13.42142
         20  |  -.7652955   1.698193    -0.45   0.652    -4.093692    2.563101
         21  |   9.968845   1.698325     5.87   0.000      6.64019     13.2975
         22  |    34.9491   1.726507    20.24   0.000     31.56521    38.33299
         23  |   5.644833   1.701748     3.32   0.001     2.309469    8.980197
         24  |   5.732585   1.698202     3.38   0.001     2.404171    9.060999
         25  |   6.928572    1.69884     4.08   0.000     3.598906    10.25824
         26  |   21.55518   1.699402    12.68   0.000     18.22441    24.88595
         27  |   4.788179   1.698176     2.82   0.005     1.459816    8.116542
         28  |   11.96503   1.701013     7.03   0.000     8.631104    15.29895
```

```
          29 |   59.85234   1.711657    34.97   0.000     56.49755    63.20713
          30 |   8.252881   1.700079     4.85   0.000     4.920787    11.58497
          31 |    12.4024   1.771677     7.00   0.000     8.929976    15.87482
          32 |   1.446198   1.698269     0.85   0.394    -1.882349    4.774744
          33 |   6.062006   1.698595     3.57   0.000      2.73282    9.391191
             |
       _cons |    1.19652   1.201661     1.00   0.319    -1.158693    3.551732
------------------------------------------------------------------------------

. xi: reg env curra i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   81.69
       Model |  24203.6032    33  733.442522           Prob > F      =  0.0000
    Residual |   1176.1084   131  8.97792668           R-squared     =  0.9537
-------------+------------------------------           Adj R-squared =  0.9420
       Total |  25379.7116   164  154.754339           Root MSE      =  2.9963

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0074464   .0055698     1.34   0.184     -.003572    .0184647
    _Ifirm_2 |   7.515085   3.991992     1.88   0.062    -.3820273     15.4122
    _Ifirm_3 |   11.31864   1.903853     5.95   0.000     7.552365    15.08491
    _Ifirm_4 |   4.301312   1.905477     2.26   0.026      .531824    8.070801
    _Ifirm_5 |    3.67377   2.031393     1.81   0.073    -.3448094     7.69235
    _Ifirm_6 |   8.663823   2.666932     3.25   0.001     3.387997    13.93965
    _Ifirm_7 |   9.677714    2.16378     4.47   0.000     5.397241    13.95819
    _Ifirm_8 |  -.1752688   1.901521    -0.09   0.927     -3.93693    3.586393
    _Ifirm_9 |   3.060304    1.94485     1.57   0.118     -.787072    6.907681
   _Ifirm_10 |   2.134714   2.080041     1.03   0.307    -1.980103    6.249531
   _Ifirm_11 |   3.125289   1.895664     1.65   0.102    -.6247869    6.875365
   _Ifirm_12 |   21.20825   6.794264     3.12   0.002     7.767575    34.64893
   _Ifirm_13 |   19.06684   3.751899     5.08   0.000     11.64469    26.48899
   _Ifirm_14 |   1.239207   1.941296     0.64   0.524     -2.60114    5.079553
   _Ifirm_15 |   1.259506   1.895871     0.66   0.508    -2.490978    5.009991
   _Ifirm_16 |   3.254324   1.895394     1.72   0.088    -.4952173    7.003865
   _Ifirm_17 |   9.228984   2.437615     3.79   0.000       4.4068    14.05117
   _Ifirm_18 |  -.4320458   1.895803    -0.23   0.820    -4.182396    3.318304
   _Ifirm_19 |   3.572685    5.22438     0.68   0.495    -6.762384    13.90775
   _Ifirm_20 |  -.8113158   1.895284    -0.43   0.669    -4.560639    2.938008
   _Ifirm_21 |   7.945966   2.431426     3.27   0.001     3.136025    12.75591
   _Ifirm_22 |   28.43215   5.360518     5.30   0.000     17.82777    39.03653
   _Ifirm_23 |   4.654646   2.053165     2.27   0.025      .592996    8.716296
   _Ifirm_24 |   5.566832   1.899399     2.93   0.004     1.809368    9.324297
   _Ifirm_25 |   6.125127   1.994624     3.07   0.003     2.179285    10.07097
   _Ifirm_26 |   19.42043   2.496877     7.78   0.000     14.48101    24.35985
   _Ifirm_27 |   4.157707   1.952369     2.13   0.035     .2954543    8.019959
   _Ifirm_28 |   10.39055   2.254762     4.61   0.000     5.930094    14.85101
   _Ifirm_29 |   49.72418   7.902525     6.29   0.000      34.0911    65.35726
   _Ifirm_30 |   7.186921   2.070225     3.47   0.001     3.091521    11.28232
   _Ifirm_31 |   10.16705   2.682541     3.79   0.000     4.860346    15.47376
   _Ifirm_32 |   1.092403   1.914582     0.57   0.569    -2.695097    4.879903
   _Ifirm_33 |   5.459069   1.951981     2.80   0.006     1.597585    9.320553
       _cons |   .7835136   1.379906     0.57   0.571     -1.94627    3.513297
------------------------------------------------------------------------------

. vif
```

```
    Variable |       VIF       1/VIF  
-------------+----------------------
       curra |     70.92    0.014099
   _Ifirm_29 |     33.73    0.029651
   _Ifirm_12 |     24.93    0.040113
   _Ifirm_22 |     15.52    0.064440
   _Ifirm_19 |     14.74    0.067842
    _Ifirm_2 |      8.61    0.116196
   _Ifirm_13 |      7.60    0.131543
   _Ifirm_31 |      3.89    0.257322
    _Ifirm_6 |      3.84    0.260343
   _Ifirm_26 |      3.37    0.297013
   _Ifirm_17 |      3.21    0.311630
   _Ifirm_21 |      3.19    0.313219
   _Ifirm_28 |      2.75    0.364224
    _Ifirm_7 |      2.53    0.395498
   _Ifirm_10 |      2.34    0.427983
   _Ifirm_30 |      2.31    0.432051
   _Ifirm_23 |      2.28    0.439261
    _Ifirm_5 |      2.23    0.448727
   _Ifirm_25 |      2.15    0.465423
   _Ifirm_27 |      2.06    0.485787
   _Ifirm_33 |      2.06    0.485981
    _Ifirm_9 |      2.04    0.489551
   _Ifirm_14 |      2.04    0.491345
   _Ifirm_32 |      1.98    0.505152
    _Ifirm_4 |      1.96    0.509991
    _Ifirm_3 |      1.96    0.510862
    _Ifirm_8 |      1.95    0.512116
   _Ifirm_24 |      1.95    0.513260
   _Ifirm_15 |      1.94    0.515172
   _Ifirm_18 |      1.94    0.515209
   _Ifirm_11 |      1.94    0.515285
   _Ifirm_16 |      1.94    0.515432
   _Ifirm_20 |      1.94    0.515492
-------------+----------------------
    Mean VIF |      7.21

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   201.04
         Prob > chi2  =   0.0000

. xtgls env curra i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3395.60
Log likelihood             = -396.1566          Prob > chi2        =    0.0000
```

```
------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0074464   .0049628     1.50   0.134    -.0022806    .0171734
             |
        firm |
          2  |   7.515085   3.556996     2.11   0.035     .5435017    14.48667
          3  |   11.31864   1.696395     6.67   0.000     7.993766    14.64351
          4  |   4.301312   1.697843     2.53   0.011     .9736021    7.629023
          5  |    3.67377   1.810038     2.03   0.042     .1261617    7.221379
          6  |   8.663823   2.376323     3.65   0.000     4.006315    13.32133
          7  |   9.677714   1.927999     5.02   0.000     5.898905    13.45652
          8  |  -.1752688   1.694317    -0.10   0.918    -3.496069    3.145532
          9  |   3.060304   1.732925     1.77   0.077    -.3361656    6.456774
         10  |   2.134714   1.853385     1.15   0.249    -1.497853    5.767281
         11  |   3.125289   1.689099     1.85   0.064     -.185284    6.435862
         12  |   21.20825   6.053912     3.50   0.000     9.342801     33.0737
         13  |   19.06684   3.343065     5.70   0.000     12.51456    25.61913
         14  |   1.239207   1.729759     0.72   0.474    -2.151058    4.629471
         15  |   1.259506   1.689283     0.75   0.456    -2.051427     4.57044
         16  |   3.254324   1.688858     1.93   0.054     -.055777    6.564425
         17  |   9.228984   2.171995     4.25   0.000     4.971952    13.48602
         18  |  -.4320458   1.689222    -0.26   0.798    -3.742861    2.878769
         19  |   3.572685   4.655094     0.77   0.443     -5.55113     12.6965
         20  |  -.8113158    1.68876    -0.48   0.631    -4.121224    2.498593
         21  |   7.945966    2.16648     3.67   0.000     3.699743    12.19219
         22  |   28.43215   4.776397     5.95   0.000     19.07059    37.79372
         23  |   4.654646   1.829437     2.54   0.011     1.069015    8.240278
         24  |   5.566832   1.692427     3.29   0.001     2.249737    8.883928
         25  |   6.125127   1.777275     3.45   0.001     2.641732    9.608523
         26  |   19.42043   2.224799     8.73   0.000      15.0599    23.78095
         27  |   4.157707   1.739625     2.39   0.017     .7481042    7.567309
         28  |   10.39055   2.009067     5.17   0.000     6.452853    14.32825
         29  |   49.72418   7.041409     7.06   0.000     35.92328    63.52509
         30  |   7.186921   1.844639     3.90   0.000     3.571496    10.80235
         31  |   10.16705   2.390232     4.25   0.000     5.482284    14.85182
         32  |   1.092403   1.705955     0.64   0.522    -2.251208    4.436014
         33  |   5.459069   1.739279     3.14   0.002     2.050145    8.867993
             |
       _cons |   .7835136   1.229541     0.64   0.524    -1.626343    3.193371
------------------------------------------------------------------------------

. xi: reg env asset i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   82.10
       Model |  24209.1748    33  733.611359           Prob > F      =  0.0000
    Residual |  1170.53679   131  8.93539532           R-squared     =  0.9539
-------------+------------------------------           Adj R-squared =  0.9423
       Total |  25379.7116   164  154.754339           Root MSE      =  2.9892

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0038095   .0024491     1.56   0.122    -.0010355    .0086544
    _Ifirm_2 |   7.207017   3.732221     1.93   0.056     -.176207    14.59024
    _Ifirm_3 |    11.1913   1.892048     5.91   0.000     7.448382    14.93423
    _Ifirm_4 |   4.011647   1.924035     2.09   0.039     .2054474    7.817846
```

```
    _Ifirm_5 |   3.142764   2.124999     1.48   0.142    -1.060991    7.346519
    _Ifirm_6 |   8.134188   2.718442     2.99   0.003     2.756462    13.51191
    _Ifirm_7 |   9.739296   2.076166     4.69   0.000     5.632145    13.84645
    _Ifirm_8 |  -.2227783   1.893419    -0.12   0.907    -3.968413    3.522856
    _Ifirm_9 |   2.943902   1.943533     1.51   0.132    -.9008703    6.788675
   _Ifirm_10 |   1.745829   2.132723     0.82   0.415    -2.473206    5.964865
   _Ifirm_11 |   2.812803   1.906066     1.48   0.142    -.9578511    6.583457
   _Ifirm_12 |   20.12764   6.580154     3.06   0.003     7.110528    33.14476
   _Ifirm_13 |   18.60868   3.612041     5.15   0.000      11.4632    25.75416
   _Ifirm_14 |   1.108598   1.942451     0.57   0.569    -2.734033    4.951229
   _Ifirm_15 |   .9934978   1.903221     0.52   0.603    -2.771526    4.758522
   _Ifirm_16 |   3.099872   1.895067     1.64   0.104    -.6490234    6.848766
   _Ifirm_17 |   8.555656   2.576656     3.32   0.001     3.458416     13.6529
   _Ifirm_18 |    -.47364   1.890645    -0.25   0.803    -4.213787    3.266507
   _Ifirm_19 |    3.63293   4.556567     0.80   0.427    -5.381046    12.64691
   _Ifirm_20 |  -.7983186   1.890629    -0.42   0.674    -4.538433    2.941796
   _Ifirm_21 |   6.575146   2.893637     2.27   0.025     .8508422    12.29945
   _Ifirm_22 |   26.88563   5.631024     4.77   0.000     15.74612    38.02514
   _Ifirm_23 |   3.975183   2.195341     1.81   0.072    -.3677261    8.318091
   _Ifirm_24 |   5.398762   1.903142     2.84   0.005     1.633894    9.163631
   _Ifirm_25 |   5.787909   2.034519     2.84   0.005     1.763144    9.812674
   _Ifirm_26 |   19.07553   2.489123     7.66   0.000     14.15145    23.99961
   _Ifirm_27 |   4.027526   1.952354     2.06   0.041     .1653053    7.889747
   _Ifirm_28 |    9.71616    2.40324     4.04   0.000     4.961978    14.47034
   _Ifirm_29 |   48.63096   7.537885     6.45   0.000     33.71923     63.5427
   _Ifirm_30 |   6.941712   2.082802     3.33   0.001     2.821434    11.06199
   _Ifirm_31 |   8.555755   3.269768     2.62   0.010     2.087375    15.02414
   _Ifirm_32 |   1.010429   1.912239     0.53   0.598    -2.772436    4.793295
   _Ifirm_33 |   5.214706   1.971565     2.64   0.009      1.31448    9.114932
       _cons |   .8888414   1.354071     0.66   0.513    -1.789834    3.567517
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
       asset |     64.35    0.015541
   _Ifirm_29 |     30.83    0.032435
   _Ifirm_12 |     23.49    0.042563
   _Ifirm_22 |     17.21    0.058121
   _Ifirm_19 |     11.27    0.088763
    _Ifirm_2 |      7.56    0.132304
   _Ifirm_13 |      7.08    0.141254
   _Ifirm_31 |      5.80    0.172375
   _Ifirm_21 |      4.54    0.220100
    _Ifirm_6 |      4.01    0.249383
   _Ifirm_17 |      3.60    0.277584
   _Ifirm_26 |      3.36    0.297451
   _Ifirm_28 |      3.13    0.319090
   _Ifirm_23 |      2.62    0.382387
   _Ifirm_10 |      2.47    0.405171
    _Ifirm_5 |      2.45    0.408122
   _Ifirm_30 |      2.35    0.424827
    _Ifirm_7 |      2.34    0.427547
   _Ifirm_25 |      2.25    0.445230
   _Ifirm_33 |      2.11    0.474117
   _Ifirm_27 |      2.07    0.483494
    _Ifirm_9 |      2.05    0.487892
   _Ifirm_14 |      2.05    0.488436
    _Ifirm_4 |      2.01    0.497831
```

```
   _Ifirm_32 |      1.98    0.503992
   _Ifirm_11 |      1.97    0.507261
   _Ifirm_15 |      1.97    0.508779
   _Ifirm_24 |      1.97    0.508821
   _Ifirm_16 |      1.95    0.513167
    _Ifirm_8 |      1.95    0.514061
    _Ifirm_3 |      1.94    0.514806
   _Ifirm_18 |      1.94    0.515570
   _Ifirm_20 |      1.94    0.515579
-------------+----------------------
    Mean VIF |      6.93

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   189.72
         Prob > chi2  =   0.0000

. xtgls env asset i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3412.55
Log likelihood             = -395.7648          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0038095   .0021822     1.75   0.081    -.0004676    .0080866
             |
        firm |
          2  |   7.207017   3.325531     2.17   0.030      .689095    13.72494
          3  |    11.1913   1.685877     6.64   0.000     7.887046    14.49556
          4  |   4.011647   1.714378     2.34   0.019     .6515279    7.371766
          5  |   3.142764   1.893444     1.66   0.097     -.568318    6.853845
          6  |   8.134188   2.422221     3.36   0.001     3.386723    12.88165
          7  |   9.739296   1.849932     5.26   0.000     6.113496     13.3651
          8  |  -.2227783   1.687098    -0.13   0.895     -3.52943    3.083874
          9  |   2.943902   1.731752     1.70   0.089    -.4502691    6.338073
         10  |   1.745829   1.900326     0.92   0.358    -1.978742      5.4704
         11  |   2.812803   1.698368     1.66   0.098    -.5159364    6.141543
         12  |   20.12764   5.863133     3.43   0.001     8.636114    31.61917
         13  |   18.60868   3.218447     5.78   0.000     12.30064    24.91672
         14  |   1.108598   1.730787     0.64   0.522    -2.283683    4.500879
         15  |   .9934978   1.695832     0.59   0.558    -2.330272    4.317267
         16  |   3.099872   1.688567     1.84   0.066    -.2096589    6.409402
         17  |   8.555656   2.295885     3.73   0.000     4.055804    13.05551
         18  |    -.47364   1.684627    -0.28   0.779    -3.775448    2.828168
         19  |    3.63293    4.06005     0.89   0.371    -4.324622    11.59048
         20  |  -.7983186   1.684612    -0.47   0.636    -4.100098     2.50346
```

```
          21 |   6.575146   2.578325     2.55   0.011     1.521721    11.62857
          22 |   26.88563   5.017427     5.36   0.000     17.05165     36.7196
          23 |   3.975183   1.956121     2.03   0.042     .1412558    7.809109
          24 |   5.398762   1.695762     3.18   0.001      2.07513    8.722394
          25 |   5.787909   1.812823     3.19   0.001      2.23484    9.340978
          26 |   19.07553    2.21789     8.60   0.000     14.72854    23.42251
          27 |   4.027526   1.739611     2.32   0.021     .6179515    7.437101
          28 |    9.71616   2.141366     4.54   0.000      5.51916    13.91316
          29 |   48.63096   6.716503     7.24   0.000     35.46686    61.79507
          30 |   6.941712   1.855845     3.74   0.000     3.304324     10.5791
          31 |   8.555755    2.91347     2.94   0.003     2.845459    14.26605
          32 |   1.010429   1.703868     0.59   0.553     -2.32909    4.349949
          33 |   5.214706   1.756729     2.97   0.003     1.771581    8.657832
             |
       _cons |   .8888414   1.206522     0.74   0.461    -1.475897     3.25358
------------------------------------------------------------------------------

. xi: reg env currl i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   82.69
       Model |  24217.0783    33  733.850856           Prob > F      =  0.0000
    Residual |  1162.63336   131  8.87506382           R-squared     =  0.9542
-------------+------------------------------           Adj R-squared =  0.9427
       Total |  25379.7116   164  154.754339           Root MSE      =  2.9791

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0105533   .0057863     1.82   0.070    -.0008934    .0219999
    _Ifirm_2 |   7.414056   3.235998     2.29   0.024      1.01248    13.81563
    _Ifirm_3 |   11.17721   1.885001     5.93   0.000      7.44823    14.90619
    _Ifirm_4 |   4.039791   1.906246     2.12   0.036     .2687813    7.810801
    _Ifirm_5 |   3.403622   2.004629     1.70   0.092    -.5620111    7.369256
    _Ifirm_6 |   7.446687    2.77911     2.68   0.008     1.948945    12.94443
    _Ifirm_7 |   9.870216   1.996412     4.94   0.000     5.920837     13.8196
    _Ifirm_8 |  -.3943776   1.884158    -0.21   0.835    -4.121692    3.332937
    _Ifirm_9 |   3.080928   1.909366     1.61   0.109    -.6962533    6.858109
   _Ifirm_10 |   2.643287    1.91634     1.38   0.170    -1.147692    6.434265
   _Ifirm_11 |   2.828628   1.894564     1.49   0.138    -.9192711    6.576526
   _Ifirm_12 |   19.32807   6.111332     3.16   0.002     7.238395    31.41774
   _Ifirm_13 |    18.5544   3.255308     5.70   0.000     12.11463    24.99418
   _Ifirm_14 |   .9430833   1.942168     0.49   0.628    -2.898988    4.785154
   _Ifirm_15 |   1.007128   1.892687     0.53   0.596    -2.737059    4.751314
   _Ifirm_16 |   3.140861   1.886258     1.67   0.098    -.5906068    6.872328
   _Ifirm_17 |   8.343424   2.477974     3.37   0.001     3.441401    13.24545
   _Ifirm_18 |  -.5587947   1.884391    -0.30   0.767    -4.286569     3.16898
   _Ifirm_19 |   6.924514   2.558598     2.71   0.008     1.862996    11.98603
   _Ifirm_20 |  -.8379002   1.884513    -0.44   0.657    -4.565916    2.890116
   _Ifirm_21 |   6.289189   2.766036     2.27   0.025     .8173094    11.76107
   _Ifirm_22 |   27.51815   4.582124     6.01   0.000     18.45362    36.58269
   _Ifirm_23 |   4.266883   2.043765     2.09   0.039     .2238284    8.309937
   _Ifirm_24 |   5.480471   1.889468     2.90   0.004     1.742653    9.218288
   _Ifirm_25 |    6.11792   1.939532     3.15   0.002     2.281063    9.954776
   _Ifirm_26 |   18.23823   2.633521     6.93   0.000      13.0285    23.44796
   _Ifirm_27 |   4.072539   1.924287     2.12   0.036     .2658402    7.879238
   _Ifirm_28 |   9.209161   2.435567     3.78   0.000     4.391029    14.02729
   _Ifirm_29 |   52.91582   4.307705    12.28   0.000     44.39415    61.43749
   _Ifirm_30 |   7.214049   1.976192     3.65   0.000     3.304669    11.12343
```

```
   _Ifirm_31 |   9.511846   2.572168     3.70   0.000     4.423484    14.60021
   _Ifirm_32 |   1.243562   1.887789     0.66   0.511    -2.490935    4.978058
   _Ifirm_33 |   5.319886   1.930264     2.76   0.007     1.501364    9.138409
       _cons |    1.00014   1.337938     0.75   0.456    -1.646621      3.6469
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
       currl |     36.24    0.027592
   _Ifirm_12 |     20.40    0.049011
   _Ifirm_22 |     11.47    0.087183
   _Ifirm_29 |     10.14    0.098645
   _Ifirm_13 |      5.79    0.172735
    _Ifirm_2 |      5.72    0.174803
    _Ifirm_6 |      4.22    0.237003
   _Ifirm_21 |      4.18    0.239249
   _Ifirm_26 |      3.79    0.263932
   _Ifirm_31 |      3.61    0.276673
   _Ifirm_19 |      3.58    0.279615
   _Ifirm_17 |      3.35    0.298107
   _Ifirm_28 |      3.24    0.308578
   _Ifirm_23 |      2.28    0.438232
    _Ifirm_5 |      2.20    0.455510
    _Ifirm_7 |      2.18    0.459267
   _Ifirm_30 |      2.13    0.468713
   _Ifirm_14 |      2.06    0.485280
   _Ifirm_25 |      2.06    0.486599
   _Ifirm_33 |      2.04    0.491283
   _Ifirm_27 |      2.02    0.494340
   _Ifirm_10 |      2.01    0.498448
    _Ifirm_9 |      1.99    0.502096
    _Ifirm_4 |      1.99    0.503741
   _Ifirm_11 |      1.96    0.509973
   _Ifirm_15 |      1.96    0.510985
   _Ifirm_24 |      1.95    0.512727
   _Ifirm_32 |      1.95    0.513640
   _Ifirm_16 |      1.94    0.514474
    _Ifirm_3 |      1.94    0.515160
   _Ifirm_20 |      1.94    0.515427
   _Ifirm_18 |      1.94    0.515494
    _Ifirm_8 |      1.94    0.515621
-------------+----------------------
    Mean VIF |      4.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   172.86
         Prob > chi2  =   0.0000

. xtgls env currl i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
```

```
Panels:         homoskedastic
Correlation:    no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3436.87
Log likelihood             = -395.2059          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0105533   .0051558     2.05   0.041     .0004481    .0206584
             |
        firm |
          2  |   7.414056    2.88338     2.57   0.010     1.762735    13.06538
          3  |   11.17721   1.679597     6.65   0.000      7.88526    14.46916
          4  |   4.039791   1.698528     2.38   0.017     .7107376    7.368845
          5  |   3.403622    1.78619     1.91   0.057    -.0972452     6.90449
          6  |   7.446687   2.476278     3.01   0.003     2.593272     12.3001
          7  |   9.870216   1.778869     5.55   0.000     6.383698    13.35673
          8  |  -.3943776   1.678847    -0.23   0.814    -3.684857    2.896101
          9  |   3.080928   1.701308     1.81   0.070    -.2535737    6.415429
         10  |   2.643287   1.707522     1.55   0.122    -.7033951    5.989968
         11  |   2.828628   1.688118     1.68   0.094    -.4800233    6.137279
         12  |   19.32807   5.445397     3.55   0.000     8.655285    30.00085
         13  |    18.5544   2.900586     6.40   0.000     12.86936    24.23945
         14  |   .9430833   1.730535     0.54   0.586    -2.448703     4.33487
         15  |   1.007128   1.686446     0.60   0.550    -2.298246    4.312502
         16  |   3.140861   1.680717     1.87   0.062    -.1532847    6.435006
         17  |   8.343424   2.207956     3.78   0.000      4.01591    12.67094
         18  |  -.5587947   1.679054    -0.33   0.739     -3.84968     2.73209
         19  |   6.924514   2.279795     3.04   0.002     2.456198    11.39283
         20  |  -.8379002   1.679163    -0.50   0.618    -4.128999    2.453198
         21  |   6.289189   2.464629     2.55   0.011     1.458605    11.11977
         22  |   27.51815   4.082822     6.74   0.000     19.51597    35.52034
         23  |   4.266883   1.821061     2.34   0.019      .697668    7.836097
         24  |   5.480471   1.683577     3.26   0.001      2.18072    8.780222
         25  |    6.11792   1.728187     3.54   0.000     2.730736    9.505103
         26  |   18.23823   2.346553     7.77   0.000     13.63907    22.83739
         27  |   4.072539   1.714603     2.38   0.018     .7119792    7.433099
         28  |   9.209161    2.17017     4.24   0.000     4.955707    13.46262
         29  |   52.91582   3.838306    13.79   0.000     45.39288    60.43876
         30  |   7.214049   1.760852     4.10   0.000     3.762843    10.66526
         31  |   9.511846   2.291886     4.15   0.000     5.019832    14.00386
         32  |   1.243562   1.682082     0.74   0.460    -2.053258    4.540381
         33  |   5.319886   1.719929     3.09   0.002     1.948888    8.690885
             |
       _cons |    1.00014   1.192147     0.84   0.402    -1.336425    3.336704
------------------------------------------------------------------------------

. xi: reg env ltd i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   80.81
       Model |    24191.35    33  733.071211           Prob > F      =  0.0000
    Residual |  1188.36166   131  9.07146308           R-squared     =  0.9532
-------------+------------------------------           Adj R-squared =  0.9414
       Total |  25379.7116   164  154.754339           Root MSE      =  3.0119
```

env	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ltd	.0034697	.0053654	0.65	0.519	-.0071444	.0140838
_Ifirm_2	11.75285	2.033123	5.78	0.000	7.730845	15.77485
_Ifirm_3	11.07424	1.904885	5.81	0.000	7.30592	14.84255
_Ifirm_4	4.495327	1.90816	2.36	0.020	.7205309	8.270123
_Ifirm_5	4.359773	1.957751	2.23	0.028	.4868741	8.232672
_Ifirm_6	10.23571	2.393232	4.28	0.000	5.501321	14.97009
_Ifirm_7	11.02242	1.906554	5.78	0.000	7.250804	14.79404
_Ifirm_8	-.398037	1.904991	-0.21	0.835	-4.166564	3.37049
_Ifirm_9	3.637422	1.904921	1.91	0.058	-.1309652	7.40581
_Ifirm_10	3.168719	1.912809	1.66	0.100	-.6152741	6.952712
_Ifirm_11	3.120068	1.907987	1.64	0.104	-.6543851	6.894521
_Ifirm_12	27.97622	3.573214	7.83	0.000	20.90755	35.04489
_Ifirm_13	22.36058	2.488422	8.99	0.000	17.43788	27.28327
_Ifirm_14	1.726836	1.908465	0.90	0.367	-2.048563	5.502236
_Ifirm_15	1.291456	1.906053	0.68	0.499	-2.479171	5.062082
_Ifirm_16	3.265517	1.905785	1.71	0.089	-.5045811	7.035614
_Ifirm_17	11.05992	1.934721	5.72	0.000	7.232579	14.88726
_Ifirm_18	-.5036669	1.904885	-0.26	0.792	-4.271983	3.264649
_Ifirm_19	9.998327	1.909232	5.24	0.000	6.221411	13.77524
_Ifirm_20	-.7744458	1.904894	-0.41	0.685	-4.542781	2.993889
_Ifirm_21	9.187023	2.267623	4.05	0.000	4.701124	13.67292
_Ifirm_22	33.58418	3.063836	10.96	0.000	27.52318	39.64518
_Ifirm_23	5.246215	2.035965	2.58	0.011	1.21859	9.273841
_Ifirm_24	5.710433	1.90539	3.00	0.003	1.941118	9.479748
_Ifirm_25	6.756008	1.930124	3.50	0.001	2.937762	10.57425
_Ifirm_26	20.99526	2.117974	9.91	0.000	16.8054	25.18512
_Ifirm_27	4.649026	1.916556	2.43	0.017	.8576198	8.440431
_Ifirm_28	11.41738	2.123332	5.38	0.000	7.216923	15.61784
_Ifirm_29	59.29289	2.181936	27.17	0.000	54.9765	63.60928
_Ifirm_30	8.192916	1.91223	4.28	0.000	4.410069	11.97576
_Ifirm_31	11.88204	2.291216	5.19	0.000	7.349469	16.41461
_Ifirm_32	1.417354	1.905881	0.74	0.458	-2.352933	5.187641
_Ifirm_33	5.934027	1.9191	3.09	0.002	2.13759	9.730465
_cons	1.223199	1.346957	0.91	0.365	-1.441404	3.887801

. vif

Variable	VIF	1/VIF
ltd	10.58	0.094532
_Ifirm_12	6.82	0.146539
_Ifirm_22	5.02	0.199315
_Ifirm_13	3.31	0.302150
_Ifirm_6	3.06	0.326664
_Ifirm_31	2.81	0.356401
_Ifirm_21	2.75	0.363856
_Ifirm_29	2.54	0.392995
_Ifirm_28	2.41	0.414988
_Ifirm_26	2.40	0.417090
_Ifirm_23	2.22	0.451368
_Ifirm_2	2.21	0.452631
_Ifirm_5	2.05	0.488153
_Ifirm_17	2.00	0.499844
_Ifirm_25	1.99	0.502228
_Ifirm_33	1.97	0.508015

```
   _Ifirm_27 |      1.96    0.509364
   _Ifirm_10 |      1.96    0.511361
   _Ifirm_30 |      1.95    0.511671
   _Ifirm_19 |      1.95    0.513279
   _Ifirm_14 |      1.95    0.513692
    _Ifirm_4 |      1.95    0.513856
   _Ifirm_11 |      1.95    0.513950
    _Ifirm_7 |      1.94    0.514723
   _Ifirm_15 |      1.94    0.514993
   _Ifirm_32 |      1.94    0.515086
   _Ifirm_16 |      1.94    0.515138
   _Ifirm_24 |      1.94    0.515352
    _Ifirm_8 |      1.94    0.515567
    _Ifirm_9 |      1.94    0.515605
   _Ifirm_20 |      1.94    0.515620
   _Ifirm_18 |      1.94    0.515625
    _Ifirm_3 |      1.94    0.515625
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   221.23
         Prob > chi2  =   0.0000

. xtgls env ltd i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3358.89
Log likelihood             = -397.0117          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |   .0034697   .0047808     0.73   0.468    -.0059004    .0128398
             |
        firm |
          2  |   11.75285   1.811579     6.49   0.000     8.202217    15.30348
          3  |   11.07424   1.697315     6.52   0.000     7.747561    14.40091
          4  |   4.495327   1.700233     2.64   0.008     1.162931    7.827723
          5  |   4.359773   1.744421     2.50   0.012     .9407717    7.778774
          6  |   10.23571   2.132448     4.80   0.000     6.056183    14.41523
          7  |   11.02242   1.698802     6.49   0.000     7.692831    14.35201
          8  |   -.398037    1.69741    -0.23   0.815    -3.724899    2.928825
          9  |   3.637422   1.697347     2.14   0.032     .3106838    6.964161
         10  |   3.168719   1.704376     1.86   0.063    -.1717961    6.509234
         11  |   3.120068   1.700079     1.84   0.066    -.2120252    6.452161
         12  |   27.97622    3.18385     8.79   0.000     21.73598    34.21645
```

```
          13 |   22.36058   2.217266    10.08   0.000     18.01482    26.70634
          14 |   1.726836   1.700505     1.02   0.310    -1.606092    5.059765
          15 |   1.291456   1.698355     0.76   0.447    -2.037259    4.620171
          16 |   3.265517   1.698117     1.92   0.054    -.0627316    6.593765
          17 |   11.05992     1.7239     6.42   0.000     7.681137     14.4387
          18 |  -.5036669   1.697315    -0.30   0.767    -3.830342    2.823009
          19 |   9.998327   1.701188     5.88   0.000     6.664059     13.3326
          20 |  -.7744458   1.697323    -0.46   0.648    -4.101138    2.552246
          21 |   9.187023   2.020526     4.55   0.000     5.226864    13.14718
          22 |   33.58418   2.729978    12.30   0.000     28.23352    38.93484
          23 |   5.246215   1.814112     2.89   0.004     1.690621    8.801809
          24 |   5.710433   1.697765     3.36   0.001     2.382876    9.037991
          25 |   6.756008   1.719804     3.93   0.000     3.385254    10.12676
          26 |   20.99526   1.887185    11.13   0.000     17.29645    24.69408
          27 |   4.649026   1.707715     2.72   0.006     1.301967    7.996084
          28 |   11.41738   1.891958     6.03   0.000      7.70921    15.12555
          29 |   59.29289   1.944177    30.50   0.000     55.48237     63.1034
          30 |   8.192916    1.70386     4.81   0.000     4.853412    11.53242
          31 |   11.88204   2.041548     5.82   0.000     7.880679     15.8834
          32 |   1.417354   1.698202     0.83   0.404    -1.911061    4.745769
          33 |   5.934027   1.709981     3.47   0.001     2.582527    9.285528
             |
       _cons |   1.223199   1.200183     1.02   0.308    -1.129117    3.575514
------------------------------------------------------------------------------

. xi: reg env liab i.firm
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   81.07
       Model |  24194.9757    33  733.181082           Prob > F      =  0.0000
    Residual |   1184.7359   131  9.04378553           R-squared     =  0.9533
-------------+------------------------------           Adj R-squared =  0.9416
       Total |  25379.7116   164  154.754339           Root MSE      =  3.0073

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0030276   .0033426     0.91   0.367    -.0035849      .00964
    _Ifirm_2 |   9.965373   3.126039     3.19   0.002     3.781323    16.14942
    _Ifirm_3 |   11.09927   1.902181     5.84   0.000     7.336299    14.86223
    _Ifirm_4 |   4.291743   1.926207     2.23   0.028     .4812462    8.102239
    _Ifirm_5 |   3.951971   2.053009     1.92   0.056    -.1093698    8.013313
    _Ifirm_6 |   9.121274   2.957491     3.08   0.002     3.270652     14.9719
    _Ifirm_7 |   10.62023   1.966852     5.40   0.000     6.729325    14.51113
    _Ifirm_8 |  -.4074366   1.902138    -0.21   0.831    -4.170319    3.355446
    _Ifirm_9 |   3.412777   1.919179     1.78   0.078    -.3838174    7.209371
   _Ifirm_10 |   2.897552    1.94857     1.49   0.139    -.9571844    6.752288
   _Ifirm_11 |   2.998865   1.913696     1.57   0.120    -.7868822    6.784612
   _Ifirm_12 |   24.69904   6.081668     4.06   0.000     12.66805    36.73003
   _Ifirm_13 |     20.902    3.34655     6.25   0.000     14.28172    27.52227
   _Ifirm_14 |   1.443727   1.942763     0.74   0.459    -2.399521    5.286975
   _Ifirm_15 |   1.154396   1.912354     0.60   0.547    -2.628696    4.937488
   _Ifirm_16 |   3.204956   1.905079     1.68   0.095    -.5637453    6.973657
   _Ifirm_17 |   10.03849   2.343648     4.28   0.000     5.402199    14.67479
   _Ifirm_18 |  -.5284269   1.902168    -0.28   0.782    -4.291368    3.234514
   _Ifirm_19 |   8.957357   2.271159     3.94   0.000     4.464463    13.45025
   _Ifirm_20 |   -.794417   1.902159    -0.42   0.677    -4.557341    2.968507
   _Ifirm_21 |   7.925569   2.962318     2.68   0.008     2.065398    13.78574
   _Ifirm_22 |   31.15353   4.790624     6.50   0.000     21.67653    40.63052
```

```
   _Ifirm_23 |   4.760996   2.172009     2.19   0.030     .4642443    9.057747
   _Ifirm_24 |   5.626894   1.905985     2.95   0.004     1.856401    9.397387
   _Ifirm_25 |   6.448563   1.983146     3.25   0.001     2.525428     10.3717
   _Ifirm_26 |   20.01994   2.576366     7.77   0.000     14.92327     25.1166
   _Ifirm_27 |   4.448431   1.938063     2.30   0.023     .6144806    8.282382
   _Ifirm_28 |   10.58548   2.477887     4.27   0.000      5.68363    15.48733
   _Ifirm_29 |   56.80068   3.993302    14.22   0.000     48.90098    64.70038
   _Ifirm_30 |   7.817697   1.975468     3.96   0.000     3.909751    11.72564
   _Ifirm_31 |   10.91001   2.747127     3.97   0.000     5.475534    16.34448
   _Ifirm_32 |   1.293379   1.910557     0.68   0.500    -2.486158    5.072916
   _Ifirm_33 |   5.703934   1.947905     2.93   0.004     1.850514    9.557354
       _cons |   1.155112   1.347049     0.86   0.393    -1.509672    3.819897
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
        liab |     35.31    0.028320
   _Ifirm_12 |     19.83    0.050431
   _Ifirm_22 |     12.30    0.081276
   _Ifirm_29 |      8.55    0.116971
   _Ifirm_13 |      6.00    0.166552
    _Ifirm_2 |      5.24    0.190878
   _Ifirm_21 |      4.70    0.212560
    _Ifirm_6 |      4.69    0.213254
   _Ifirm_31 |      4.05    0.247165
   _Ifirm_26 |      3.56    0.281015
   _Ifirm_28 |      3.29    0.303796
   _Ifirm_17 |      2.94    0.339594
   _Ifirm_19 |      2.77    0.361617
   _Ifirm_23 |      2.53    0.395386
    _Ifirm_5 |      2.26    0.442550
   _Ifirm_25 |      2.11    0.474280
   _Ifirm_30 |      2.09    0.477974
    _Ifirm_7 |      2.07    0.482171
   _Ifirm_10 |      2.04    0.491261
   _Ifirm_33 |      2.03    0.491597
   _Ifirm_14 |      2.02    0.494202
   _Ifirm_27 |      2.01    0.496602
    _Ifirm_4 |      1.99    0.502734
    _Ifirm_9 |      1.97    0.506423
   _Ifirm_11 |      1.96    0.509329
   _Ifirm_15 |      1.96    0.510044
   _Ifirm_32 |      1.96    0.511004
   _Ifirm_24 |      1.95    0.513458
   _Ifirm_16 |      1.95    0.513947
    _Ifirm_3 |      1.94    0.515514
   _Ifirm_18 |      1.94    0.515521
   _Ifirm_20 |      1.94    0.515526
    _Ifirm_8 |      1.94    0.515538
-------------+----------------------
    Mean VIF |      4.66

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env
```

```
         chi2(1)       =   208.36
         Prob > chi2   =   0.0000

. xtgls env liab i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3369.67
Log likelihood             = -396.7596          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0030276   .0029784     1.02   0.309    -.0028099     .008865
             |
        firm |
          2  |   9.965373   2.785403     3.58   0.000     4.506084    15.42466
          3  |   11.09927   1.694906     6.55   0.000     7.777313    14.42122
          4  |   4.291743   1.716313     2.50   0.012     .9278303    7.655655
          5  |   3.951971   1.829298     2.16   0.031     .3666129     7.53733
          6  |   9.121274   2.635221     3.46   0.001     3.956335    14.28621
          7  |   10.62023    1.75253     6.06   0.000     7.185332    14.05512
          8  |  -.4074366   1.694867    -0.24   0.810    -3.729315    2.914442
          9  |   3.412777   1.710052     2.00   0.046     .0611374    6.764416
         10  |   2.897552    1.73624     1.67   0.095    -.5054154     6.30052
         11  |   2.998865   1.705166     1.76   0.079    -.3431987    6.340928
         12  |   24.69904   5.418965     4.56   0.000     14.07806    35.32002
         13  |     20.902   2.981886     7.01   0.000     15.05761    26.74639
         14  |   1.443727   1.731065     0.83   0.404    -1.949099    4.836552
         15  |   1.154396    1.70397     0.68   0.498    -2.185323    4.494116
         16  |   3.204956   1.697488     1.89   0.059    -.1220595    6.531972
         17  |   10.03849   2.088267     4.81   0.000     5.945566    14.13142
         18  |  -.5284269   1.694894    -0.31   0.755    -3.850357    2.793504
         19  |   8.957357   2.023677     4.43   0.000     4.991023    12.92369
         20  |   -.794417   1.694886    -0.47   0.639    -4.116332    2.527498
         21  |   7.925569   2.639522     3.00   0.003       2.7522    13.09894
         22  |   31.15353   4.268603     7.30   0.000     22.78722    39.51983
         23  |   4.760996   1.935331     2.46   0.014     .9678167    8.554174
         24  |   5.626894   1.698295     3.31   0.001     2.298297    8.955492
         25  |   6.448563   1.767048     3.65   0.000     2.985213    9.911914
         26  |   20.01994   2.295626     8.72   0.000     15.52059    24.51928
         27  |   4.448431   1.726877     2.58   0.010     1.063814    7.833049
         28  |   10.58548   2.207878     4.79   0.000     6.258119    14.91284
         29  |   56.80068   3.558163    15.96   0.000     49.82681    63.77455
         30  |   7.817697   1.760206     4.44   0.000     4.367756    11.26764
         31  |   10.91001    2.44778     4.46   0.000     6.112446    15.70757
         32  |   1.293379   1.702369     0.76   0.447    -2.043202    4.629961
         33  |   5.703934   1.735647     3.29   0.001     2.302129     9.10574
             |
       _cons |   1.155112   1.200265     0.96   0.336    -1.197364    3.507588
------------------------------------------------------------------------------

. xi: reg env oe i.firm
```

```
i.firm            _Ifirm_1-33         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     165
-------------+------------------------------           F( 33,   131) =   82.87
       Model |  24219.4694    33  733.923314           Prob > F      =  0.0000
    Residual |  1160.24227   131  8.85681121           R-squared     =  0.9543
-------------+------------------------------           Adj R-squared =  0.9428
       Total |  25379.7116   164  154.754339           Root MSE      =   2.976

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          oe |   .0098976   .0052142     1.90   0.060    -.0004173    .0202125
    _Ifirm_2 |   6.553548   3.525614     1.86   0.065    -.4209584    13.52805
    _Ifirm_3 |   11.29617   1.885848     5.99   0.000     7.565515    15.02683
    _Ifirm_4 |   4.024972   1.903797     2.11   0.036      .258808    7.791136
    _Ifirm_5 |   3.019282   2.069433     1.46   0.147    -1.074551    7.113115
    _Ifirm_6 |    9.98447   1.983557     5.03   0.000      6.06052    13.90842
    _Ifirm_7 |   9.089691    2.15302     4.22   0.000     4.830505    13.34888
    _Ifirm_8 |   .1098266   1.900179     0.06   0.954     -3.64918    3.868833
    _Ifirm_9 |   2.582615    1.96366     1.32   0.191    -1.301973    6.467204
   _Ifirm_10 |   .5462771   2.370357     0.23   0.818    -4.142855    5.235409
   _Ifirm_11 |   2.835506   1.891475     1.50   0.136     -.906284    6.577295
   _Ifirm_12 |   21.56485    4.79256     4.50   0.000     12.08403    31.04568
   _Ifirm_13 |   19.11112   2.939085     6.50   0.000     13.29691    24.92533
   _Ifirm_14 |   1.172358   1.911254     0.61   0.541    -2.608557    4.953274
   _Ifirm_15 |    1.03748    1.88871     0.55   0.584    -2.698839    4.773799
   _Ifirm_16 |   3.096431   1.885368     1.64   0.103    -.6332765    6.826139
   _Ifirm_17 |   8.258418    2.46466     3.35   0.001     3.382733     13.1341
   _Ifirm_18 |  -.3452643   1.884069    -0.18   0.855    -4.072403    3.381874
   _Ifirm_19 |  -2.997714   7.142782    -0.42   0.675    -17.12784    11.13241
   _Ifirm_20 |  -.7646742   1.882215    -0.41   0.685    -4.488145    2.958796
   _Ifirm_21 |   7.854293   2.190856     3.59   0.000     3.520258    12.18833
   _Ifirm_22 |   26.71963   4.816806     5.55   0.000     17.19084    36.24842
   _Ifirm_23 |   4.306804   2.022362     2.13   0.035     .3060888    8.307519
   _Ifirm_24 |   5.221167   1.901864     2.75   0.007     1.458827    8.983508
   _Ifirm_25 |   5.582019   2.016821     2.77   0.006     1.592266    9.571772
   _Ifirm_26 |    20.1965   2.021074     9.99   0.000     16.19834    24.19467
   _Ifirm_27 |   3.918269   1.936879     2.02   0.045     .0866609    7.749878
   _Ifirm_28 |   10.73064   2.001742     5.36   0.000     6.770718    14.69056
   _Ifirm_29 |   40.88884   10.23256     4.00   0.000     20.64639    61.13129
   _Ifirm_30 |   6.349692   2.144683     2.96   0.004     2.106997    10.59239
   _Ifirm_31 |   7.793425   3.199817     2.44   0.016     1.463424    14.12343
   _Ifirm_32 |   .8319785   1.910814     0.44   0.664    -2.948068    4.612025
   _Ifirm_33 |   5.069276   1.956767     2.59   0.011     1.198324    8.940229
       _cons |   .5784112   1.373693     0.42   0.674    -2.139081    3.295904
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
          oe |     88.00    0.011363
   _Ifirm_29 |     57.32    0.017446
   _Ifirm_19 |     27.93    0.035804
   _Ifirm_22 |     12.70    0.078732
   _Ifirm_12 |     12.57    0.079531
    _Ifirm_2 |      6.80    0.146961
   _Ifirm_31 |      5.61    0.178411
   _Ifirm_13 |      4.73    0.211469
```

```
   _Ifirm_17 |      3.33    0.300717
   _Ifirm_10 |      3.08    0.325120
   _Ifirm_21 |      2.63    0.380578
    _Ifirm_7 |      2.54    0.394072
   _Ifirm_30 |      2.52    0.397141
    _Ifirm_5 |      2.34    0.426548
   _Ifirm_23 |      2.24    0.446636
   _Ifirm_26 |      2.24    0.447205
   _Ifirm_25 |      2.23    0.449093
   _Ifirm_28 |      2.19    0.455885
    _Ifirm_6 |      2.15    0.464282
    _Ifirm_9 |      2.11    0.473738
   _Ifirm_33 |      2.10    0.477082
   _Ifirm_27 |      2.05    0.486930
   _Ifirm_14 |      2.00    0.500074
   _Ifirm_32 |      2.00    0.500304
    _Ifirm_4 |      1.98    0.504000
   _Ifirm_24 |      1.98    0.505024
    _Ifirm_8 |      1.98    0.505921
   _Ifirm_11 |      1.96    0.510587
   _Ifirm_15 |      1.95    0.512084
    _Ifirm_3 |      1.95    0.513639
   _Ifirm_16 |      1.95    0.513900
   _Ifirm_18 |      1.94    0.514609
   _Ifirm_20 |      1.94    0.515624
-------------+----------------------
    Mean VIF |      8.21

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   182.38
         Prob > chi2  =   0.0000

. xtgls env oe i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       165
Estimated autocorrelations =         0          Number of groups   =        33
Estimated coefficients     =        34          Time periods       =         5
                                                Wald chi2(33)      =   3444.29
Log likelihood             =  -395.036          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          oe |   .0098976    .004646     2.13   0.033     .0007916    .0190036
             |
        firm |
          2  |   6.553548   3.141438     2.09   0.037     .3964426    12.71065
          3  |   11.29617   1.680353     6.72   0.000     8.002743     14.5896
          4  |   4.024972   1.696345     2.37   0.018     .7001964    7.349748
```

```
           5  |   3.019282   1.843933     1.64   0.102    -.5947606    6.633324
           6  |    9.98447   1.767415     5.65   0.000     6.520401    13.44854
           7  |   9.089691   1.918411     4.74   0.000     5.329675    12.84971
           8  |   .1098266   1.693121     0.06   0.948     -3.20863    3.428284
           9  |   2.582615   1.749686     1.48   0.140    -.8467057    6.011936
          10  |   .5462771   2.112066     0.26   0.796    -3.593296     4.68585
          11  |   2.835506   1.685367     1.68   0.092    -.4677522    6.138763
          12  |   21.56485   4.270328     5.05   0.000     13.19517    29.93454
          13  |   19.11112   2.618821     7.30   0.000     13.97833    24.24392
          14  |   1.172358    1.70299     0.69   0.491     -2.16544    4.510157
          15  |    1.03748   1.682902     0.62   0.538    -2.260948    4.335908
          16  |   3.096431   1.679925     1.84   0.065    -.1961607    6.389023
          17  |   8.258418   2.196093     3.76   0.000     3.954156    12.56268
          18  |  -.3452643   1.678768    -0.21   0.837    -3.635588     2.94506
          19  |  -2.997714   6.364453    -0.47   0.638    -15.47181    9.476384
          20  |  -.7646742   1.677115    -0.46   0.648     -4.05176    2.522412
          21  |   7.854293   1.952124     4.02   0.000       4.0282    11.68039
          22  |   26.71963   4.291932     6.23   0.000      18.3076    35.13166
          23  |   4.306804   1.801991     2.39   0.017     .7749662    7.838641
          24  |   5.221167   1.694623     3.08   0.002     1.899767    8.542568
          25  |   5.582019   1.797054     3.11   0.002     2.059859     9.10418
          26  |    20.1965   1.800843    11.22   0.000     16.66692    23.72609
          27  |   3.918269   1.725823     2.27   0.023     .5357193    7.300819
          28  |   10.73064   1.783618     6.02   0.000     7.234815    14.22647
          29  |   40.88884   9.117548     4.48   0.000     23.01877    58.75891
          30  |   6.349692   1.910983     3.32   0.001     2.604234    10.09515
          31  |   7.793425   2.851142     2.73   0.006      2.20529    13.38156
          32  |   .8319785   1.702598     0.49   0.625    -2.505053     4.16901
          33  |   5.069276   1.743544     2.91   0.004     1.651994    8.486559
              |
        _cons |   .5784112   1.224005     0.47   0.637    -1.820596    2.977418
------------------------------------------------------------------------------

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/REVISED Environment
as Independent 2006-2010.log
  log type:  text
 closed on:   8 Jul 2012, 19:22:17
```

Appendix J: Environment as the Dependent Variable 2001-2008

```
------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Dependent 2001-2008.log
  log type:  text
 opened on:   8 Jul 2012, 20:07:45

. edit

. *(12 variables, 248 observations pasted into data editor)

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2008
                delta:  1 unit

. xi: reg revtot env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  148.11
       Model |  64698273.3    31  2087041.08           Prob > F      =  0.0000
    Residual |  3043721.88   216   14091.305           R-squared     =  0.9551
-------------+------------------------------           Adj R-squared =  0.9486
       Total |  67741995.2   247   274259.09           Root MSE      =  118.71

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   25.91354    2.87215     9.02   0.000     20.25251    31.57457
    _Ifirm_2 |   1042.251    65.8472    15.83   0.000     912.4654    1172.036
    _Ifirm_3 |    -324.35   66.53366    -4.87   0.000    -455.4883   -193.2117
    _Ifirm_4 |   2.890715   60.30137     0.05   0.962    -115.9637    121.7452
    _Ifirm_5 |   97.01108   61.03625     1.59   0.113    -23.29182     217.314
    _Ifirm_6 |   634.3098   66.80096     9.50   0.000     502.6446     765.975
    _Ifirm_7 |   201.7326   66.53366     3.03   0.003      70.5943     332.871
    _Ifirm_8 |  -30.82278   59.37309    -0.52   0.604    -147.8476    86.20203
    _Ifirm_9 |   26.45397   60.13606     0.44   0.660    -92.07464    144.9826
   _Ifirm_10 |   140.8553   60.84787     2.31   0.022     20.92371    260.7869
   _Ifirm_11 |  -4.274707   59.66833    -0.07   0.943    -121.8814     113.332
   _Ifirm_12 |   1372.867   99.85125    13.75   0.000      1176.06    1569.675
   _Ifirm_13 |   666.9838   82.74403     8.06   0.000     503.8947    830.0729
   _Ifirm_14 |   33.48866    60.1491     0.56   0.578    -85.06567     152.043
   _Ifirm_15 |   22.29164   59.45222     0.37   0.708    -94.88914    139.4724
   _Ifirm_16 |  -59.91076   59.84901    -1.00   0.318    -177.8736     58.0521
   _Ifirm_17 |   537.9884   65.40881     8.23   0.000     409.0671    666.9096
   _Ifirm_18 |  -19.16764   59.36006    -0.32   0.747    -136.1668    97.83148
   _Ifirm_19 |   706.5068   63.47757    11.13   0.000      581.392    831.6215
   _Ifirm_20 |   20.58012   59.40139     0.35   0.729    -96.50047    137.6607
   _Ifirm_21 |   611.9616   60.81953    10.06   0.000     492.0858    731.8373
   _Ifirm_22 |   574.0474   97.27981     5.90   0.000     382.3082    765.7867
   _Ifirm_23 |   136.5829   60.44736     2.26   0.025     17.44065    255.7251
   _Ifirm_24 |  -57.15799   60.70805    -0.94   0.347     -176.814    62.49802
   _Ifirm_25 |   2.058881   61.97768     0.03   0.974    -120.0996    124.2174
```

```
   _Ifirm_26 |   92.93898   74.07992     1.25   0.211    -53.07308    238.9511
   _Ifirm_27 |   27.03176   60.69931     0.45   0.657    -92.60703    146.6706
   _Ifirm_28 |   221.2114   66.30325     3.34   0.001     90.52722    351.8956
   _Ifirm_29 |   156.4642   62.48294     2.50   0.013     33.30983    279.6185
   _Ifirm_30 |   8.218528    59.4806     0.14   0.890    -109.0182    125.4552
   _Ifirm_31 |  -8.476102   60.97245    -0.14   0.890    -128.6533    111.7011
       _cons |   59.23699   42.09947     1.41   0.161    -23.74138    142.2154
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.24    0.121301
   _Ifirm_12 |      5.48    0.182555
   _Ifirm_22 |      5.20    0.192334
   _Ifirm_13 |      3.76    0.265845
   _Ifirm_26 |      3.02    0.331666
    _Ifirm_6 |      2.45    0.407884
    _Ifirm_3 |      2.43    0.411168
    _Ifirm_7 |      2.43    0.411168
   _Ifirm_28 |      2.42    0.414030
    _Ifirm_2 |      2.38    0.419785
   _Ifirm_17 |      2.35    0.425431
   _Ifirm_19 |      2.21    0.451711
   _Ifirm_29 |      2.14    0.466207
   _Ifirm_25 |      2.11    0.473839
    _Ifirm_5 |      2.05    0.488569
   _Ifirm_31 |      2.04    0.489592
   _Ifirm_10 |      2.03    0.491599
   _Ifirm_21 |      2.03    0.492057
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of revtot

         chi2(1)      =   400.30
         Prob > chi2  =   0.0000

. xtgls revtot env i. firm

Cross-sectional time-series FGLS regression
```

```
Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   5271.56
Log likelihood             = -1519.377          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   25.91354   2.680453     9.67   0.000     20.65995    31.16713
             |
        firm |
          2  |   1042.251   61.45233    16.96   0.000     921.8063    1162.695
          3  |    -324.35   62.09297    -5.22   0.000      -446.05     -202.65
          4  |   2.890715   56.27665     0.05   0.959    -107.4095    113.1909
          5  |   97.01108   56.96247     1.70   0.089    -14.63332    208.6555
          6  |   634.3098   62.34243    10.17   0.000     512.1209    756.4987
          7  |   201.7326   62.09297     3.25   0.001     80.03265    323.4326
          8  |  -30.82278   55.41033    -0.56   0.578     -139.425    77.77947
          9  |   26.45397   56.12237     0.47   0.637    -83.54385    136.4518
         10  |   140.8553   56.78667     2.48   0.013     29.55548    252.1552
         11  |  -4.274707   55.68586    -0.08   0.939     -113.417    104.8676
         12  |   1372.867   93.18683    14.73   0.000     1190.225     1555.51
         13  |   666.9838    77.2214     8.64   0.000     515.6326     818.335
         14  |   33.48866   56.13454     0.60   0.551    -76.53302    143.5103
         15  |   22.29164   55.48418     0.40   0.688    -86.45534    131.0386
         16  |  -59.91076   55.85448    -1.07   0.283    -169.3835    49.56202
         17  |   537.9884    61.0432     8.81   0.000     418.3459    657.6308
         18  |  -19.16764   55.39817    -0.35   0.729    -127.7461    89.41077
         19  |   706.5068   59.24086    11.93   0.000     590.3968    822.6167
         20  |   20.58012   55.43674     0.37   0.710    -88.07389    129.2341
         21  |   611.9616   56.76023    10.78   0.000     500.7136    723.2096
         22  |   574.0474   90.78702     6.32   0.000     396.1081    751.9867
         23  |   136.5829    56.4129     2.42   0.015     26.01561    247.1501
         24  |  -57.15799   56.65618    -1.01   0.313    -168.2021    53.88608
         25  |   2.058881   57.84107     0.04   0.972    -111.3075    115.4253
         26  |   92.93898   69.13556     1.34   0.179    -42.56423    228.4422
         27  |   27.03176   56.64803     0.48   0.633    -83.99633    138.0599
         28  |   221.2114   61.87794     3.57   0.000     99.93288    342.4899
         29  |   156.4642   58.31261     2.68   0.007     42.17355    270.7548
         30  |   8.218528   55.51065     0.15   0.882    -100.5804    117.0174
         31  |  -8.476102   56.90294    -0.15   0.882    -120.0038    103.0516
             |
       _cons |   59.23699   39.28961     1.51   0.132    -17.76922    136.2432
------------------------------------------------------------------------------

.
. xi: reg cos env i.firm
i.firm           _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  114.84
       Model |    34048840    31  1098349.68           Prob > F      =  0.0000
    Residual |  2065916.47   216  9564.42808           R-squared     =  0.9428
-------------+------------------------------           Adj R-squared =  0.9346
       Total |  36114756.4   247  146213.589           Root MSE      =  97.798
```

cos	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	20.75678	2.366252	8.77	0.000	16.09288	25.42068
_Ifirm_2	689.5757	54.24893	12.71	0.000	582.6507	796.5008
_Ifirm_3	-257.3685	54.81448	-4.70	0.000	-365.4083	-149.3288
_Ifirm_4	-17.85535	49.67994	-0.36	0.720	-115.7749	80.06418
_Ifirm_5	44.44084	50.28538	0.88	0.378	-54.67201	143.5537
_Ifirm_6	451.432	55.0347	8.20	0.000	342.9582	559.9058
_Ifirm_7	107.478	54.81448	1.96	0.051	-.5617659	215.5177
_Ifirm_8	-18.82336	48.91517	-0.38	0.701	-115.2355	77.58881
_Ifirm_9	2.182925	49.54375	0.04	0.965	-95.46817	99.83402
_Ifirm_10	70.45724	50.13018	1.41	0.161	-28.34973	169.2642
_Ifirm_11	-13.17892	49.1584	-0.27	0.789	-110.0705	83.71266
_Ifirm_12	959.0133	82.26354	11.66	0.000	796.8712	1121.155
_Ifirm_13	487.7657	68.16957	7.16	0.000	353.403	622.1285
_Ifirm_14	3.237143	49.55449	0.07	0.948	-94.43513	100.9094
_Ifirm_15	11.19991	48.98036	0.23	0.819	-85.34075	107.7406
_Ifirm_16	-50.24398	49.30726	-1.02	0.309	-147.429	46.941
_Ifirm_17	342.7633	53.88776	6.36	0.000	236.5501	448.9765
_Ifirm_18	-14.89406	48.90444	-0.30	0.761	-111.2851	81.49695
_Ifirm_19	406.0341	52.29669	7.76	0.000	302.9569	509.1113
_Ifirm_20	14.51989	48.93848	0.30	0.767	-81.93823	110.978
_Ifirm_21	486.0913	50.10684	9.70	0.000	387.3303	584.8522
_Ifirm_22	299.0065	80.14503	3.73	0.000	141.0401	456.973
_Ifirm_23	71.76908	49.80022	1.44	0.151	-26.38753	169.9257
_Ifirm_24	-57.16004	50.01499	-1.14	0.254	-155.7399	41.41987
_Ifirm_25	-37.51443	51.06099	-0.73	0.463	-138.156	63.12716
_Ifirm_26	45.33872	61.03155	0.74	0.458	-74.95492	165.6323
_Ifirm_27	13.91494	50.00779	0.28	0.781	-84.65079	112.4807
_Ifirm_28	155.8333	54.62465	2.85	0.005	48.16766	263.4989
_Ifirm_29	79.04695	51.47725	1.54	0.126	-22.41509	180.509
_Ifirm_30	-14.64289	49.00374	-0.30	0.765	-111.2296	81.94384
_Ifirm_31	-15.29766	50.23282	-0.30	0.761	-114.3069	83.7116
_cons	39.44762	34.68411	1.14	0.257	-28.91501	107.8103

. vif

Variable	VIF	1/VIF
env	8.24	0.121301
_Ifirm_12	5.48	0.182555
_Ifirm_22	5.20	0.192334
_Ifirm_13	3.76	0.265845
_Ifirm_26	3.02	0.331666
_Ifirm_6	2.45	0.407884
_Ifirm_3	2.43	0.411168
_Ifirm_7	2.43	0.411168
_Ifirm_28	2.42	0.414030
_Ifirm_2	2.38	0.419785
_Ifirm_17	2.35	0.425431
_Ifirm_19	2.21	0.451711
_Ifirm_29	2.14	0.466207
_Ifirm_25	2.11	0.473839
_Ifirm_5	2.05	0.488569
_Ifirm_31	2.04	0.489592
_Ifirm_10	2.03	0.491599
_Ifirm_21	2.03	0.492057

```
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of cos

         chi2(1)      =   495.52
         Prob > chi2  =   0.0000

. xtgls cos env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   4087.34
Log likelihood             = -1471.326          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         cos |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   20.75678    2.20832     9.40   0.000     16.42855    25.08501
             |
        firm |
          2  |   689.5757   50.62817    13.62   0.000     590.3463    788.8051
          3  |  -257.3685   51.15597    -5.03   0.000    -357.6324   -157.1047
          4  |  -17.85535   46.36413    -0.39   0.700    -108.7274    73.01667
          5  |   44.44084   46.92916     0.95   0.344    -47.53861    136.4203
          6  |    451.432   51.36149     8.79   0.000     350.7654    552.0987
          7  |    107.478   51.15597     2.10   0.036     7.214123    207.7418
          8  |  -18.82336    45.6504    -0.41   0.680    -108.2965    70.64979
          9  |   2.182925   46.23702     0.05   0.962    -88.43998    92.80583
         10  |   70.45724   46.78432     1.51   0.132    -21.23835    162.1528
         11  |  -13.17892    45.8774    -0.29   0.774     -103.097    76.73914
         12  |   959.0133   76.77298    12.49   0.000      808.541    1109.486
         13  |   487.7657   63.61969     7.67   0.000     363.0734     612.458
         14  |   3.237143   46.24705     0.07   0.944    -87.40542     93.8797
         15  |   11.19991   45.71124     0.25   0.806    -78.39248    100.7923
         16  |  -50.24398   46.01632    -1.09   0.275    -140.4343    39.94635
```

```
          17 |   342.7633   50.29111     6.82   0.000     244.1946    441.3321
          18 |  -14.89406   45.64038    -0.33   0.744    -104.3476    74.55945
          19 |   406.0341   48.80623     8.32   0.000     310.3757    501.6926
          20 |   14.51989   45.67216     0.32   0.751     -74.9959    104.0357
          21 |   486.0913   46.76253    10.39   0.000     394.4384    577.7442
          22 |   299.0065   74.79588     4.00   0.000     152.4093    445.6037
          23 |   71.76908   46.47638     1.54   0.123    -19.32295    162.8611
          24 |  -57.16004   46.67681    -1.22   0.221    -148.6449    34.32483
          25 |  -37.51443     47.653    -0.79   0.431    -130.9126    55.88373
          26 |   45.33872   56.95809     0.80   0.426    -66.29709    156.9745
          27 |   13.91494    46.6701     0.30   0.766    -77.55677    105.3866
          28 |   155.8333   50.97881     3.06   0.002     55.91662    255.7499
          29 |   79.04695   48.04148     1.65   0.100    -15.11262    173.2065
          30 |  -14.64289   45.73306    -0.32   0.749     -104.278    74.99225
          31 |  -15.29766   46.88011    -0.33   0.744     -107.181    76.58566
             |
       _cons |   39.44762   32.36917     1.22   0.223    -23.99478      102.89
------------------------------------------------------------------------------

.
. xi: reg ni env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   12.10
       Model |   118618.41    31  3826.40033           Prob > F      =  0.0000
    Residual |  68319.8165   216  316.295447           R-squared     =  0.6345
-------------+------------------------------           Adj R-squared =  0.5821
       Total |  186938.227   247  756.834926           Root MSE      =  17.785

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |     2.7359   .4303066     6.36   0.000     1.887762    3.584037
    _Ifirm_2 |  -1.491611   9.865251    -0.15   0.880     -20.9361    17.95287
    _Ifirm_3 |  -33.04496   9.968097    -3.32   0.001    -52.69216   -13.39777
    _Ifirm_4 |  -5.832808   9.034373    -0.65   0.519    -23.63962    11.97401
    _Ifirm_5 |  -9.825809   9.144473    -1.07   0.284    -27.84963    8.198015
    _Ifirm_6 |  -22.07236   10.00814    -2.21   0.028    -41.79849   -2.346236
    _Ifirm_7 |  -13.44146   9.968097    -1.35   0.179    -33.08866    6.205731
    _Ifirm_8 |    -3.1291   8.895299    -0.35   0.725     -20.6618     14.4036
    _Ifirm_9 |  -5.341399   9.009606    -0.59   0.554     -23.0994     12.4166
   _Ifirm_10 |  -3.112825   9.116251    -0.34   0.733    -21.08102    14.85537
   _Ifirm_11 |  -7.029912   8.939531    -0.79   0.433    -24.64979    10.58997
   _Ifirm_12 |  -29.15249   14.95975    -1.95   0.053    -58.63827    .3332931
   _Ifirm_13 |  -34.36378   12.39674    -2.77   0.006    -58.79785    -9.92971
   _Ifirm_14 |  -8.558596    9.01156    -0.95   0.343    -26.32045    9.203257
   _Ifirm_15 |  -3.443553   8.907154    -0.39   0.699    -20.99962    14.11251
   _Ifirm_16 |  -9.311859   8.966601    -1.04   0.300     -26.9851    8.361379
   _Ifirm_17 |  -29.25672   9.799573    -2.99   0.003    -48.57175   -9.941687
   _Ifirm_18 |  -2.531897   8.893347    -0.28   0.776    -20.06075    14.99696
   _Ifirm_19 |   76.82471   9.510234     8.08   0.000     58.07997    95.56946
   _Ifirm_20 |   1.742919   8.899539     0.20   0.845    -15.79814    19.28398
   _Ifirm_21 |  -8.124709   9.112005    -0.89   0.374    -26.08454    9.835121
   _Ifirm_22 |   -23.2588    14.5745    -1.60   0.112    -51.98524    5.467643
   _Ifirm_23 |  -5.756704   9.056246    -0.64   0.526    -23.60663    12.09323
   _Ifirm_24 |   -13.1477   9.095302    -1.45   0.150    -31.07461    4.779205
   _Ifirm_25 |  -12.58934   9.285519    -1.36   0.177    -30.89116    5.712492
   _Ifirm_26 |  -30.70453   11.09868    -2.77   0.006    -52.58011    -8.82895
   _Ifirm_27 |  -12.90891   9.093993    -1.42   0.157    -30.83324    5.015421
```

```
    _Ifirm_28 |   -23.8813   9.933577    -2.40   0.017    -43.46045   -4.302142
    _Ifirm_29 |  -6.299605   9.361216    -0.67   0.502    -24.75063    12.15142
    _Ifirm_30 |  -3.464507   8.911405    -0.39   0.698    -21.02895    14.09994
    _Ifirm_31 |  -8.986571   9.134915    -0.98   0.326    -26.99156    9.018416
        _cons |    1.91306   6.307358     0.30   0.762    -10.51879    14.34491
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |      8.24    0.121301
   _Ifirm_12 |      5.48    0.182555
   _Ifirm_22 |      5.20    0.192334
   _Ifirm_13 |      3.76    0.265845
   _Ifirm_26 |      3.02    0.331666
    _Ifirm_6 |      2.45    0.407884
    _Ifirm_3 |      2.43    0.411168
    _Ifirm_7 |      2.43    0.411168
   _Ifirm_28 |      2.42    0.414030
    _Ifirm_2 |      2.38    0.419785
   _Ifirm_17 |      2.35    0.425431
   _Ifirm_19 |      2.21    0.451711
   _Ifirm_29 |      2.14    0.466207
   _Ifirm_25 |      2.11    0.473839
    _Ifirm_5 |      2.05    0.488569
   _Ifirm_31 |      2.04    0.489592
   _Ifirm_10 |      2.03    0.491599
   _Ifirm_21 |      2.03    0.492057
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ni

         chi2(1)      =   261.15
         Prob > chi2  =   0.0000

. xtgls ni env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
```

```
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =    430.58
Log likelihood             = -1048.594          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |     2.7359   .4015864     6.81   0.000     1.948805    3.522995
             |
        firm |
          2  |  -1.491611    9.20681    -0.16   0.871    -19.53663    16.55341
          3  |  -33.04496   9.302792    -3.55   0.000     -51.2781   -14.81183
          4  |  -5.832808   8.431388    -0.69   0.489    -22.35802    10.69241
          5  |  -9.825809   8.534139    -1.15   0.250    -26.55241    6.900796
          6  |  -22.07236   9.340166    -2.36   0.018    -40.37875   -3.765974
          7  |  -13.44146   9.302792    -1.44   0.148     -31.6746    4.791674
          8  |    -3.1291   8.301596    -0.38   0.706    -19.39993    13.14173
          9  |  -5.341399   8.408274    -0.64   0.525    -21.82131    11.13852
         10  |  -3.112825   8.507801    -0.37   0.714    -19.78781    13.56216
         11  |  -7.029912   8.342876    -0.84   0.399    -23.38165    9.321824
         12  |  -29.15249   13.96128    -2.09   0.037     -56.5161   -1.788872
         13  |  -34.36378   11.56934    -2.97   0.003    -57.03927   -11.68829
         14  |  -8.558596   8.410098    -1.02   0.309    -25.04208    7.924892
         15  |  -3.443553    8.31266    -0.41   0.679    -19.73607    12.84896
         16  |  -9.311859   8.368139    -1.11   0.266    -25.71311    7.089392
         17  |  -29.25672   9.145515    -3.20   0.001     -47.1816   -11.33184
         18  |  -2.531897   8.299774    -0.31   0.760    -18.79915    13.73536
         19  |   76.82471   8.875487     8.66   0.000     59.42908    94.22035
         20  |   1.742919   8.305552     0.21   0.834    -14.53566     18.0215
         21  |  -8.124709   8.503838    -0.96   0.339    -24.79193    8.542507
         22  |   -23.2588   13.60174    -1.71   0.087    -49.91773     3.40013
         23  |  -5.756704   8.451801    -0.68   0.496    -22.32193    10.80852
         24  |   -13.1477    8.48825    -1.55   0.121    -29.78437    3.488961
         25  |  -12.58934   8.665771    -1.45   0.146    -29.57393    4.395264
         26  |  -30.70453   10.35792    -2.96   0.003    -51.00567   -10.40339
         27  |  -12.90891   8.487029    -1.52   0.128    -29.54318    3.725363
         28  |   -23.8813   9.270575    -2.58   0.010    -42.05129   -5.711302
         29  |  -6.299605   8.736416    -0.72   0.471    -23.42267    10.82346
         30  |  -3.464507   8.316627    -0.42   0.677     -19.7648    12.83578
         31  |  -8.986571   8.525219    -1.05   0.292    -25.69569    7.722552
             |
       _cons |    1.91306   5.886383     0.32   0.745     -9.62404    13.45016
------------------------------------------------------------------------------

.
. xi: reg curra env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  166.21
       Model |   15546413    31  501497.195           Prob > F      =  0.0000
    Residual | 651719.861   216  3017.22158           R-squared     =  0.9598
-------------+------------------------------           Adj R-squared =  0.9540
       Total | 16198132.9   247  65579.4855           Root MSE      =  54.929

------------------------------------------------------------------------------
```

curra	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	9.505995	1.329031	7.15	0.000	6.886465	12.12553
_Ifirm_2	475.3449	30.4695	15.60	0.000	415.2893	535.4005
_Ifirm_3	-124.641	30.78714	-4.05	0.000	-185.3227	-63.95931
_Ifirm_4	6.611832	27.90327	0.24	0.813	-48.38573	61.60939
_Ifirm_5	67.98954	28.24332	2.41	0.017	12.32174	123.6573
_Ifirm_6	270.3676	30.91083	8.75	0.000	209.4421	331.2931
_Ifirm_7	82.503	30.78714	2.68	0.008	21.82131	143.1847
_Ifirm_8	-18.45612	27.47373	-0.67	0.502	-72.60705	35.69481
_Ifirm_9	36.32632	27.82678	1.31	0.193	-18.52047	91.17311
_Ifirm_10	100.9517	28.15616	3.59	0.000	45.45565	156.4476
_Ifirm_11	-3.747717	27.61035	-0.14	0.892	-58.16792	50.67248
_Ifirm_12	685.207	46.2042	14.83	0.000	594.1382	776.2759
_Ifirm_13	318.1122	38.28817	8.31	0.000	242.6459	393.5785
_Ifirm_14	42.55108	27.83281	1.53	0.128	-12.3076	97.40977
_Ifirm_15	8.251723	27.51035	0.30	0.765	-45.97138	62.47483
_Ifirm_16	-16.3141	27.69396	-0.59	0.556	-70.8991	38.27089
_Ifirm_17	158.8259	30.26664	5.25	0.000	99.17016	218.4817
_Ifirm_18	-4.006332	27.4677	-0.15	0.884	-58.14538	50.13272
_Ifirm_19	699.8527	29.373	23.83	0.000	641.9583	757.7471
_Ifirm_20	13.39788	27.48683	0.49	0.626	-40.77886	67.57463
_Ifirm_21	212.5214	28.14305	7.55	0.000	157.0513	267.9916
_Ifirm_22	453.0988	45.01432	10.07	0.000	364.3752	541.8223
_Ifirm_23	58.95442	27.97083	2.11	0.036	3.823702	114.0851
_Ifirm_24	-17.79487	28.09146	-0.63	0.527	-73.16334	37.5736
_Ifirm_25	26.88838	28.67895	0.94	0.350	-29.63805	83.41482
_Ifirm_26	76.78417	34.27903	2.24	0.026	9.219952	144.3484
_Ifirm_27	46.87384	28.08741	1.67	0.097	-8.486662	102.2343
_Ifirm_28	131.7779	30.68053	4.30	0.000	71.3064	192.2495
_Ifirm_29	82.59531	28.91275	2.86	0.005	25.60806	139.5826
_Ifirm_30	32.87107	27.52348	1.19	0.234	-21.37791	87.12005
_Ifirm_31	18.32243	28.21381	0.65	0.517	-37.28719	73.93205
_cons	42.80259	19.4807	2.20	0.029	4.40598	81.1992

. vif

Variable	VIF	1/VIF
env	8.24	0.121301
_Ifirm_12	5.48	0.182555
_Ifirm_22	5.20	0.192334
_Ifirm_13	3.76	0.265845
_Ifirm_26	3.02	0.331666
_Ifirm_6	2.45	0.407884
_Ifirm_3	2.43	0.411168
_Ifirm_7	2.43	0.411168
_Ifirm_28	2.42	0.414030
_Ifirm_2	2.38	0.419785
_Ifirm_17	2.35	0.425431
_Ifirm_19	2.21	0.451711
_Ifirm_29	2.14	0.466207
_Ifirm_25	2.11	0.473839
_Ifirm_5	2.05	0.488569
_Ifirm_31	2.04	0.489592
_Ifirm_10	2.03	0.491599
_Ifirm_21	2.03	0.492057
_Ifirm_24	2.02	0.493866
_Ifirm_27	2.02	0.494008

```
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of curra

         chi2(1)      =   420.50
         Prob > chi2  =   0.0000

. xtgls curra env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   5915.90
Log likelihood             = -1328.265          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       curra |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   9.505995   1.240327     7.66   0.000     7.074999    11.93699
             |
        firm |
          2  |   475.3449   28.43586    16.72   0.000     419.6117    531.0782
          3  |   -124.641    28.7323    -4.34   0.000    -180.9553   -68.32672
          4  |   6.611832   26.04091     0.25   0.800    -44.42742    57.65108
          5  |   67.98954   26.35827     2.58   0.010     16.32829    119.6508
          6  |   270.3676   28.84774     9.37   0.000     213.8271    326.9081
          7  |     82.503    28.7323     2.87   0.004     26.18872    138.8173
          8  |  -18.45612   25.64004    -0.72   0.472    -68.70968    31.79743
          9  |   36.32632   25.96952     1.40   0.162    -14.57301    87.22565
         10  |   100.9517   26.27692     3.84   0.000     49.44984    152.4535
         11  |  -3.747717   25.76754    -0.15   0.884    -54.25116    46.75573
         12  |    685.207   43.12037    15.89   0.000     600.6926    769.7214
         13  |   318.1122   35.73269     8.90   0.000     248.0774     388.147
         14  |   42.55108   25.97516     1.64   0.101    -8.359286    93.46145
         15  |   8.251723   25.67421     0.32   0.748    -42.06881    58.57226
         16  |   -16.3141   25.84556    -0.63   0.528    -66.97048    34.34227
         17  |   158.8259   28.24654     5.62   0.000     103.4637    214.1881
         18  |  -4.006332   25.63441    -0.16   0.876    -54.24886    46.23619
```

```
          19 |   699.8527   27.41254    25.53   0.000     646.1251    753.5803
          20 |   13.39788   25.65226     0.52   0.601    -36.87963    63.67539
          21 |   212.5214   26.26468     8.09   0.000     161.0436    263.9993
          22 |   453.0988   42.00991    10.79   0.000     370.7609    535.4367
          23 |   58.95442   26.10396     2.26   0.024     7.791597    110.1172
          24 |  -17.79487   26.21653    -0.68   0.497    -69.17833     33.5886
          25 |   26.88838   26.76482     1.00   0.315     -25.5697    79.34647
          26 |   76.78417   31.99112     2.40   0.016     14.08272    139.4856
          27 |   46.87384   26.21276     1.79   0.074    -4.502229    98.24991
          28 |   131.7779    28.6328     4.60   0.000     75.65868    187.8972
          29 |   82.59531   26.98301     3.06   0.002     29.70957     135.481
          30 |   32.87107   25.68647     1.28   0.201    -17.47347    83.21562
          31 |   18.32243   26.33072     0.70   0.487    -33.28483    69.92969
             |
       _cons |   42.80259   18.18049     2.35   0.019      7.16948    78.43571
------------------------------------------------------------------------------

.
. xi: reg asset env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  227.17
       Model |   75044460    31  2420789.03           Prob > F      =  0.0000
    Residual |  2301746.8   216  10656.2352           R-squared     =  0.9702
-------------+------------------------------           Adj R-squared =  0.9660
       Total | 77346206.8   247  313142.538           Root MSE      =  103.23

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   15.43699   2.497661     6.18   0.000     10.51408     20.3599
    _Ifirm_2 |   1071.044   57.26161    18.70   0.000     958.1813    1183.907
    _Ifirm_3 |  -182.0322   57.85857    -3.15   0.002    -296.0719   -67.99251
    _Ifirm_4 |   95.87346   52.43889     1.83   0.069    -7.483979    199.2309
    _Ifirm_5 |   291.6806   53.07795     5.50   0.000     187.0636    396.2977
    _Ifirm_6 |   787.5198   58.09102    13.56   0.000     673.0219    902.0176
    _Ifirm_7 |   192.1808   57.85857     3.32   0.001     78.14115    306.2205
    _Ifirm_8 |  -27.91911   51.63165    -0.54   0.589    -129.6855    73.84725
    _Ifirm_9 |    104.253   52.29513     1.99   0.047     1.178935    207.3271
   _Ifirm_10 |   320.9329   52.91413     6.07   0.000     216.6388    425.2271
   _Ifirm_11 |    71.6615   51.88839     1.38   0.169    -30.61089    173.9339
   _Ifirm_12 |    1684.87     86.832    19.40   0.000     1513.723    1856.016
   _Ifirm_13 |   927.1284   71.95532    12.88   0.000     785.3039    1068.953
   _Ifirm_14 |   112.7237   52.30647     2.16   0.032     9.627288    215.8202
   _Ifirm_15 |   86.68179   51.70046     1.68   0.095     -15.2202    188.5838
   _Ifirm_16 |   6.980058   52.04551     0.13   0.893    -95.60204    109.5622
   _Ifirm_17 |   579.3524   56.88039    10.19   0.000     467.2407    691.4641
   _Ifirm_18 |   5.524927   51.62031     0.11   0.915     -96.2191     107.269
   _Ifirm_19 |   1322.252   55.20096    23.95   0.000      1213.45    1431.053
   _Ifirm_20 |   23.02077   51.65625     0.45   0.656    -78.79409    124.8356
   _Ifirm_21 |   839.3186   52.88949    15.87   0.000      735.073    943.5642
   _Ifirm_22 |   1305.934   84.59584    15.44   0.000     1139.195    1472.673
   _Ifirm_23 |   243.0423   52.56584     4.62   0.000     139.4347      346.65
   _Ifirm_24 |   30.13315   52.79254     0.57   0.569    -73.92134    134.1876
   _Ifirm_25 |   171.7363   53.89663     3.19   0.002     65.50568     277.967
   _Ifirm_26 |   313.7776    64.4209     4.87   0.000     186.8035    440.7516
   _Ifirm_27 |   137.6247   52.78494     2.61   0.010     33.58523    241.6643
   _Ifirm_28 |   498.3883    57.6582     8.64   0.000     384.7436     612.033
   _Ifirm_29 |   230.8136   54.33601     4.25   0.000     123.7169    337.9102
```

```
    _Ifirm_30 |    89.7376   51.72513     1.73   0.084    -12.21302    191.6882
    _Ifirm_31 |   110.4096   53.02247     2.08   0.038      5.90195    214.9173
        _cons |   61.16423   36.61027     1.67   0.096    -10.99489    133.3233
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |      8.24    0.121301
   _Ifirm_12 |      5.48    0.182555
   _Ifirm_22 |      5.20    0.192334
   _Ifirm_13 |      3.76    0.265845
   _Ifirm_26 |      3.02    0.331666
    _Ifirm_6 |      2.45    0.407884
    _Ifirm_3 |      2.43    0.411168
    _Ifirm_7 |      2.43    0.411168
   _Ifirm_28 |      2.42    0.414030
    _Ifirm_2 |      2.38    0.419785
   _Ifirm_17 |      2.35    0.425431
   _Ifirm_19 |      2.21    0.451711
   _Ifirm_29 |      2.14    0.466207
   _Ifirm_25 |      2.11    0.473839
    _Ifirm_5 |      2.05    0.488569
   _Ifirm_31 |      2.04    0.489592
   _Ifirm_10 |      2.03    0.491599
   _Ifirm_21 |      2.03    0.492057
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of asset

         chi2(1)      =   407.28
         Prob > chi2  =   0.0000

. xtgls asset env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   8085.61
Log likelihood             =  -1484.73          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   15.43699   2.330958     6.62   0.000      10.8684    20.00558
             |
        firm |
          2  |   1071.044   53.43977    20.04   0.000     966.3043    1175.784
          3  |  -182.0322   53.99689    -3.37   0.001    -287.8641   -76.20023
          4  |   95.87346   48.93893     1.96   0.050    -.0450881     191.792
          5  |   291.6806   49.53534     5.89   0.000     194.5932    388.7681
          6  |   787.5198   54.21382    14.53   0.000     681.2626    893.7769
          7  |   192.1808   53.99689     3.56   0.000     86.34886    298.0128
          8  |  -27.91911   48.18557    -0.58   0.562    -122.3611    66.52287
          9  |    104.253   48.80477     2.14   0.033     8.597433    199.9086
         10  |   320.9329   49.38246     6.50   0.000     224.1451    417.7208
         11  |    71.6615   48.42517     1.48   0.139    -23.2501     166.5731
         12  |    1684.87   81.03653    20.79   0.000     1526.041    1843.698
         13  |   927.1284   67.15278    13.81   0.000     795.5114    1058.745
         14  |   112.7237   48.81536     2.31   0.021     17.04739    208.4001
         15  |   86.68179   48.24979     1.80   0.072    -7.886059    181.2496
         16  |   6.980058   48.57181     0.14   0.886    -88.21895    102.1791
         17  |   579.3524     53.084    10.91   0.000     475.3097    683.3951
         18  |   5.524927     48.175     0.11   0.909    -88.89633    99.94618
         19  |   1322.252   51.51665    25.67   0.000     1221.281    1423.223
         20  |   23.02077   48.20854     0.48   0.633    -71.46622    117.5078
         21  |   839.3186   49.35946    17.00   0.000     742.5758    936.0613
         22  |   1305.934   78.94962    16.54   0.000     1151.196    1460.673
         23  |   243.0423   49.05742     4.95   0.000     146.8916    339.1931
         24  |   30.13315   49.26898     0.61   0.541    -66.43228    126.6986
         25  |   171.7363   50.29938     3.41   0.001     73.15136    270.3213
         26  |   313.7776   60.12122     5.22   0.000     195.9421     431.613
         27  |   137.6247   49.26189     2.79   0.005     41.07321    234.1763
         28  |   498.3883   53.80989     9.26   0.000     392.9229    603.8538
         29  |   230.8136   50.70943     4.55   0.000     131.4249    330.2022
         30  |    89.7376   48.27282     1.86   0.063    -4.87538     184.3506
         31  |   110.4096   49.48357     2.23   0.026     13.42363    207.3956
             |
       _cons |   61.16423   34.16677     1.79   0.073    -5.801417    128.1299
------------------------------------------------------------------------------

.
. xi: reg currl env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  295.60
       Model |  11440056.7    31  369034.088           Prob > F      =  0.0000
    Residual |  269659.419   216  1248.42324           R-squared     =  0.9770
-------------+------------------------------           Adj R-squared =  0.9737
       Total |  11709716.2   247  47407.7577           Root MSE      =  35.333

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
         env |   3.044882   .8548944     3.56   0.000     1.359878    4.729885
    _Ifirm_2 |   374.2719   19.59939    19.10   0.000     335.6414    412.9025
    _Ifirm_3 |  -45.23781   19.80372    -2.28   0.023    -84.27108   -6.204536
    _Ifirm_4 |   43.48432   17.94868     2.42   0.016     8.107344     78.8613
    _Ifirm_5 |   89.76958   18.16741     4.94   0.000     53.96147    125.5777
    _Ifirm_6 |   391.6468   19.88328    19.70   0.000     352.4567    430.8369
    _Ifirm_7 |   109.9434   19.80372     5.55   0.000     70.91017    148.9767
    _Ifirm_8 |  -2.618481   17.67238    -0.15   0.882    -37.45087    32.21391
    _Ifirm_9 |   35.78701   17.89947     2.00   0.047     .5070117    71.06701
   _Ifirm_10 |   55.24981   18.11135     3.05   0.003     19.55221    90.94741
   _Ifirm_11 |   33.35008   17.76025     1.88   0.062    -1.655515    68.35567
   _Ifirm_12 |     853.44   29.72068    28.72   0.000     794.8603    912.0197
   _Ifirm_13 |   417.6427   24.62873    16.96   0.000     369.0993    466.1861
   _Ifirm_14 |   60.76075   17.90336     3.39   0.001      25.4731     96.0484
   _Ifirm_15 |   32.69833   17.69593     1.85   0.066    -2.180481    67.57714
   _Ifirm_16 |  -3.860859   17.81404    -0.22   0.829    -38.97246    31.25074
   _Ifirm_17 |   259.0056   19.46891    13.30   0.000     220.6322     297.379
   _Ifirm_18 |   5.199021    17.6685     0.29   0.769    -29.62572    40.02377
   _Ifirm_19 |   301.0683   18.89407    15.93   0.000     263.8279    338.3087
   _Ifirm_20 |   11.60074    17.6808     0.66   0.512    -23.24825    46.44973
   _Ifirm_21 |   370.2332   18.10291    20.45   0.000     334.5522    405.9142
   _Ifirm_22 |   488.9773    28.9553    16.89   0.000     431.9062    546.0484
   _Ifirm_23 |   87.66636   17.99213     4.87   0.000     52.20373     123.129
   _Ifirm_24 |   13.45084   18.06973     0.74   0.457    -22.16473     49.0664
   _Ifirm_25 |   60.77066   18.44763     3.29   0.001     24.41024    97.13108
   _Ifirm_26 |   222.3852   22.04986    10.09   0.000     178.9247    265.8456
   _Ifirm_27 |   58.74336   18.06713     3.25   0.001     23.13292    94.35381
   _Ifirm_28 |   280.7575   19.73514    14.23   0.000     241.8594    319.6556
   _Ifirm_29 |   77.73712   18.59802     4.18   0.000     41.08028     114.394
   _Ifirm_30 |    10.8515   17.70438     0.61   0.541    -24.04396    45.74695
   _Ifirm_31 |   36.28764   18.14843     2.00   0.047     .5169568    72.05833
       _cons |   21.11129   12.53089     1.68   0.093    -3.587195    45.80977
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.24    0.121301
   _Ifirm_12 |      5.48    0.182555
   _Ifirm_22 |      5.20    0.192334
   _Ifirm_13 |      3.76    0.265845
   _Ifirm_26 |      3.02    0.331666
    _Ifirm_6 |      2.45    0.407884
    _Ifirm_3 |      2.43    0.411168
    _Ifirm_7 |      2.43    0.411168
   _Ifirm_28 |      2.42    0.414030
    _Ifirm_2 |      2.38    0.419785
   _Ifirm_17 |      2.35    0.425431
   _Ifirm_19 |      2.21    0.451711
   _Ifirm_29 |      2.14    0.466207
   _Ifirm_25 |      2.11    0.473839
    _Ifirm_5 |      2.05    0.488569
   _Ifirm_31 |      2.04    0.489592
   _Ifirm_10 |      2.03    0.491599
   _Ifirm_21 |      2.03    0.492057
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
```

```
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of currl

         chi2(1)      =   266.69
         Prob > chi2  =   0.0000

. xtgls currl env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =  10521.18
Log likelihood             = -1218.841          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   3.044882   .7978358     3.82   0.000     1.481152    4.608611
             |
        firm |
          2  |   374.2719   18.29126    20.46   0.000     338.4217    410.1222
          3  |  -45.23781   18.48195    -2.45   0.014    -81.46176   -9.013857
          4  |   43.48432   16.75072     2.60   0.009     10.65351    76.31513
          5  |   89.76958   16.95486     5.29   0.000     56.53867    123.0005
          6  |   391.6468    18.5562    21.11   0.000     355.2773    428.0163
          7  |   109.9434   18.48195     5.95   0.000     73.71949    146.1674
          8  |  -2.618481   16.49286    -0.16   0.874     -34.9439    29.70693
          9  |   35.78701    16.7048     2.14   0.032       3.0462    68.52782
         10  |   55.24981   16.90253     3.27   0.001     22.12146    88.37816
         11  |   33.35008   16.57487     2.01   0.044     .8639246    65.83623
         12  |     853.44   27.73702    30.77   0.000     799.0764    907.8036
         13  |   417.6427   22.98492    18.17   0.000     372.5931    462.6923
         14  |   60.76075   16.70842     3.64   0.000     28.01284    93.50866
         15  |   32.69833   16.51484     1.98   0.048     .3298341    65.06683
         16  |  -3.860859   16.62506    -0.23   0.816    -36.44539    28.72367
         17  |   259.0056   18.16949    14.25   0.000     223.3941    294.6171
         18  |   5.199021   16.48924     0.32   0.753     -27.1193    37.51734
         19  |   301.0683   17.63302    17.07   0.000     266.5082    335.6284
         20  |   11.60074   16.50072     0.70   0.482    -20.74008    43.94156
```

```
          21  |   370.2332   16.89466    21.91   0.000     337.1203    403.3461
          22  |   488.9773   27.02272    18.10   0.000     436.0138    541.9409
          23  |   87.66636   16.79128     5.22   0.000     54.75606    120.5767
          24  |   13.45084   16.86369     0.80   0.425    -19.60139    46.50306
          25  |   60.77066   17.21637     3.53   0.000     27.02719    94.51413
          26  |   222.3852   20.57817    10.81   0.000     182.0527    262.7177
          27  |   58.74336   16.86126     3.48   0.000      25.6959    91.79083
          28  |   280.7575   18.41794    15.24   0.000      244.659     316.856
          29  |   77.73712   17.35672     4.48   0.000     43.71856    111.7557
          30  |    10.8515   16.52272     0.66   0.511    -21.53245    43.23544
          31  |   36.28764   16.93714     2.14   0.032     3.091462    69.48382
              |
       _cons  |   21.11129   11.69454     1.81   0.071    -1.809584    44.03215
------------------------------------------------------------------------------

.
. xi: reg ltd env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  156.34
       Model |  3444899.35    31  111125.785           Prob > F      =  0.0000
    Residual |  153536.122   216  710.815382           R-squared     =  0.9573
-------------+------------------------------           Adj R-squared =  0.9512
       Total |  3598435.47   247  14568.5647           Root MSE      =  26.661

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |  -1.257415   .6450746    -1.95   0.053    -2.528862    .0140318
    _Ifirm_2 |   193.7241   14.78904    13.10   0.000     164.5748    222.8735
    _Ifirm_3 |   13.34018   14.94322     0.89   0.373    -16.11302    42.79338
    _Ifirm_4 |   31.21165   13.54347     2.30   0.022     4.517371    57.90593
    _Ifirm_5 |   91.51956   13.70852     6.68   0.000     64.49996    118.5392
    _Ifirm_6 |   335.0477   15.00326    22.33   0.000     305.4761    364.6192
    _Ifirm_7 |   39.77681   14.94322     2.66   0.008     10.32361    69.23001
    _Ifirm_8 |   1.784334   13.33498     0.13   0.894    -24.49902    28.06769
    _Ifirm_9 |   10.00722   13.50634     0.74   0.460    -16.61388    36.62832
   _Ifirm_10 |   28.47048   13.66621     2.08   0.038     1.534268    55.40669
   _Ifirm_11 |   16.56771   13.40129     1.24   0.218    -9.846334    42.98176
   _Ifirm_12 |   477.1877   22.42623    21.28   0.000     432.9855      521.39
   _Ifirm_13 |   302.1877   18.58401    16.26   0.000     265.5584    338.8169
   _Ifirm_14 |   23.42608   13.50927     1.73   0.084    -3.200794    50.05296
   _Ifirm_15 |    25.7431   13.35276     1.93   0.055    -.5752857    52.06148
   _Ifirm_16 |   9.037375   13.44187     0.67   0.502    -17.45666    35.53141
   _Ifirm_17 |   94.54593   14.69058     6.44   0.000     65.59068    123.5012
   _Ifirm_18 |   3.373673   13.33206     0.25   0.800    -22.90391    29.65126
   _Ifirm_19 |    76.2892   14.25683     5.35   0.000     48.18887    104.3895
   _Ifirm_20 |   .5413532   13.34134     0.04   0.968    -25.75453    26.83723
   _Ifirm_21 |   271.5438   13.65985    19.88   0.000     244.6201    298.4674
   _Ifirm_22 |    361.673    21.8487    16.55   0.000     318.6091     404.737
   _Ifirm_23 |   87.07015   13.57626     6.41   0.000     60.31124    113.8291
   _Ifirm_24 |   23.73711   13.63481     1.74   0.083    -3.137198    50.61142
   _Ifirm_25 |   79.77513   13.91996     5.73   0.000     52.33878    107.2115
   _Ifirm_26 |   170.3307   16.63808    10.24   0.000     137.5369    203.1244
   _Ifirm_27 |   50.72513   13.63285     3.72   0.000     23.85469    77.59557
   _Ifirm_28 |   232.7747   14.89147    15.63   0.000     203.4235    262.1259
   _Ifirm_29 |   48.18782   14.03344     3.43   0.001      20.5278    75.84784
   _Ifirm_30 |   11.51807   13.35913     0.86   0.390    -14.81287    37.84901
   _Ifirm_31 |   37.80919   13.69419     2.76   0.006     10.81783    64.80055
```

```
       _cons |   1.555607    9.45539     0.16   0.869    -17.08104    20.19225
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.24    0.121301
   _Ifirm_12 |      5.48    0.182555
   _Ifirm_22 |      5.20    0.192334
   _Ifirm_13 |      3.76    0.265845
   _Ifirm_26 |      3.02    0.331666
    _Ifirm_6 |      2.45    0.407884
    _Ifirm_3 |      2.43    0.411168
    _Ifirm_7 |      2.43    0.411168
   _Ifirm_28 |      2.42    0.414030
    _Ifirm_2 |      2.38    0.419785
   _Ifirm_17 |      2.35    0.425431
   _Ifirm_19 |      2.21    0.451711
   _Ifirm_29 |      2.14    0.466207
   _Ifirm_25 |      2.11    0.473839
    _Ifirm_5 |      2.05    0.488569
   _Ifirm_31 |      2.04    0.489592
   _Ifirm_10 |      2.03    0.491599
   _Ifirm_21 |      2.03    0.492057
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of ltd

         chi2(1)      =   252.39
         Prob > chi2  =   0.0000

. xtgls ltd env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
```

```
Estimated coefficients     =        32          Time periods        =         8
                                                Wald chi2(31)       =   5564.39
Log likelihood             = -1149.001          Prob > chi2         =    0.0000

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |  -1.257415   .6020201    -2.09   0.037    -2.437353   -.0774774
             |
        firm |
          2  |   193.7241   13.80197    14.04   0.000     166.6728    220.7755
          3  |   13.34018   13.94586     0.96   0.339     -13.9932    40.67356
          4  |   31.21165   12.63953     2.47   0.014     6.438625    55.98468
          5  |   91.51956   12.79357     7.15   0.000     66.44463    116.5945
          6  |   335.0477   14.00189    23.93   0.000     307.6045    362.4909
          7  |   39.77681   13.94586     2.85   0.004     12.44343    67.11019
          8  |   1.784334   12.44496     0.14   0.886    -22.60734    26.17601
          9  |   10.00722   12.60488     0.79   0.427     -14.6979    34.71233
         10  |   28.47048   12.75408     2.23   0.026     3.472934    53.46802
         11  |   16.56771   12.50684     1.32   0.185     -7.94525    41.08067
         12  |   477.1877   20.92943    22.80   0.000     436.1668    518.2087
         13  |   302.1877   17.34365    17.42   0.000     268.1947    336.1806
         14  |   23.42608   12.60762     1.86   0.063    -1.284392    48.13655
         15  |    25.7431   12.46155     2.07   0.039     1.318913    50.16728
         16  |   9.037375   12.54472     0.72   0.471    -15.54982    33.62457
         17  |   94.54593   13.71008     6.90   0.000     67.67466    121.4172
         18  |   3.373673   12.44223     0.27   0.786    -21.01265    27.75999
         19  |    76.2892   13.30528     5.73   0.000     50.21132    102.3671
         20  |   .5413532   12.45089     0.04   0.965    -23.86195    24.94465
         21  |   271.5438   12.74814    21.30   0.000     246.5579    296.5297
         22  |    361.673   20.39044    17.74   0.000     321.7085    401.6376
         23  |   87.07015   12.67013     6.87   0.000     62.23714    111.9032
         24  |   23.73711   12.72477     1.87   0.062    -1.202987    48.67721
         25  |   79.77513    12.9909     6.14   0.000     54.31344    105.2368
         26  |   170.3307    15.5276    10.97   0.000     139.8971    200.7642
         27  |   50.72513   12.72294     3.99   0.000     25.78862    75.66164
         28  |   232.7747   13.89756    16.75   0.000     205.5359    260.0134
         29  |   48.18782    13.0968     3.68   0.000     22.51856    73.85708
         30  |   11.51807   12.46749     0.92   0.356    -12.91777    35.95391
         31  |   37.80919    12.7802     2.96   0.003     12.76047    62.85791
             |
       _cons |   1.555607   8.824304     0.18   0.860    -15.73971    18.85093
------------------------------------------------------------------------------

.
. xi: reg liab env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =  344.65
       Model |  33075351.1    31  1066946.81           Prob > F      =  0.0000
    Residual |  668687.064   216  3095.77344           R-squared     =  0.9802
-------------+------------------------------           Adj R-squared =  0.9773
       Total |  33744038.1   247  136615.539           Root MSE      =   55.64

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.395633    1.34622     1.78   0.077    -.2577773    5.049043
    _Ifirm_2 |   708.3629   30.86358    22.95   0.000     647.5306    769.1953
```

_Ifirm_3	-36.88951	31.18533	-1.18	0.238	-98.35603	24.57701
_Ifirm_4	95.22069	28.26416	3.37	0.001	39.51182	150.9296
_Ifirm_5	203.6516	28.60861	7.12	0.000	147.2638	260.0394
_Ifirm_6	792.7235	31.31062	25.32	0.000	731.01	854.437
_Ifirm_7	175.4405	31.18533	5.63	0.000	113.974	236.907
_Ifirm_8	2.21925	27.82907	0.08	0.937	-52.63205	57.07055
_Ifirm_9	62.78703	28.18668	2.23	0.027	7.230871	118.3432
_Ifirm_10	118.7809	28.52032	4.16	0.000	62.56714	174.9947
_Ifirm_11	56.89703	27.96745	2.03	0.043	1.772983	112.0211
_Ifirm_12	1455.999	46.80179	31.11	0.000	1363.752	1548.245
_Ifirm_13	771.7184	38.78338	19.90	0.000	695.2761	848.1608
_Ifirm_14	96.55965	28.19279	3.42	0.001	40.99145	152.1279
_Ifirm_15	72.70301	27.86616	2.61	0.010	17.7786	127.6274
_Ifirm_16	10.95474	28.05214	0.39	0.697	-44.33624	66.24571
_Ifirm_17	423.2217	30.6581	13.80	0.000	362.7944	483.6491
_Ifirm_18	12.72712	27.82296	0.46	0.648	-42.11214	67.56638
_Ifirm_19	420.9177	29.7529	14.15	0.000	362.2745	479.5609
_Ifirm_20	13.03247	27.84233	0.47	0.640	-41.84498	67.90991
_Ifirm_21	717.3414	28.50704	25.16	0.000	661.1539	773.529
_Ifirm_22	975.5136	45.59652	21.39	0.000	885.6425	1065.385
_Ifirm_23	201.5342	28.33259	7.11	0.000	145.6904	257.3779
_Ifirm_24	40.78579	28.45478	1.43	0.153	-15.29879	96.87038
_Ifirm_25	154.8772	29.04988	5.33	0.000	97.61963	212.1347
_Ifirm_26	411.9207	34.72238	11.86	0.000	343.4827	480.3588
_Ifirm_27	111.0344	28.45069	3.90	0.000	54.95789	167.1109
_Ifirm_28	541.2102	31.07734	17.41	0.000	479.9565	602.4639
_Ifirm_29	146.9041	29.2867	5.02	0.000	89.17982	204.6284
_Ifirm_30	46.96284	27.87946	1.68	0.094	-7.98778	101.9135
_Ifirm_31	80.40825	28.57871	2.81	0.005	24.07939	136.7371
_cons	23.19926	19.73266	1.18	0.241	-15.69396	62.09248

. vif

Variable	VIF	1/VIF
env	8.24	0.121301
_Ifirm_12	5.48	0.182555
_Ifirm_22	5.20	0.192334
_Ifirm_13	3.76	0.265845
_Ifirm_26	3.02	0.331666
_Ifirm_6	2.45	0.407884
_Ifirm_3	2.43	0.411168
_Ifirm_7	2.43	0.411168
_Ifirm_28	2.42	0.414030
_Ifirm_2	2.38	0.419785
_Ifirm_17	2.35	0.425431
_Ifirm_19	2.21	0.451711
_Ifirm_29	2.14	0.466207
_Ifirm_25	2.11	0.473839
_Ifirm_5	2.05	0.488569
_Ifirm_31	2.04	0.489592
_Ifirm_10	2.03	0.491599
_Ifirm_21	2.03	0.492057
_Ifirm_24	2.02	0.493866
_Ifirm_27	2.02	0.494008
_Ifirm_23	2.01	0.498135
_Ifirm_4	2.00	0.500550
_Ifirm_14	1.99	0.503087
_Ifirm_9	1.99	0.503306

```
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of liab

         chi2(1)      =   303.65
         Prob > chi2  =   0.0000

. xtgls liab env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =  12266.85
Log likelihood             = -1331.452          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.395633   1.256369     1.91   0.057    -.0668048    4.858071
             |
        firm |
          2  |   708.3629   28.80364    24.59   0.000     651.9088     764.817
          3  |  -36.88951   29.10391    -1.27   0.205    -93.93214    20.15311
          4  |   95.22069   26.37772     3.61   0.000     43.52132    146.9201
          5  |   203.6516   26.69917     7.63   0.000     151.3222     255.981
          6  |   792.7235   29.22084    27.13   0.000     735.4517    849.9953
          7  |   175.4405   29.10391     6.03   0.000     118.3979    232.4831
          8  |    2.21925   25.97166     0.09   0.932    -48.68427    53.12277
          9  |   62.78703    26.3054     2.39   0.017     11.22939    114.3447
         10  |   118.7809   26.61677     4.46   0.000     66.61298    170.9488
         11  |   56.89703    26.1008     2.18   0.029     5.740398    108.0537
         12  |   1455.999   43.67808    33.33   0.000     1370.391    1541.606
         13  |   771.7184   36.19484    21.32   0.000     700.7779     842.659
         14  |   96.55965   26.31111     3.67   0.000     44.99083    148.1285
         15  |   72.70301   26.00627     2.80   0.005     21.73165    123.6744
         16  |   10.95474   26.17984     0.42   0.676    -40.35681    62.26628
         17  |   423.2217   28.61187    14.79   0.000     367.1435       479.3
         18  |   12.72712   25.96596     0.49   0.624    -38.16522    63.61947
         19  |   420.9177   27.76709    15.16   0.000     366.4952    475.3402
         20  |   13.03247   25.98404     0.50   0.616    -37.89531    63.96025
         21  |   717.3414   26.60438    26.96   0.000     665.1978    769.4851
         22  |   975.5136   42.55325    22.92   0.000     892.1108    1058.916
```

```
          23 |   201.5342   26.44158     7.62   0.000     149.7096    253.3587
          24 |   40.78579   26.55561     1.54   0.125    -11.26225    92.83383
          25 |   154.8772   27.11099     5.71   0.000     101.7406    208.0137
          26 |   411.9207   32.40489    12.71   0.000     348.4083    475.4331
          27 |   111.0344   26.55179     4.18   0.000     58.99385     163.075
          28 |   541.2102   29.00313    18.66   0.000     484.3651    598.0553
          29 |   146.9041     27.332     5.37   0.000     93.33438    200.4739
          30 |   46.96284   26.01868     1.80   0.071    -4.032848    97.95852
          31 |   80.40825   26.67127     3.01   0.003     28.13352     132.683
             |
       _cons |   23.19926   18.41563     1.26   0.208    -12.89472    59.29323
------------------------------------------------------------------------------

.
. xi: reg oe env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   81.92
       Model |  13397825.3    31  432187.914           Prob > F      =  0.0000
    Residual |  1139525.26   216   5275.5799           R-squared     =  0.9216
-------------+------------------------------           Adj R-squared =  0.9104
       Total |  14537350.6   247  58855.6704           Root MSE      =  72.633

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   13.04136   1.757384     7.42   0.000     9.577542    16.50518
    _Ifirm_2 |   362.6814   40.28996     9.00   0.000     283.2696    442.0932
    _Ifirm_3 |  -145.1427   40.70998    -3.57   0.000    -225.3824     -64.903
    _Ifirm_4 |    .652763   36.89663     0.02   0.986    -72.07076    73.37629
    _Ifirm_5 |   88.02904   37.34628     2.36   0.019     14.41925    161.6388
    _Ifirm_6 |  -5.203756   40.87353    -0.13   0.899     -85.7658    75.35829
    _Ifirm_7 |   16.74032   40.70998     0.41   0.681    -63.49935       96.98
    _Ifirm_8 |  -30.13836   36.32864    -0.83   0.408    -101.7424    41.46567
    _Ifirm_9 |     41.466   36.79548     1.13   0.261    -31.05817    113.9902
   _Ifirm_10 |    202.152   37.23102     5.43   0.000     128.7694    275.5346
   _Ifirm_11 |   14.76446   36.50929     0.40   0.686    -57.19562    86.72454
   _Ifirm_12 |   228.8713   61.09603     3.75   0.000     108.4505     349.292
   _Ifirm_13 |     155.41   50.62863     3.07   0.002     55.62056    255.1994
   _Ifirm_14 |   16.16409   36.80346     0.44   0.661    -56.37581    88.70398
   _Ifirm_15 |   13.97878   36.37706     0.38   0.701    -57.72068    85.67824
   _Ifirm_16 |   -3.97468   36.61984    -0.11   0.914    -76.15267    68.20331
   _Ifirm_17 |   156.1307   40.02172     3.90   0.000     77.24759    235.0138
   _Ifirm_18 |  -7.202195   36.32067    -0.20   0.843    -78.79051    64.38612
   _Ifirm_19 |   901.3343   38.84005    23.21   0.000     824.7802    977.8883
   _Ifirm_20 |   9.988304   36.34596     0.27   0.784    -61.64985    81.62646
   _Ifirm_21 |   121.9771   37.21368     3.28   0.001     48.62868    195.3256
   _Ifirm_22 |   330.4206   59.52264     5.55   0.000     213.1011    447.7402
   _Ifirm_23 |   41.50815   36.98596     1.12   0.263    -31.39145    114.4077
   _Ifirm_24 |  -10.65264   37.14546    -0.29   0.775    -83.86662    62.56134
   _Ifirm_25 |   16.85917   37.92231     0.44   0.657    -57.88599    91.60434
   _Ifirm_26 |  -98.14319   45.32731    -2.17   0.031    -187.4837   -8.802718
   _Ifirm_27 |   26.59033   37.14012     0.72   0.475    -46.61312    99.79378
   _Ifirm_28 |  -42.82191     40.569    -1.06   0.292    -122.7837    37.13989
   _Ifirm_29 |   83.90945   38.23146     2.19   0.029     8.554946    159.2639
   _Ifirm_30 |   42.77477   36.39442     1.18   0.241    -28.95891    114.5084
   _Ifirm_31 |   30.00139   37.30724     0.80   0.422    -43.53147    103.5342
       _cons |   37.96497   25.75942     1.47   0.142    -12.80705    88.73699
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.24    0.121301
   _Ifirm_12 |      5.48    0.182555
   _Ifirm_22 |      5.20    0.192334
   _Ifirm_13 |      3.76    0.265845
   _Ifirm_26 |      3.02    0.331666
    _Ifirm_6 |      2.45    0.407884
    _Ifirm_3 |      2.43    0.411168
    _Ifirm_7 |      2.43    0.411168
   _Ifirm_28 |      2.42    0.414030
    _Ifirm_2 |      2.38    0.419785
   _Ifirm_17 |      2.35    0.425431
   _Ifirm_19 |      2.21    0.451711
   _Ifirm_29 |      2.14    0.466207
   _Ifirm_25 |      2.11    0.473839
    _Ifirm_5 |      2.05    0.488569
   _Ifirm_31 |      2.04    0.489592
   _Ifirm_10 |      2.03    0.491599
   _Ifirm_21 |      2.03    0.492057
   _Ifirm_24 |      2.02    0.493866
   _Ifirm_27 |      2.02    0.494008
   _Ifirm_23 |      2.01    0.498135
    _Ifirm_4 |      2.00    0.500550
   _Ifirm_14 |      1.99    0.503087
    _Ifirm_9 |      1.99    0.503306
   _Ifirm_16 |      1.97    0.508145
   _Ifirm_11 |      1.96    0.511227
   _Ifirm_30 |      1.94    0.514459
   _Ifirm_15 |      1.94    0.514950
   _Ifirm_20 |      1.94    0.515832
    _Ifirm_8 |      1.94    0.516324
   _Ifirm_18 |      1.94    0.516551
-------------+----------------------
    Mean VIF |      2.59

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of oe

         chi2(1)      =   589.62
         Prob > chi2  =   0.0000

. xtgls oe env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2915.83
```

```
Log likelihood          = -1397.551        Prob > chi2       =    0.0000

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   13.04136    1.64009     7.95   0.000     9.826841    16.25588
             |
        firm |
          2  |   362.6814   37.60086     9.65   0.000     288.9851    436.3777
          3  |  -145.1427   37.99285    -3.82   0.000    -219.6073   -70.67805
          4  |    .652763   34.43402     0.02   0.985    -66.83667     68.1422
          5  |   88.02904   34.85366     2.53   0.012     19.71713    156.3409
          6  |  -5.203756   38.14549    -0.14   0.891    -79.96755    69.56004
          7  |   16.74032   37.99285     0.44   0.659     -57.7243    91.20495
          8  |  -30.13836   33.90394    -0.89   0.374    -96.58886    36.31215
          9  |     41.466   34.33962     1.21   0.227    -25.83842    108.7704
         10  |    202.152   34.74609     5.82   0.000     134.0509    270.2531
         11  |   14.76446   34.07253     0.43   0.665    -52.01647     81.5454
         12  |   228.8713   57.01827     4.01   0.000     117.1175     340.625
         13  |     155.41    47.2495     3.29   0.001     62.80265    248.0173
         14  |   16.16409   34.34707     0.47   0.638    -51.15493     83.4831
         15  |   13.97878   33.94913     0.41   0.681    -52.56029    80.51785
         16  |   -3.97468   34.17571    -0.12   0.907    -70.95784    63.00848
         17  |   156.1307   37.35053     4.18   0.000       82.925    229.3364
         18  |  -7.202195    33.8965    -0.21   0.832    -73.63812    59.23373
         19  |   901.3343   36.24773    24.87   0.000       830.29    972.3785
         20  |   9.988304    33.9201     0.29   0.768    -56.49388    76.47048
         21  |   121.9771   34.72991     3.51   0.000     53.90775    190.0465
         22  |   330.4206    55.5499     5.95   0.000     221.5448    439.2964
         23  |   41.50815   34.51739     1.20   0.229    -26.14468     109.161
         24  |  -10.65264   34.66624    -0.31   0.759    -78.59723    57.29195
         25  |   16.85917   35.39125     0.48   0.634    -52.50639    86.22474
         26  |  -98.14319   42.30201    -2.32   0.020    -181.0536   -15.23277
         27  |   26.59033   34.66126     0.77   0.443    -41.34448    94.52514
         28  |  -42.82191   37.86128    -1.13   0.258    -117.0287    31.38484
         29  |   83.90945   35.67976     2.35   0.019      13.9784    153.8405
         30  |   42.77477   33.96533     1.26   0.208    -23.79606    109.3456
         31  |   30.00139   34.81723     0.86   0.389    -38.23913     98.2419
             |
       _cons |   37.96497   24.04015     1.58   0.114    -9.152858     85.0828
------------------------------------------------------------------------------

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Dependent 2001-2008.log
  log type:  text
 closed on:   8 Jul 2012, 20:11:13
```

Appendix K: Environment as the Independent Variable 2001-2008

```
----------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Independent 2001-2008.log
  log type:  text
 opened on:   8 Jul 2012, 20:11:33

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2008
                delta:  1 unit

. xi: reg env revtot i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   72.12
       Model |  12841.6302    31  414.246137           Prob > F      =  0.0000
    Residual |  1240.63955   216  5.74370163           R-squared     =  0.9119
-------------+------------------------------           Adj R-squared =  0.8993
       Total |  14082.2698   247   57.013238           Root MSE      =  2.3966

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         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |   .0105625   .0011707     9.02   0.000      .008255      .01287
    _Ifirm_2 |  -3.798479   1.936599    -1.96   0.051     -7.61553    .0185716
    _Ifirm_3 |   11.02855   1.199912     9.19   0.000     8.663515    13.39359
    _Ifirm_4 |   2.662632   1.203891     2.21   0.028     .2897546     5.03551
    _Ifirm_5 |   2.574619   1.227019     2.10   0.037     .1561549    4.993083
    _Ifirm_6 |   1.051125   1.604067     0.66   0.513    -2.110504    4.212753
    _Ifirm_7 |   5.471794   1.320054     4.15   0.000     2.869957    8.073631
    _Ifirm_8 |  -.0610913   1.199439    -0.05   0.959    -2.425195    2.303012
    _Ifirm_9 |    2.16599   1.205672     1.80   0.074    -.2103983    4.542379
   _Ifirm_10 |   1.901435    1.23687     1.54   0.126     -.536446    4.339315
   _Ifirm_11 |   1.593325   1.199785     1.33   0.186    -.7714613    3.958111
   _Ifirm_12 |   5.803707   2.732156     2.12   0.035      .418607    11.18881
   _Ifirm_13 |   7.533563    1.83506     4.11   0.000     3.916646    11.15048
   _Ifirm_14 |   2.112113   1.206709     1.75   0.081      -.26632    4.490546
   _Ifirm_15 |   .6310053   1.199919     0.53   0.600    -1.734044    2.996054
   _Ifirm_16 |   2.576445   1.198352     2.15   0.033     .2144845    4.938406
   _Ifirm_17 |   1.267971   1.510827     0.84   0.402    -1.709881    4.245823
   _Ifirm_18 |  -.0224183   1.198724    -0.02   0.985    -2.385112    2.340275
   _Ifirm_19 |  -1.771028   1.603066    -1.10   0.270    -4.930682    1.388627
   _Ifirm_20 |  -.8210586   1.198302    -0.69   0.494     -3.18292    1.540803
   _Ifirm_21 |  -3.107316   1.473004    -2.11   0.036    -6.010618   -.2040147
   _Ifirm_22 |   13.42673   1.909071     7.03   0.000     9.663932    17.18952
   _Ifirm_23 |   1.452233   1.230766     1.18   0.239    -.9736153    3.878082
   _Ifirm_24 |   3.828631   1.200217     3.19   0.002     1.462995    6.194268
   _Ifirm_25 |   4.490497    1.21341     3.70   0.000     2.098857    6.882137
   _Ifirm_26 |   10.22776   1.329993     7.69   0.000     7.606338    12.84919
   _Ifirm_27 |   2.928844   1.209732     2.42   0.016     .5444533    5.313235
   _Ifirm_28 |   5.136225   1.327439     3.87   0.000     2.519832    7.752617
   _Ifirm_29 |   3.285102   1.259991     2.61   0.010     .8016511    5.768554
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   _Ifirm_30 |   .8963129   1.199373     0.75   0.456    -1.467659    3.260285
   _Ifirm_31 |   3.619015   1.206164     3.00   0.003     1.241656    5.996374
       _cons |   .2111732   .8537226     0.25   0.805     -1.47152    1.893867
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
      revtot |     16.16    0.061864
   _Ifirm_12 |     10.06    0.099387
    _Ifirm_2 |      5.06    0.197817
   _Ifirm_22 |      4.91    0.203563
   _Ifirm_13 |      4.54    0.220314
    _Ifirm_6 |      3.47    0.288335
   _Ifirm_19 |      3.46    0.288695
   _Ifirm_17 |      3.08    0.325022
   _Ifirm_21 |      2.92    0.341928
   _Ifirm_26 |      2.38    0.419415
   _Ifirm_28 |      2.38    0.421030
    _Ifirm_7 |      2.35    0.425754
   _Ifirm_29 |      2.14    0.467313
   _Ifirm_10 |      2.06    0.484947
   _Ifirm_23 |      2.04    0.489769
    _Ifirm_5 |      2.03    0.492765
   _Ifirm_25 |      1.98    0.503880
   _Ifirm_27 |      1.97    0.506949
   _Ifirm_14 |      1.96    0.509492
   _Ifirm_31 |      1.96    0.509952
    _Ifirm_9 |      1.96    0.510369
    _Ifirm_4 |      1.95    0.511880
   _Ifirm_24 |      1.94    0.515018
   _Ifirm_15 |      1.94    0.515274
    _Ifirm_3 |      1.94    0.515280
   _Ifirm_11 |      1.94    0.515389
    _Ifirm_8 |      1.94    0.515687
   _Ifirm_30 |      1.94    0.515744
   _Ifirm_18 |      1.94    0.516302
   _Ifirm_16 |      1.94    0.516623
   _Ifirm_20 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      3.17

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =    99.62
         Prob > chi2  =   0.0000

. xtgls env revtot i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2567.00
Log likelihood             =  -551.531          Prob > chi2        =    0.0000

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         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |   .0105625   .0010926     9.67   0.000     .0084211    .0127039
             |
        firm |
          2  |  -3.798479   1.807344    -2.10   0.036    -7.340807    -.256151
          3  |   11.02855   1.119826     9.85   0.000     8.833733    13.22337
          4  |   2.662632   1.123539     2.37   0.018     .4605365    4.864728
          5  |   2.574619   1.145124     2.25   0.025     .3302177     4.81902
          6  |   1.051125   1.497006     0.70   0.483    -1.882954    3.985203
          7  |   5.471794   1.231949     4.44   0.000     3.057217     7.88637
          8  |  -.0610913   1.119384    -0.05   0.956    -2.255044    2.132862
          9  |    2.16599   1.125201     1.92   0.054    -.0393638    4.371344
         10  |   1.901435   1.154317     1.65   0.100    -.3609856    4.163855
         11  |   1.593325   1.119708     1.42   0.155    -.6012618    3.787911
         12  |   5.803707   2.549803     2.28   0.023      .806186    10.80123
         13  |   7.533563   1.712582     4.40   0.000     4.176964    10.89016
         14  |   2.112113   1.126169     1.88   0.061    -.0951383    4.319364
         15  |   .6310053   1.119832     0.56   0.573    -1.563825    2.825836
         16  |   2.576445    1.11837     2.30   0.021     .3844806     4.76841
         17  |   1.267971   1.409989     0.90   0.369    -1.495558      4.0315
         18  |  -.0224183   1.118717    -0.02   0.984    -2.215063    2.170226
         19  |  -1.771028   1.496072    -1.18   0.236    -4.703274    1.161219
         20  |  -.8210586   1.118323    -0.73   0.463    -3.012931    1.370814
         21  |  -3.107316   1.374691    -2.26   0.024     -5.80166   -.4129725
         22  |   13.42673   1.781653     7.54   0.000      9.93475     16.9187
         23  |   1.452233    1.14862     1.26   0.206    -.7990209    3.703487
         24  |   3.828631    1.12011     3.42   0.001     1.633255    6.024007
         25  |   4.490497   1.132423     3.97   0.000     2.270989    6.710005
         26  |   10.22776   1.241225     8.24   0.000     7.795008    12.66052
         27  |   2.928844    1.12899     2.59   0.009     .7160639    5.141625
         28  |   5.136225   1.238841     4.15   0.000     2.708141    7.564309
         29  |   3.285102   1.175895     2.79   0.005     .9803912    5.589813
         30  |   .8963129   1.119322     0.80   0.423    -1.297518    3.090144
         31  |   3.619015   1.125661     3.22   0.001      1.41276     5.82527
             |
       _cons |   .2111732   .7967422     0.27   0.791    -1.350413    1.772759
------------------------------------------------------------------------------

.
. xi: reg env cos i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   70.94
       Model |  12822.7645    31  413.637564           Prob > F      =  0.0000
    Residual |   1259.5053   216  5.83104305           R-squared     =  0.9106
-------------+------------------------------           Adj R-squared =  0.8977
       Total |  14082.2698   247   57.013238           Root MSE      =  2.4148

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         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
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cos	.0126546	.0014426	8.77	0.000	.0098112	.015498
_Ifirm_2	-1.406325	1.768383	-0.80	0.427	-4.89182	2.079171
_Ifirm_3	10.97509	1.208762	9.08	0.000	8.592614	13.35757
_Ifirm_4	2.960071	1.210385	2.45	0.015	.5743921	5.34575
_Ifirm_5	3.091654	1.225936	2.52	0.012	.6753244	5.507983
_Ifirm_6	2.156223	1.549265	1.39	0.165	-.8973895	5.209836
_Ifirm_7	6.35812	1.295086	4.91	0.000	3.805496	8.910744
_Ifirm_8	-.1543357	1.208147	-0.13	0.898	-2.535602	2.22693
_Ifirm_9	2.454973	1.211846	2.03	0.044	.0664155	4.84353
_Ifirm_10	2.549154	1.231269	2.07	0.040	.1223141	4.975994
_Ifirm_11	1.738489	1.208209	1.44	0.152	-.6429005	4.119878
_Ifirm_12	8.477511	2.527625	3.35	0.001	3.495543	13.45948
_Ifirm_13	8.627818	1.777648	4.85	0.000	5.124061	12.13157
_Ifirm_14	2.46237	1.212051	2.03	0.043	.0734081	4.851331
_Ifirm_15	.737907	1.208492	0.61	0.542	-1.644039	3.119853
_Ifirm_16	2.609008	1.207402	2.16	0.032	.2292102	4.988806
_Ifirm_17	2.718654	1.437975	1.89	0.060	-.1156052	5.552914
_Ifirm_18	-.0398186	1.207769	-0.03	0.974	-2.420341	2.340704
_Ifirm_19	.6398252	1.459732	0.44	0.662	-2.237317	3.516967
_Ifirm_20	-.7966034	1.207384	-0.66	0.510	-3.176366	1.58316
_Ifirm_21	-2.743694	1.470623	-1.87	0.063	-5.642302	.1549141
_Ifirm_22	16.00269	1.727061	9.27	0.000	12.59864	19.40674
_Ifirm_23	2.030707	1.227778	1.65	0.100	-.3892534	4.450667
_Ifirm_24	3.997274	1.208433	3.31	0.001	1.615443	6.379105
_Ifirm_25	5.055588	1.214563	4.16	0.000	2.661676	7.4495
_Ifirm_26	10.80615	1.317603	8.20	0.000	8.209144	13.40315
_Ifirm_27	3.08716	1.216983	2.54	0.012	.6884775	5.485842
_Ifirm_28	5.614407	1.319751	4.25	0.000	3.013168	8.215645
_Ifirm_29	4.012539	1.248454	3.21	0.002	1.551827	6.473251
_Ifirm_30	1.18337	1.207534	0.98	0.328	-1.196687	3.563428
_Ifirm_31	3.776742	1.213672	3.11	0.002	1.384585	6.168899
_cons	.3503983	.8586246	0.41	0.684	-1.341957	2.042754

. vif

Variable	VIF	1/VIF
cos	12.89	0.077583
_Ifirm_12	8.48	0.117889
_Ifirm_13	4.20	0.238345
_Ifirm_2	4.15	0.240849
_Ifirm_22	3.96	0.252511
_Ifirm_6	3.19	0.313794
_Ifirm_21	2.87	0.348253
_Ifirm_19	2.83	0.353469
_Ifirm_17	2.75	0.364245
_Ifirm_28	2.31	0.432427
_Ifirm_26	2.31	0.433838
_Ifirm_7	2.23	0.449055
_Ifirm_29	2.07	0.483227
_Ifirm_10	2.01	0.496811
_Ifirm_23	2.00	0.499640
_Ifirm_5	2.00	0.501142
_Ifirm_27	1.97	0.508543
_Ifirm_25	1.96	0.510572
_Ifirm_31	1.96	0.511321
_Ifirm_14	1.95	0.512690
_Ifirm_9	1.95	0.512864
_Ifirm_4	1.95	0.514102

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    _Ifirm_3 |      1.94    0.515484
   _Ifirm_15 |      1.94    0.515714
   _Ifirm_24 |      1.94    0.515764
   _Ifirm_11 |      1.94    0.515956
    _Ifirm_8 |      1.94    0.516009
   _Ifirm_18 |      1.94    0.516332
   _Ifirm_30 |      1.94    0.516533
   _Ifirm_16 |      1.94    0.516646
   _Ifirm_20 |      1.94    0.516661
-------------+----------------------
    Mean VIF |      2.88

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   109.58
         Prob > chi2  =   0.0000

. xtgls env cos i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2524.84
Log likelihood             = -553.4024          Prob > chi2        =    0.0000

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         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cos |   .0126546   .0013463     9.40   0.000     .0100158    .0152933
             |
        firm |
          2  |  -1.406325   1.650355    -0.85   0.394    -4.640961    1.828311
          3  |   10.97509   1.128085     9.73   0.000     8.764087     13.1861
          4  |   2.960071     1.1296     2.62   0.009     .7460953    5.174047
          5  |   3.091654   1.144113     2.70   0.007     .8492336    5.334073
          6  |   2.156223   1.445862     1.49   0.136    -.6776134     4.99006
          7  |    6.35812   1.208647     5.26   0.000     3.989215    8.727025
          8  |  -.1543357   1.127511    -0.14   0.891    -2.364216    2.055544
          9  |   2.454973   1.130963     2.17   0.030     .2383259     4.67162
         10  |   2.549154    1.14909     2.22   0.027     .2969798    4.801328
         11  |   1.738489   1.127569     1.54   0.123     -.471506    3.948484
         12  |   8.477511   2.358922     3.59   0.000     3.854108    13.10091
         13  |   8.627818   1.659001     5.20   0.000     5.376235     11.8794
         14  |    2.46237   1.131154     2.18   0.029     .2453476    4.679392
         15  |    .737907   1.127833     0.65   0.513    -1.472605    2.948419
         16  |   2.609008   1.126816     2.32   0.021     .4004901    4.817526
         17  |   2.718654      1.342     2.03   0.043     .0883835    5.348925
         18  |  -.0398186   1.127159    -0.04   0.972    -2.249009    2.169372
         19  |   .6398252   1.362304     0.47   0.639    -2.030242    3.309892
         20  |  -.7966034   1.126799    -0.71   0.480    -3.005089    1.411882
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          21 |  -2.743694   1.372468    -2.00   0.046    -5.433682   -.0537059
          22 |   16.00269   1.611791     9.93   0.000     12.84364    19.16174
          23 |   2.030707   1.145832     1.77   0.076    -.2150828    4.276496
          24 |   3.997274   1.127778     3.54   0.000     1.786869    6.207678
          25 |   5.055588   1.133499     4.46   0.000     2.833972    7.277204
          26 |   10.80615   1.229661     8.79   0.000     8.396056    13.21624
          27 |    3.08716   1.135757     2.72   0.007     .8611166    5.313202
          28 |   5.614407   1.231666     4.56   0.000     3.200386    8.028428
          29 |   4.012539   1.165128     3.44   0.001      1.72893    6.296148
          30 |    1.18337   1.126939     1.05   0.294    -1.025389     3.39213
          31 |   3.776742   1.132667     3.33   0.001     1.556755     5.99673
             |
       _cons |   .3503983    .801317     0.44   0.662    -1.220154    1.920951
------------------------------------------------------------------------------

.
. xi: reg env ni i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   61.22
       Model |  12643.3678    31  407.850575           Prob > F      =  0.0000
    Residual |  1438.90197   216   6.6615832           R-squared     =  0.8978
-------------+------------------------------           Adj R-squared =  0.8832
       Total |  14082.2698   247   57.013238           Root MSE      =   2.581

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |   .0576215   .0090628     6.36   0.000     .0397587    .0754844
    _Ifirm_2 |   8.448517   1.311303     6.44   0.000     5.863929     11.0331
    _Ifirm_3 |   10.72164    1.29112     8.30   0.000     8.176838    13.26645
    _Ifirm_4 |   3.459647   1.291094     2.68   0.008     .9148911    6.004402
    _Ifirm_5 |    4.74067   1.290945     3.67   0.000     2.196207    7.285134
    _Ifirm_6 |   10.26154   1.292117     7.94   0.000     7.714771    12.80831
    _Ifirm_7 |   9.592061   1.297831     7.39   0.000     7.034027     12.1501
    _Ifirm_8 |  -.2681444   1.291171    -0.21   0.836    -2.813052    2.276764
    _Ifirm_9 |   3.143983   1.290979     2.44   0.016     .5994543    5.688512
   _Ifirm_10 |   4.110207   1.293465     3.18   0.002     1.560779    6.659636
   _Ifirm_11 |   2.200656   1.290548     1.71   0.090    -.3430238    4.744335
   _Ifirm_12 |   25.22927   1.359934    18.55   0.000     22.54883    27.90971
   _Ifirm_13 |   18.88844   1.303876    14.49   0.000     16.31849    21.45839
   _Ifirm_14 |   3.353054   1.290519     2.60   0.010     .8094312    5.896677
   _Ifirm_15 |    1.20335   1.290503     0.93   0.352    -1.340241    3.746942
   _Ifirm_16 |   2.790806   1.290628     2.16   0.032     .2469684    5.334644
   _Ifirm_17 |   9.747032   1.290803     7.55   0.000      7.20285    12.29121
   _Ifirm_18 |  -.1149219   1.290865    -0.09   0.929    -2.659227    2.429383
   _Ifirm_19 |    2.17424   1.567952     1.39   0.167    -.9162056    5.264686
   _Ifirm_20 |  -.8005825   1.290511    -0.62   0.536     -3.34419    1.743025
   _Ifirm_21 |   4.361094   1.291152     3.38   0.001     1.816224    6.905964
   _Ifirm_22 |   23.94497   1.368227    17.50   0.000     21.24818    26.64176
   _Ifirm_23 |   3.689225   1.291345     2.86   0.005     1.143974    6.234476
   _Ifirm_24 |    4.49785   1.290534     3.49   0.001     1.954198    7.041502
   _Ifirm_25 |   5.958747    1.29112     4.62   0.000     3.413939    8.503555
   _Ifirm_26 |   14.77002   1.294719    11.41   0.000     12.21812    17.32192
   _Ifirm_27 |   4.471876   1.290523     3.47   0.001     1.928246    7.015506
   _Ifirm_28 |   10.04305   1.291082     7.78   0.000     7.498318    12.58778
   _Ifirm_29 |   6.089837   1.295308     4.70   0.000     3.536775    8.642899
   _Ifirm_30 |   1.339861   1.290504     1.04   0.300    -1.203732    3.883454
   _Ifirm_31 |   4.611341   1.291093     3.57   0.000     2.066587    7.156095
```

```
       _cons |   .8603682   .9136769     0.94   0.347    -.9404957    2.661232
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
   _Ifirm_19 |      2.86    0.349995
          ni |      2.30    0.433865
   _Ifirm_22 |      2.18    0.459633
   _Ifirm_12 |      2.15    0.465256
    _Ifirm_2 |      2.00    0.500405
   _Ifirm_13 |      1.98    0.506122
    _Ifirm_7 |      1.96    0.510848
   _Ifirm_29 |      1.95    0.512840
   _Ifirm_26 |      1.95    0.513306
   _Ifirm_10 |      1.94    0.514303
    _Ifirm_6 |      1.94    0.515376
   _Ifirm_23 |      1.94    0.515992
    _Ifirm_8 |      1.94    0.516131
   _Ifirm_21 |      1.94    0.516147
   _Ifirm_25 |      1.94    0.516172
    _Ifirm_3 |      1.94    0.516172
    _Ifirm_4 |      1.94    0.516193
   _Ifirm_31 |      1.94    0.516194
   _Ifirm_28 |      1.94    0.516203
    _Ifirm_9 |      1.94    0.516285
    _Ifirm_5 |      1.94    0.516312
   _Ifirm_18 |      1.94    0.516376
   _Ifirm_17 |      1.94    0.516426
   _Ifirm_16 |      1.94    0.516566
   _Ifirm_11 |      1.94    0.516630
   _Ifirm_24 |      1.94    0.516641
   _Ifirm_27 |      1.94    0.516650
   _Ifirm_14 |      1.94    0.516653
   _Ifirm_20 |      1.94    0.516659
   _Ifirm_30 |      1.94    0.516665
   _Ifirm_15 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      2.00

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   107.70
         Prob > chi2  =   0.0000

. xtgls env ni i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
```

```
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2179.13
Log likelihood             = -569.9144          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |   .0576215   .0084579     6.81   0.000     .0410443    .0741987
             |
        firm |
          2  |   8.448517   1.223782     6.90   0.000     6.049948    10.84709
          3  |   10.72164   1.204946     8.90   0.000     8.359994     13.0833
          4  |   3.459647   1.204922     2.87   0.004     1.098043     5.82125
          5  |    4.74067   1.204783     3.93   0.000     2.379339    7.102002
          6  |   10.26154   1.205876     8.51   0.000     7.898068    12.62502
          7  |   9.592061   1.211209     7.92   0.000     7.218135    11.96599
          8  |  -.2681444   1.204994    -0.22   0.824    -2.629889      2.0936
          9  |   3.143983   1.204814     2.61   0.009     .7825904    5.505376
         10  |   4.110207   1.207134     3.40   0.001     1.744267    6.476147
         11  |   2.200656   1.204412     1.83   0.068    -.1599489     4.56126
         12  |   25.22927   1.269168    19.88   0.000     22.74175    27.71679
         13  |   18.88844   1.216851    15.52   0.000     16.50346    21.27342
         14  |   3.353054   1.204385     2.78   0.005     .9925021    5.713606
         15  |    1.20335   1.204371     1.00   0.318    -1.157173    3.563873
         16  |   2.790806   1.204487     2.32   0.021     .4300547    5.151558
         17  |   9.747032    1.20465     8.09   0.000     7.385961     12.1081
         18  |  -.1149219   1.204709    -0.10   0.924    -2.476107    2.246264
         19  |    2.17424   1.463302     1.49   0.137    -.6937786    5.042258
         20  |  -.8005825   1.204378    -0.66   0.506     -3.16112    1.559955
         21  |   4.361094   1.204976     3.62   0.000     1.999384    6.722803
         22  |   23.94497   1.276907    18.75   0.000     21.44228    26.44766
         23  |   3.689225   1.205156     3.06   0.002     1.327162    6.051288
         24  |    4.49785   1.204399     3.73   0.000     2.137271    6.858429
         25  |   5.958747   1.204947     4.95   0.000     3.597095    8.320399
         26  |   14.77002   1.208305    12.22   0.000     12.40178    17.13825
         27  |   4.471876   1.204389     3.71   0.000     2.111318    6.832434
         28  |   10.04305   1.204911     8.34   0.000     7.681469    12.40463
         29  |   6.089837   1.208855     5.04   0.000     3.720525    8.459149
         30  |   1.339861   1.204371     1.11   0.266    -1.020664    3.700385
         31  |   4.611341   1.204921     3.83   0.000      2.24974    6.972942
             |
       _cons |   .8603682   .8526949     1.01   0.313    -.8108831     2.53162
------------------------------------------------------------------------------

.
. xi: reg env curra i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   64.08
       Model |  12701.1851    31  409.715647           Prob > F      =  0.0000
    Residual |  1381.08472   216  6.39391076           R-squared     =  0.9019
-------------+------------------------------           Adj R-squared =  0.8879
       Total |  14082.2698   247   57.013238           Root MSE      =  2.5286

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0201445   .0028164     7.15   0.000     .0145934    .0256957
    _Ifirm_2 |  -1.549048   2.042807    -0.76   0.449    -5.575437     2.47734
```

_Ifirm_3	10.97407	1.266289	8.67	0.000	8.478209	13.46994
_Ifirm_4	2.86485	1.269794	2.26	0.025	.3620761	5.367624
_Ifirm_5	2.637138	1.305205	2.02	0.045	.0645693	5.209707
_Ifirm_6	3.182055	1.641668	1.94	0.054	-.0536853	6.417795
_Ifirm_7	6.801258	1.364276	4.99	0.000	4.112261	9.490256
_Ifirm_8	-.0586388	1.266043	-0.05	0.963	-2.554019	2.436741
_Ifirm_9	1.990464	1.278873	1.56	0.121	-.5302036	4.511132
_Ifirm_10	1.739272	1.328897	1.31	0.192	-.8799941	4.358538
_Ifirm_11	1.798928	1.265165	1.42	0.156	-.6947205	4.292577
_Ifirm_12	8.800041	2.961713	2.97	0.003	2.962483	14.6376
_Ifirm_13	9.820727	1.911262	5.14	0.000	6.053616	13.58784
_Ifirm_14	1.887809	1.281752	1.47	0.142	-.6385339	4.414151
_Ifirm_15	.798321	1.265513	0.63	0.529	-1.696014	3.292656
_Ifirm_16	2.492304	1.26457	1.97	0.050	-.0001739	4.984781
_Ifirm_17	4.537832	1.446869	3.14	0.002	1.686042	7.389622
_Ifirm_18	-.1696281	1.264461	-0.13	0.893	-2.66189	2.322633
_Ifirm_19	-7.762439	2.520845	-3.08	0.002	-12.73104	-2.793835
_Ifirm_20	-.9419136	1.264404	-0.74	0.457	-3.434063	1.550236
_Ifirm_21	-.5446304	1.456077	-0.37	0.709	-3.414569	2.325308
_Ifirm_22	12.56901	2.361514	5.32	0.000	7.91445	17.22357
_Ifirm_23	2.034997	1.293395	1.57	0.117	-.5142952	4.584288
_Ifirm_24	3.948439	1.266178	3.12	0.002	1.452794	6.444085
_Ifirm_25	4.481394	1.287273	3.48	0.001	1.94417	7.018618
_Ifirm_26	10.9316	1.412338	7.74	0.000	8.147875	13.71533
_Ifirm_27	2.633996	1.288887	2.04	0.042	.0935892	5.174402
_Ifirm_28	5.664118	1.420061	3.99	0.000	2.865166	8.463069
_Ifirm_29	3.832888	1.330565	2.88	0.004	1.210335	6.455442
_Ifirm_30	.4322423	1.270855	0.34	0.734	-2.072622	2.937107
_Ifirm_31	3.559941	1.2773	2.79	0.006	1.042373	6.077509
_cons	.0693637	.9067305	0.08	0.939	-1.717809	1.856536

. vif

Variable	VIF	1/VIF
curra	20.09	0.049764
_Ifirm_12	10.62	0.094152
_Ifirm_19	7.69	0.129965
_Ifirm_22	6.75	0.148094
_Ifirm_2	5.05	0.197907
_Ifirm_13	4.42	0.226088
_Ifirm_6	3.26	0.306441
_Ifirm_21	2.57	0.389537
_Ifirm_17	2.53	0.394510
_Ifirm_28	2.44	0.409546
_Ifirm_26	2.42	0.414037
_Ifirm_7	2.25	0.443724
_Ifirm_29	2.14	0.466493
_Ifirm_10	2.14	0.467664
_Ifirm_5	2.06	0.484797
_Ifirm_23	2.03	0.493690
_Ifirm_27	2.01	0.497150
_Ifirm_25	2.01	0.498398
_Ifirm_14	1.99	0.502700
_Ifirm_9	1.98	0.504966
_Ifirm_31	1.98	0.506210
_Ifirm_30	1.96	0.511358
_Ifirm_4	1.95	0.512213
_Ifirm_3	1.94	0.515052

```
   _Ifirm_24 |      1.94    0.515143
    _Ifirm_8 |      1.94    0.515253
   _Ifirm_15 |      1.94    0.515684
   _Ifirm_11 |      1.94    0.515968
   _Ifirm_16 |      1.94    0.516453
   _Ifirm_18 |      1.94    0.516543
   _Ifirm_20 |      1.94    0.516589
-------------+----------------------
    Mean VIF |      3.48

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =    95.91
         Prob > chi2  =   0.0000

. xtgls env curra i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2280.74
Log likelihood             =  -564.829          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0201445   .0026284     7.66   0.000     .0149929    .0252961
             |
        firm |
          2  |  -1.549048   1.906463    -0.81   0.416    -5.285648    2.187551
          3  |   10.97407   1.181773     9.29   0.000     8.657843    13.29031
          4  |    2.86485   1.185044     2.42   0.016     .5422069    5.187493
          5  |   2.637138   1.218091     2.16   0.030     .2497235    5.024553
          6  |   3.182055   1.532098     2.08   0.038      .179199    6.184911
          7  |   6.801258   1.273219     5.34   0.000     4.305795    9.296722
          8  |  -.0586388   1.181543    -0.05   0.960     -2.37442    2.257142
          9  |   1.990464   1.193516     1.67   0.095    -.3487849    4.329714
         10  |   1.739272   1.240202     1.40   0.161     -.691479    4.170023
         11  |   1.798928   1.180723     1.52   0.128    -.5152465    4.113103
         12  |   8.800041   2.764038     3.18   0.001     3.382626    14.21746
         13  |   9.820727   1.783697     5.51   0.000     6.324744    13.31671
         14  |   1.887809   1.196203     1.58   0.115    -.4567068    4.232324
         15  |    .798321   1.181048     0.68   0.499    -1.516491    3.113133
         16  |   2.492304   1.180169     2.11   0.035     .1792159    4.805392
         17  |   4.537832     1.3503     3.36   0.001     1.891292    7.184371
         18  |  -.1696281   1.180066    -0.14   0.886    -2.482515    2.143259
         19  |  -7.762439   2.352595    -3.30   0.001    -12.37344   -3.151438
         20  |  -.9419136   1.180013    -0.80   0.425    -3.254697     1.37087
         21  |  -.5446304   1.358893    -0.40   0.689    -3.208012    2.118751
         22  |   12.56901   2.203898     5.70   0.000      8.24945    16.88857
```

```
          23  |   2.034997    1.20707     1.69   0.092    -.3308163    4.400809
          24  |   3.948439   1.181668     3.34   0.001     1.632412    6.264467
          25  |   4.481394   1.201356     3.73   0.000      2.12678    6.836008
          26  |    10.9316   1.318074     8.29   0.000     8.348227    13.51498
          27  |   2.633996   1.202862     2.19   0.029     .2764286    4.991563
          28  |   5.664118   1.325281     4.27   0.000     3.066614    8.261622
          29  |   3.832888   1.241758     3.09   0.002     1.399086     6.26669
          30  |   .4322423   1.186034     0.36   0.716    -1.892341    2.756825
          31  |   3.559941   1.192049     2.99   0.003     1.223568    5.896313
              |
       _cons  |   .0693637   .8462122     0.08   0.935    -1.589182    1.727909
------------------------------------------------------------------------------

.
. xi: reg env asset i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   60.63
       Model |  12630.7737    31  407.444313           Prob > F      =  0.0000
    Residual |  1451.49609   216  6.71988929           R-squared     =  0.8969
-------------+------------------------------           Adj R-squared =  0.8821
       Total |  14082.2698   247   57.013238           Root MSE      =  2.5923

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0097347    .001575     6.18   0.000     .0066302    .0128391
    _Ifirm_2 |  -1.990494   2.323442    -0.86   0.393    -6.570015    2.589026
    _Ifirm_3 |   10.66674   1.296537     8.23   0.000     8.111258    13.22223
    _Ifirm_4 |   2.217595   1.318382     1.68   0.094    -.3809469    4.816136
    _Ifirm_5 |   1.371617    1.41995     0.97   0.335    -1.427116     4.17035
    _Ifirm_6 |   1.402143   1.982307     0.71   0.480    -2.504999    5.309285
    _Ifirm_7 |   7.023904   1.410833     4.98   0.000     4.243143    9.804666
    _Ifirm_8 |  -.1805898   1.297387    -0.14   0.889    -2.737748    2.376569
    _Ifirm_9 |    1.84616   1.319288     1.40   0.163    -.7541675    4.446487
   _Ifirm_10 |   .8410728   1.436337     0.59   0.559    -1.989957    3.672103
   _Ifirm_11 |   1.113697   1.306559     0.85   0.395    -1.461542    3.688935
   _Ifirm_12 |   7.353939   3.576595     2.06   0.041     .3044436    14.40343
   _Ifirm_13 |   8.031056   2.340062     3.43   0.001     3.418776    12.64334
   _Ifirm_14 |   1.787599   1.321976     1.35   0.178    -.8180262    4.393223
   _Ifirm_15 |   .1699051   1.306665     0.13   0.897    -2.405542    2.745352
   _Ifirm_16 |   2.206025   1.298367     1.70   0.091    -.3530669    4.765116
   _Ifirm_17 |   2.491972   1.729572     1.44   0.151    -.9170281    5.900971
   _Ifirm_18 |  -.3168798   1.296138    -0.24   0.807    -2.871577    2.237818
   _Ifirm_19 |  -6.212906   2.616698    -2.37   0.018    -11.37044   -1.055375
   _Ifirm_20 |  -.9303806   1.296237    -0.72   0.474    -3.485273    1.624512
   _Ifirm_21 |  -4.243475   1.933201    -2.20   0.029     -8.05383   -.4331207
   _Ifirm_22 |   10.08978    3.00344     3.36   0.001     4.169979    16.00958
   _Ifirm_23 |   1.020967   1.382063     0.74   0.461    -1.703089    3.745023
   _Ifirm_24 |    3.47966   1.305423     2.67   0.008     .9066627    6.052658
   _Ifirm_25 |    3.60734   1.362965     2.65   0.009      .920925    6.293755
   _Ifirm_26 |   10.06005   1.560753     6.45   0.000     6.983791     13.1363
   _Ifirm_27 |   2.420945    1.33611     1.81   0.071    -.2125378    5.054427
   _Ifirm_28 |   3.891189   1.658765     2.35   0.020     .6217502    7.160628
   _Ifirm_29 |   3.530077   1.399874     2.52   0.012     .7709153    6.289238
   _Ifirm_30 |   .2766451   1.307798     0.21   0.833    -2.301035    2.854325
   _Ifirm_31 |   3.054549   1.328634     2.30   0.022     .4358013    5.673298
       _cons |   .3836837   .9249052     0.41   0.679    -1.439311    2.206679
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
       asset |     28.55    0.035022
   _Ifirm_12 |     14.74    0.067854
   _Ifirm_22 |     10.39    0.096222
   _Ifirm_19 |      7.89    0.126767
   _Ifirm_13 |      6.31    0.158510
    _Ifirm_2 |      6.22    0.160786
    _Ifirm_6 |      4.53    0.220887
   _Ifirm_21 |      4.31    0.232251
   _Ifirm_17 |      3.45    0.290158
   _Ifirm_28 |      3.17    0.315459
   _Ifirm_26 |      2.81    0.356323
   _Ifirm_10 |      2.38    0.420727
    _Ifirm_5 |      2.32    0.430493
    _Ifirm_7 |      2.29    0.436075
   _Ifirm_29 |      2.26    0.442930
   _Ifirm_23 |      2.20    0.454420
   _Ifirm_25 |      2.14    0.467243
   _Ifirm_27 |      2.06    0.486215
   _Ifirm_31 |      2.03    0.491702
   _Ifirm_14 |      2.01    0.496667
    _Ifirm_9 |      2.01    0.498693
    _Ifirm_4 |      2.00    0.499378
   _Ifirm_30 |      1.97    0.507494
   _Ifirm_15 |      1.97    0.508375
   _Ifirm_11 |      1.97    0.508457
   _Ifirm_24 |      1.96    0.509343
   _Ifirm_16 |      1.94    0.514894
    _Ifirm_8 |      1.94    0.515672
    _Ifirm_3 |      1.94    0.516348
   _Ifirm_20 |      1.94    0.516587
   _Ifirm_18 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      4.31

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =    98.42
         Prob > chi2  =   0.0000

. xtgls env asset i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2158.07
```

```
Log likelihood             =  -570.995         Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0097347   .0014699     6.62   0.000     .0068537    .0126156
             |
        firm |
          2  |  -1.990494   2.168367    -0.92   0.359    -6.240416    2.259427
          3  |   10.66674   1.210002     8.82   0.000     8.295182     13.0383
          4  |   2.217595   1.230389     1.80   0.071    -.1939234    4.629113
          5  |   1.371617   1.325178     1.04   0.301    -1.225684    3.968918
          6  |   1.402143   1.850001     0.76   0.449    -2.223792    5.028079
          7  |   7.023904   1.316669     5.33   0.000     4.443281    9.604528
          8  |  -.1805898   1.210795    -0.15   0.881    -2.553703    2.192524
          9  |    1.84616   1.231234     1.50   0.134    -.5670155    4.259335
         10  |   .8410728   1.340471     0.63   0.530    -1.786201    3.468347
         11  |   1.113697   1.219355     0.91   0.361    -1.276195    3.503589
         12  |   7.353939   3.337881     2.20   0.028     .8118133    13.89606
         13  |   8.031056   2.183878     3.68   0.000     3.750733    12.31138
         14  |   1.787599   1.233743     1.45   0.147    -.6304929     4.20569
         15  |   .1699051   1.219454     0.14   0.889     -2.22018    2.559991
         16  |   2.206025    1.21171     1.82   0.069    -.1688827    4.580932
         17  |   2.491972   1.614134     1.54   0.123    -.6716739    5.655617
         18  |  -.3168798   1.209629    -0.26   0.793     -2.68771     2.05395
         19  |  -6.212906    2.44205    -2.54   0.011    -10.99924   -1.426575
         20  |  -.9303806   1.209721    -0.77   0.442    -3.301391     1.44063
         21  |  -4.243475   1.804173    -2.35   0.019    -7.779589   -.7073614
         22  |   10.08978    2.80298     3.60   0.000     4.596041    15.58352
         23  |   1.020967   1.289819     0.79   0.429    -1.507032    3.548966
         24  |    3.47966   1.218294     2.86   0.004     1.091848    5.867473
         25  |    3.60734   1.271996     2.84   0.005     1.114273    6.100407
         26  |   10.06005   1.456583     6.91   0.000     7.205197     12.9149
         27  |   2.420945   1.246933     1.94   0.052    -.0229995    4.864889
         28  |   3.891189   1.548054     2.51   0.012     .8570598    6.925318
         29  |   3.530077   1.306441     2.70   0.007      .969499    6.090654
         30  |   .2766451   1.220511     0.23   0.821    -2.115513    2.668803
         31  |   3.054549   1.239957     2.46   0.014     .6242791     5.48482
             |
       _cons |   .3836837   .8631738     0.44   0.657    -1.308106    2.075473
------------------------------------------------------------------------------

.
. xi: reg env currl i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   53.85
       Model |  12468.8344    31  402.220464           Prob > F      =  0.0000
    Residual |  1613.43539   216  7.46960828           R-squared     =  0.8854
-------------+------------------------------           Adj R-squared =  0.8690
       Total |  14082.2698   247   57.013238           Root MSE      =  2.7331

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0182182    .005115     3.56   0.000     .0081365       .0283
    _Ifirm_2 |    2.55834   2.479576     1.03   0.303    -2.328923    7.445604
    _Ifirm_3 |   10.71123   1.368238     7.83   0.000     8.014425    13.40804
    _Ifirm_4 |   2.710219   1.394956     1.94   0.053    -.0392492    5.459686
```

_Ifirm_5	3.045399	1.46802	2.07	0.039	.1519208	5.938877
_Ifirm_6	2.945002	2.564008	1.15	0.252	-2.108677	7.998681
_Ifirm_7	7.884103	1.547127	5.10	0.000	4.834704	10.9335
_Ifirm_8	-.4551388	1.366701	-0.33	0.739	-3.148917	2.23864
_Ifirm_9	2.528248	1.386672	1.82	0.070	-.2048921	5.261388
_Ifirm_10	3.401084	1.411959	2.41	0.017	.6181018	6.184066
_Ifirm_11	1.405799	1.381641	1.02	0.310	-1.317425	4.129023
_Ifirm_12	10.85775	4.991492	2.18	0.031	1.01948	20.69602
_Ifirm_13	11.35055	2.804359	4.05	0.000	5.823139	16.87796
_Ifirm_14	2.099835	1.414093	1.48	0.139	-.6873523	4.887023
_Ifirm_15	.5311154	1.379107	0.39	0.701	-2.187115	3.249346
_Ifirm_16	2.598012	1.366705	1.90	0.059	-.0957741	5.291798
_Ifirm_17	4.320385	2.009899	2.15	0.033	.3588589	8.281911
_Ifirm_18	-.3871664	1.366703	-0.28	0.777	-3.080947	2.306615
_Ifirm_19	1.916738	2.151679	0.89	0.374	-2.324237	6.157714
_Ifirm_20	-.9964239	1.367316	-0.73	0.467	-3.691415	1.698567
_Ifirm_21	-2.379863	2.394057	-0.99	0.321	-7.098567	2.338842
_Ifirm_22	16.43833	3.223114	5.10	0.000	10.08555	22.79111
_Ifirm_23	2.167642	1.458769	1.49	0.139	-.7076024	5.042887
_Ifirm_24	3.948888	1.373475	2.88	0.004	1.241758	6.656018
_Ifirm_25	4.760979	1.426024	3.34	0.001	1.950276	7.571683
_Ifirm_26	10.52625	1.940611	5.42	0.000	6.701297	14.35121
_Ifirm_27	3.110042	1.415578	2.20	0.029	.3199274	5.900157
_Ifirm_28	4.603338	2.101351	2.19	0.030	.4615591	8.745117
_Ifirm_29	5.005256	1.456341	3.44	0.001	2.134797	7.875714
_Ifirm_30	1.080841	1.368674	0.79	0.431	-1.616825	3.778507
_Ifirm_31	3.928953	1.391287	2.82	0.005	1.186716	6.67119
_cons	.7037215	.9744535	0.72	0.471	-1.216934	2.624377

. vif

Variable	VIF	1/VIF
currl	41.02	0.024381
_Ifirm_12	25.82	0.038725
_Ifirm_22	10.77	0.092875
_Ifirm_13	8.15	0.122682
_Ifirm_6	6.81	0.146761
_Ifirm_2	6.37	0.156925
_Ifirm_21	5.94	0.168337
_Ifirm_19	4.80	0.208398
_Ifirm_28	4.58	0.218500
_Ifirm_17	4.19	0.238836
_Ifirm_26	3.90	0.256196
_Ifirm_7	2.48	0.403085
_Ifirm_5	2.23	0.447697
_Ifirm_23	2.21	0.453393
_Ifirm_29	2.20	0.454907
_Ifirm_25	2.11	0.474455
_Ifirm_27	2.08	0.481483
_Ifirm_14	2.07	0.482495
_Ifirm_10	2.07	0.483954
_Ifirm_4	2.02	0.495824
_Ifirm_31	2.01	0.498442
_Ifirm_9	1.99	0.501766
_Ifirm_11	1.98	0.505427
_Ifirm_15	1.97	0.507285
_Ifirm_24	1.96	0.511454
_Ifirm_30	1.94	0.515049

```
    _Ifirm_3 |      1.94    0.515377
   _Ifirm_20 |      1.94    0.516072
   _Ifirm_16 |      1.94    0.516534
   _Ifirm_18 |      1.94    0.516536
    _Ifirm_8 |      1.94    0.516537
-------------+----------------------
    Mean VIF |      5.27

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   114.20
         Prob > chi2  =   0.0000

. xtgls env currl i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   1916.58
Log likelihood             = -584.1106          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0182182   .0047736     3.82   0.000     .0088621    .0275744
             |
        firm |
          2  |    2.55834   2.314081     1.11   0.269    -1.977175    7.093855
          3  |   10.71123   1.276917     8.39   0.000     8.208521    13.21394
          4  |   2.710219   1.301851     2.08   0.037     .1586368      5.2618
          5  |   3.045399   1.370039     2.22   0.026     .3601716    5.730627
          6  |   2.945002   2.392877     1.23   0.218    -1.744951    7.634955
          7  |   7.884103   1.443866     5.46   0.000     5.054177    10.71403
          8  |  -.4551388   1.275483    -0.36   0.721    -2.955039    2.044762
          9  |   2.528248    1.29412     1.95   0.051    -.0081812    5.064678
         10  |   3.401084    1.31772     2.58   0.010     .8183999    5.983768
         11  |   1.405799   1.289425     1.09   0.276    -1.121428    3.933026
         12  |   10.85775   4.658343     2.33   0.020     1.727564    19.98793
         13  |   11.35055   2.617186     4.34   0.000      6.22096    16.48014
         14  |   2.099835   1.319711     1.59   0.112    -.4867515    4.686422
         15  |   .5311154   1.287061     0.41   0.680    -1.991477    3.053708
         16  |   2.598012   1.275487     2.04   0.042     .0981043     5.09792
         17  |   4.320385   1.875751     2.30   0.021     .6439798    7.996791
         18  |  -.3871664   1.275484    -0.30   0.761    -2.887069    2.112737
         19  |   1.916738   2.008069     0.95   0.340    -2.019004     5.85248
         20  |  -.9964239   1.276057    -0.78   0.435     -3.49745    1.504602
         21  |  -2.379863    2.23427    -1.07   0.287    -6.758951    1.999225
         22  |   16.43833   3.007992     5.46   0.000     10.54277    22.33388
         23  |   2.167642   1.361406     1.59   0.111    -.5006639    4.835949
         24  |   3.948888   1.281805     3.08   0.002     1.436597    6.461179
```

```
          25 |   4.760979   1.330846     3.58   0.000     2.152569     7.36939
          26 |   10.52625   1.811087     5.81   0.000     6.976588    14.07592
          27 |   3.110042   1.321097     2.35   0.019     .5207389    5.699346
          28 |   4.603338     1.9611     2.35   0.019     .7596532    8.447022
          29 |   5.005256    1.35914     3.68   0.000     2.341391     7.66912
          30 |   1.080841   1.277324     0.85   0.397    -1.422667    3.584349
          31 |   3.928953   1.298428     3.03   0.002     1.384082    6.473825
             |
       _cons |   .7037215   .9094151     0.77   0.439    -1.078699    2.486142
------------------------------------------------------------------------------

.
. xi: reg env ltd i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   51.48
       Model |  12403.6058    31  400.116316           Prob > F      =  0.0000
    Residual |  1678.66401   216  7.77159262           R-squared     =  0.8808
-------------+------------------------------           Adj R-squared =  0.8637
       Total |  14082.2698   247   57.013238           Root MSE      =  2.7878

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |  -.0137478   .0070528    -1.95   0.053    -.0276489    .0001534
    _Ifirm_2 |   12.41928   1.891256     6.57   0.000     8.691603    16.14696
    _Ifirm_3 |    10.4702   1.393879     7.51   0.000     7.722849    13.21754
    _Ifirm_4 |   4.073114   1.406399     2.90   0.004     1.301091    6.845138
    _Ifirm_5 |    6.12827   1.518133     4.04   0.000     3.136019    9.120522
    _Ifirm_6 |   15.09379   2.662421     5.67   0.000     9.846142    20.34145
    _Ifirm_7 |   10.83364   1.406461     7.70   0.000     8.061495    13.60578
    _Ifirm_8 |  -.4986415   1.393986    -0.36   0.721    -3.246199    2.248916
    _Ifirm_9 |   3.446373   1.394473     2.47   0.014     .6978551     6.19489
   _Ifirm_10 |   4.977237   1.402965     3.55   0.000     2.211983    7.742492
   _Ifirm_11 |   2.322545   1.397316     1.66   0.098    -.4315746    5.076665
   _Ifirm_12 |   34.03373   3.415008     9.97   0.000     27.30273    40.76474
   _Ifirm_13 |   23.88016   2.399613     9.95   0.000     19.15051    28.60982
   _Ifirm_14 |   3.658491   1.400412     2.61   0.010     .8982687    6.418713
   _Ifirm_15 |   1.526287   1.404326     1.09   0.278    -1.241651    4.294225
   _Ifirm_16 |   2.754107   1.394453     1.98   0.050     .0056305    5.502584
   _Ifirm_17 |   10.70424   1.510484     7.09   0.000     7.727064    13.68141
   _Ifirm_18 |  -.2578922   1.394131    -0.18   0.853    -3.005736    2.489951
   _Ifirm_19 |   8.749716   1.470526     5.95   0.000     5.851299    11.64813
   _Ifirm_20 |  -.8093759   1.393924    -0.58   0.562     -3.55681    1.938058
   _Ifirm_21 |   8.274728   2.335679     3.54   0.000     3.671087    12.87837
   _Ifirm_22 |   31.34355   2.700388    11.61   0.000     26.02107    36.66604
   _Ifirm_23 |   5.113992   1.509252     3.39   0.001     2.139245    8.088739
   _Ifirm_24 |   4.689825   1.399747     3.35   0.001     1.930913    7.448737
   _Ifirm_25 |   7.202082   1.483408     4.86   0.000     4.278274    10.12589
   _Ifirm_26 |   17.50874   1.753833     9.98   0.000     14.05192    20.96556
   _Ifirm_27 |     5.0466   1.429806     3.53   0.001     2.228443    7.864758
   _Ifirm_28 |   13.31127   2.084914     6.38   0.000     9.201887    17.42065
   _Ifirm_29 |   7.343574   1.421639     5.17   0.000     4.541514    10.14563
   _Ifirm_30 |   1.488573   1.395597     1.07   0.287    -1.262159    4.239305
   _Ifirm_31 |    5.29541   1.411694     3.75   0.000     2.512951    8.077869
       _cons |   1.153718   .9856215     1.17   0.243    -.7889497    3.096385
------------------------------------------------------------------------------

. vif
```

```
     Variable |       VIF       1/VIF  
-------------+----------------------
          ltd |     23.03    0.043418
    _Ifirm_12 |     11.62    0.086075
    _Ifirm_22 |      7.26    0.137660
     _Ifirm_6 |      7.06    0.141614
    _Ifirm_13 |      5.74    0.174332
    _Ifirm_21 |      5.43    0.184007
    _Ifirm_28 |      4.33    0.230932
     _Ifirm_2 |      3.56    0.280647
    _Ifirm_26 |      3.06    0.326350
     _Ifirm_5 |      2.30    0.435553
    _Ifirm_17 |      2.27    0.439975
    _Ifirm_23 |      2.27    0.440694
    _Ifirm_25 |      2.19    0.456183
    _Ifirm_19 |      2.15    0.464211
    _Ifirm_27 |      2.04    0.491028
    _Ifirm_29 |      2.01    0.496686
    _Ifirm_31 |      1.99    0.503709
     _Ifirm_7 |      1.97    0.507464
     _Ifirm_4 |      1.97    0.507508
    _Ifirm_15 |      1.96    0.509008
    _Ifirm_10 |      1.96    0.509996
    _Ifirm_14 |      1.95    0.511857
    _Ifirm_24 |      1.95    0.512344
    _Ifirm_11 |      1.95    0.514128
    _Ifirm_30 |      1.94    0.515395
     _Ifirm_9 |      1.94    0.516226
    _Ifirm_16 |      1.94    0.516241
    _Ifirm_18 |      1.94    0.516479
     _Ifirm_8 |      1.94    0.516587
    _Ifirm_20 |      1.94    0.516633
     _Ifirm_3 |      1.94    0.516666
-------------+----------------------
     Mean VIF |      3.73

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   153.44
         Prob > chi2  =   0.0000

. xtgls env ltd i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   1832.47
Log likelihood             =  -589.025          Prob > chi2        =    0.0000
```

```
------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |  -.0137478   .0065821    -2.09   0.037    -.0266484   -.0008471
             |
        firm |
          2  |   12.41928   1.765027     7.04   0.000     8.959893    15.87867
          3  |    10.4702   1.300847     8.05   0.000     7.920582    13.01981
          4  |   4.073114   1.312531     3.10   0.002       1.5006    6.645628
          5  |    6.12827   1.416807     4.33   0.000     3.351379    8.905162
          6  |   15.09379   2.484722     6.07   0.000     10.22383    19.96376
          7  |   10.83364   1.312589     8.25   0.000     8.261013    13.40627
          8  |  -.4986415   1.300947    -0.38   0.702     -3.04845    2.051167
          9  |   3.446373   1.301401     2.65   0.008     .8956727    5.997073
         10  |   4.977237   1.309326     3.80   0.000     2.411005    7.543469
         11  |   2.322545   1.304054     1.78   0.075    -.2333538    4.878444
         12  |   34.03373   3.187079    10.68   0.000     27.78717    40.28029
         13  |   23.88016   2.239455    10.66   0.000     19.49091    28.26941
         14  |   3.658491   1.306943     2.80   0.005     1.096929    6.220053
         15  |   1.526287   1.310597     1.16   0.244    -1.042436     4.09501
         16  |   2.754107   1.301382     2.12   0.034     .2034452     5.30477
         17  |   10.70424   1.409669     7.59   0.000     7.941339    13.46714
         18  |  -.2578922   1.301082    -0.20   0.843    -2.807967    2.292182
         19  |   8.749716   1.372378     6.38   0.000     6.059905    11.43953
         20  |  -.8093759   1.300888    -0.62   0.534     -3.35907    1.740318
         21  |   8.274728   2.179788     3.80   0.000     4.002423    12.54703
         22  |   31.34355   2.520155    12.44   0.000     26.40414    36.28296
         23  |   5.113992   1.408519     3.63   0.000     2.353345    7.874639
         24  |   4.689825   1.306323     3.59   0.000     2.129479    7.250171
         25  |   7.202082     1.3844     5.20   0.000     4.488708    9.915456
         26  |   17.50874   1.636776    10.70   0.000     14.30072    20.71676
         27  |     5.0466   1.334376     3.78   0.000     2.431272    7.661928
         28  |   13.31127   1.945759     6.84   0.000      9.49765    17.12489
         29  |   7.343574   1.326754     5.53   0.000     4.743185    9.943963
         30  |   1.488573    1.30245     1.14   0.253    -1.064182    4.041328
         31  |    5.29541   1.317472     4.02   0.000     2.713211    7.877609
             |
       _cons |   1.153718   .9198377     1.25   0.210    -.6491311    2.956566
------------------------------------------------------------------------------

.
. xi: reg env liab i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   51.32
       Model |  12398.7583    31  399.959946           Prob > F      =  0.0000
    Residual |  1683.51147   216   7.7940346           R-squared     =  0.8805
-------------+------------------------------           Adj R-squared =  0.8633
       Total |  14082.2698   247   57.013238           Root MSE      =  2.7918

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0060313   .0033893     1.78   0.077     -.000649    .0127117
    _Ifirm_2 |   5.511808   2.847129     1.94   0.054    -.0999036    11.12352
    _Ifirm_3 |     10.539   1.396464     7.55   0.000     7.786555    13.29144
    _Ifirm_4 |   3.080239   1.439793     2.14   0.034      .242396    5.918082
    _Ifirm_5 |   3.655854   1.575468     2.32   0.021     .5505945    6.761114
    _Ifirm_6 |   5.736744   3.104899     1.85   0.066    -.3830352    11.85652
```

```
    _Ifirm_7 |   9.258362    1.55254     5.96   0.000     6.198294    12.31843
    _Ifirm_8 |  -.5380678   1.395894    -0.39   0.700    -3.289385    2.213249
    _Ifirm_9 |   2.939661   1.416396     2.08   0.039     .1479345    5.731388
   _Ifirm_10 |   3.882667   1.463737     2.65   0.009     .9976309    6.767703
   _Ifirm_11 |    1.75766    1.41162     1.25   0.214    -1.024653    4.539974
   _Ifirm_12 |   18.77119   5.347215     3.51   0.001     8.231791    29.31059
   _Ifirm_13 |   15.12823   3.109488     4.87   0.000     8.999406    21.25705
   _Ifirm_14 |   2.763686   1.440284     1.92   0.056    -.0751242    5.602496
   _Ifirm_15 |   .7372663   1.419188     0.52   0.604    -2.059964    3.534497
   _Ifirm_16 |   2.571386    1.39713     1.84   0.067    -.1823678     5.32514
   _Ifirm_17 |   6.879009   2.057919     3.34   0.001     2.822835    10.93518
   _Ifirm_18 |  -.3819128   1.396481    -0.27   0.785    -3.134387    2.370561
   _Ifirm_19 |   5.184453   2.041893     2.54   0.012     1.159866     9.20904
   _Ifirm_20 |  -.8977802   1.396391    -0.64   0.521    -3.650078    1.854518
   _Ifirm_21 |   .2281982   2.836108     0.08   0.936    -5.361792    5.818189
   _Ifirm_22 |   20.56386   3.790572     5.43   0.000     13.09262    28.03511
   _Ifirm_23 |   2.712764   1.568546     1.73   0.085    -.3788528     5.80438
   _Ifirm_24 |   4.130101   1.406728     2.94   0.004     1.357428    6.902773
   _Ifirm_25 |   5.188867    1.50982     3.44   0.001     2.212999    8.164734
   _Ifirm_26 |   12.72644    2.06477     6.16   0.000     8.656763    16.79612
   _Ifirm_27 |   3.692117   1.455496     2.54   0.012     .8233231    6.560911
   _Ifirm_28 |   6.876116   2.372068     2.90   0.004     2.200753    11.55148
   _Ifirm_29 |   5.814365   1.501476     3.87   0.000     2.854943    8.773786
   _Ifirm_30 |   1.050818   1.406223     0.75   0.456    -1.720858    3.822494
   _Ifirm_31 |    4.30444    1.43033     3.01   0.003     1.485249    7.123631
       _cons |   .9956788   .9909569     1.00   0.316    -.9575047    2.948862
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
        liab |     49.73    0.020107
   _Ifirm_12 |     28.40    0.035209
   _Ifirm_22 |     14.27    0.070065
   _Ifirm_13 |      9.60    0.104120
    _Ifirm_6 |      9.58    0.104428
    _Ifirm_2 |      8.05    0.124193
   _Ifirm_21 |      7.99    0.125160
   _Ifirm_28 |      5.59    0.178920
   _Ifirm_26 |      4.23    0.236140
   _Ifirm_17 |      4.21    0.237715
   _Ifirm_19 |      4.14    0.241461
    _Ifirm_5 |      2.47    0.405596
   _Ifirm_23 |      2.44    0.409184
    _Ifirm_7 |      2.39    0.417664
   _Ifirm_25 |      2.26    0.441634
   _Ifirm_29 |      2.24    0.446556
   _Ifirm_10 |      2.13    0.469880
   _Ifirm_27 |      2.10    0.475215
   _Ifirm_14 |      2.06    0.485307
    _Ifirm_4 |      2.06    0.485638
   _Ifirm_31 |      2.03    0.492085
   _Ifirm_15 |      2.00    0.499842
    _Ifirm_9 |      1.99    0.501815
   _Ifirm_11 |      1.98    0.505216
   _Ifirm_24 |      1.97    0.508736
   _Ifirm_30 |      1.96    0.509101
   _Ifirm_16 |      1.94    0.515750
   _Ifirm_18 |      1.94    0.516229
```

```
    _Ifirm_3 |      1.94    0.516242
   _Ifirm_20 |      1.94    0.516296
    _Ifirm_8 |      1.94    0.516664
-------------+----------------------
    Mean VIF |      6.05

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   122.17
         Prob > chi2  =   0.0000

. xtgls env liab i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   1826.48
Log likelihood             = -589.3826          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0060313   .0031631     1.91   0.057    -.0001682    .0122309
             |
        firm |
          2  |   5.511808   2.657101     2.07   0.038     .3039852    10.71963
          3  |     10.539   1.303259     8.09   0.000     7.984655    13.09334
          4  |   3.080239   1.343696     2.29   0.022     .4466426    5.713835
          5  |   3.655854   1.470316     2.49   0.013     .7740877     6.53762
          6  |   5.736744   2.897667     1.98   0.048     .0574205    11.41607
          7  |   9.258362   1.448918     6.39   0.000     6.418535    12.09819
          8  |  -.5380678   1.302727    -0.41   0.680    -3.091365     2.01523
          9  |   2.939661   1.321861     2.22   0.026      .348862     5.53046
         10  |   3.882667   1.366042     2.84   0.004     1.205274     6.56006
         11  |    1.75766   1.317404     1.33   0.182    -.8244032    4.339724
         12  |   18.77119   4.990324     3.76   0.000     8.990338    28.55205
         13  |   15.12823    2.90195     5.21   0.000     9.440512    20.81595
         14  |   2.763686   1.344154     2.06   0.040     .1291919    5.398179
         15  |   .7372663   1.324467     0.56   0.578    -1.858641    3.333173
         16  |   2.571386   1.303881     1.97   0.049     .0158267    5.126946
         17  |   6.879009   1.920567     3.58   0.000     3.114768    10.64325
         18  |  -.3819128   1.303275    -0.29   0.769    -2.936285    2.172459
         19  |   5.184453    1.90561     2.72   0.007     1.449526     8.91938
         20  |  -.8977802   1.303191    -0.69   0.491    -3.451988    1.656428
         21  |   .2281982   2.646816     0.09   0.931    -4.959467    5.415863
         22  |   20.56386   3.537576     5.81   0.000     13.63034    27.49738
         23  |   2.712764   1.463856     1.85   0.064    -.1563415    5.581869
         24  |   4.130101   1.312838     3.15   0.002     1.556985    6.703217
         25  |   5.188867    1.40905     3.68   0.000      2.42718    7.950554
         26  |   12.72644    1.92696     6.60   0.000     8.949668    16.50321
```

```
          27 |   3.692117   1.358351     2.72   0.007     1.029797    6.354437
          28 |   6.876116   2.213747     3.11   0.002      2.53725    11.21498
          29 |   5.814365   1.401263     4.15   0.000      3.06794    8.560789
          30 |   1.050818   1.312367     0.80   0.423    -1.521374     3.62301
          31 |    4.30444   1.334865     3.22   0.001     1.688153    6.920726
             |
       _cons |   .9956788    .924817     1.08   0.282    -.8169292    2.808287
------------------------------------------------------------------------------

.
. xi: reg env oe i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     248
-------------+------------------------------           F( 31,   216) =   65.12
       Model |   12721.108    31  410.358321           Prob > F      =  0.0000
    Residual |  1361.16183   216  6.30167514           R-squared     =  0.9033
-------------+------------------------------           Adj R-squared =  0.8895
       Total |  14082.2698   247   57.013238           Root MSE      =  2.5103

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          oe |   .0155779   .0020992     7.42   0.000     .0114404    .0197154
    _Ifirm_2 |   2.260949   1.625656     1.39   0.166    -.9432306    5.465129
    _Ifirm_3 |   10.60217   1.255288     8.45   0.000      8.12799    13.07635
    _Ifirm_4 |   2.944625   1.259367     2.34   0.020     .4624044    5.426846
    _Ifirm_5 |   2.577649    1.29542     1.99   0.048     .0243658    5.130932
    _Ifirm_6 |   8.585073   1.286279     6.67   0.000     6.049807    11.12034
    _Ifirm_7 |   8.080376    1.29573     6.24   0.000     5.526483    10.63427
    _Ifirm_8 |   .0452726   1.257568     0.04   0.971    -2.433404    2.523949
    _Ifirm_9 |   2.037018   1.267888     1.61   0.110    -.4619978    4.536034
   _Ifirm_10 |   .5693669   1.371219     0.42   0.678    -2.133316     3.27205
   _Ifirm_11 |   1.468572   1.258333     1.17   0.244    -1.011612    3.948755
   _Ifirm_12 |   18.71181   1.768455    10.58   0.000     15.22618    22.19745
   _Ifirm_13 |   13.57387   1.530478     8.87   0.000     10.55729    16.59046
   _Ifirm_14 |    2.45358   1.261553     1.94   0.053    -.0329512    4.940111
   _Ifirm_15 |   .7328739   1.256687     0.58   0.560    -1.744066    3.209814
   _Ifirm_16 |   2.194369   1.256835     1.75   0.082    -.2828614    4.671599
   _Ifirm_17 |   5.193502   1.386798     3.74   0.000     2.460114    7.926891
   _Ifirm_18 |  -.1345276   1.255379    -0.11   0.915    -2.608888    2.339833
   _Ifirm_19 |  -7.796524   2.452184    -3.18   0.002     -12.6298   -2.963251
   _Ifirm_20 |  -.8179222   1.255158    -0.65   0.515    -3.291848    1.656004
   _Ifirm_21 |   1.782464   1.312167     1.36   0.176    -.8038256    4.368755
   _Ifirm_22 |   16.23623   1.901412     8.54   0.000     12.48853    19.98393
   _Ifirm_23 |   2.529508   1.270407     1.99   0.048     .0255263    5.033489
   _Ifirm_24 |   3.704128   1.259071     2.94   0.004     1.222491    6.185766
   _Ifirm_25 |   4.687957   1.271864     3.69   0.000     2.181104     7.19481
   _Ifirm_26 |   13.82724   1.273692    10.86   0.000     11.31678     16.3377
   _Ifirm_27 |   3.112407   1.267573     2.46   0.015     .6140122    5.610802
   _Ifirm_28 |   8.865794   1.269724     6.98   0.000     6.363158    11.36843
   _Ifirm_29 |   4.110306    1.30639     3.15   0.002     1.535402    6.685209
   _Ifirm_30 |   .4122862    1.26155     0.33   0.744    -2.074239    2.898812
   _Ifirm_31 |   3.405001   1.270371     2.68   0.008     .9010905    5.908911
       _cons |   .3267484    .894474     0.37   0.715    -1.436267    2.089763
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
```

```
-------------+----------------------
          oe |     10.17    0.098371
   _Ifirm_19 |      7.39    0.135363
   _Ifirm_22 |      4.44    0.225141
   _Ifirm_12 |      3.84    0.260267
    _Ifirm_2 |      3.25    0.307999
   _Ifirm_13 |      2.88    0.347498
   _Ifirm_17 |      2.36    0.423234
   _Ifirm_10 |      2.31    0.432905
   _Ifirm_21 |      2.12    0.472747
   _Ifirm_29 |      2.10    0.476937
    _Ifirm_7 |      2.06    0.484817
    _Ifirm_5 |      2.06    0.485048
    _Ifirm_6 |      2.03    0.491967
   _Ifirm_26 |      1.99    0.501739
   _Ifirm_25 |      1.99    0.503182
   _Ifirm_23 |      1.98    0.504337
   _Ifirm_31 |      1.98    0.504366
   _Ifirm_28 |      1.98    0.504879
    _Ifirm_9 |      1.97    0.506343
   _Ifirm_27 |      1.97    0.506595
   _Ifirm_14 |      1.96    0.511441
   _Ifirm_30 |      1.96    0.511443
    _Ifirm_4 |      1.95    0.513218
   _Ifirm_24 |      1.95    0.513460
   _Ifirm_11 |      1.95    0.514062
    _Ifirm_8 |      1.94    0.514687
   _Ifirm_16 |      1.94    0.515288
   _Ifirm_15 |      1.94    0.515409
   _Ifirm_18 |      1.94    0.516484
    _Ifirm_3 |      1.94    0.516559
   _Ifirm_20 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      2.65

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =    94.68
         Prob > chi2  =   0.0000

. xtgls env oe i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       248
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         8
                                                Wald chi2(31)      =   2317.75
Log likelihood             = -563.0272          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
          oe |   .0155779   .0019591     7.95   0.000     .0117382    .0194176
             |
        firm |
          2  |   2.260949   1.517154     1.49   0.136    -.7126179    5.234516
          3  |   10.60217   1.171505     9.05   0.000     8.306063    12.89828
          4  |   2.944625   1.175312     2.51   0.012      .641056    5.248195
          5  |   2.577649   1.208959     2.13   0.033     .2081319    4.947166
          6  |   8.585073   1.200429     7.15   0.000     6.232276    10.93787
          7  |   8.080376   1.209248     6.68   0.000     5.710293    10.45046
          8  |   .0452726   1.173634     0.04   0.969    -2.255007    2.345553
          9  |   2.037018   1.183264     1.72   0.085    -.2821375    4.356174
         10  |   .5693669   1.279699     0.44   0.656    -1.938797    3.077531
         11  |   1.468572   1.174348     1.25   0.211    -.8331073     3.77025
         12  |   18.71181   1.650422    11.34   0.000     15.47705    21.94658
         13  |   13.57387   1.428329     9.50   0.000      10.7744    16.37335
         14  |    2.45358   1.177353     2.08   0.037     .1460106    4.761149
         15  |   .7328739   1.172812     0.62   0.532    -1.565795    3.031543
         16  |   2.194369   1.172949     1.87   0.061     -.104569    4.493307
         17  |   5.193502   1.294238     4.01   0.000     2.656842    7.730163
         18  |  -.1345276    1.17159    -0.11   0.909    -2.430802    2.161747
         19  |  -7.796524   2.288517    -3.41   0.001    -12.28194   -3.311113
         20  |  -.8179222   1.171385    -0.70   0.485    -3.113794    1.477949
         21  |   1.782464   1.224588     1.46   0.146    -.6176839    4.182613
         22  |   16.23623   1.774505     9.15   0.000     12.75826    19.71419
         23  |   2.529508   1.185616     2.13   0.033     .2057441    4.853272
         24  |   3.704128   1.175036     3.15   0.002     1.401101    6.007156
         25  |   4.687957   1.186975     3.95   0.000     2.361528    7.014386
         26  |   13.82724   1.188681    11.63   0.000     11.49747    16.15701
         27  |   3.112407    1.18297     2.63   0.009     .7938279    5.430987
         28  |   8.865794   1.184978     7.48   0.000     6.543279    11.18831
         29  |   4.110306   1.219197     3.37   0.001     1.720724    6.499887
         30  |   .4122862    1.17735     0.35   0.726    -1.895278     2.71985
         31  |   3.405001   1.185582     2.87   0.004     1.081303    5.728698
             |
       _cons |   .3267484   .8347737     0.39   0.695    -1.309378    1.962875
------------------------------------------------------------------------------

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Independent 2001-2008.log
  log type:  text
 closed on:   8 Jul 2012, 20:13:32
```

Appendix L: Environment as the Dependent Variable 2001-2009

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Dependent 2001-2009.log
  log type:  text
 opened on:   8 Jul 2012, 21:05:23

. edit

. *(12 variables, 279 observations pasted into data editor)

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2009
                delta:  1 unit

.
. xi: reg revtot env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  167.86
       Model |  76684971.3    31  2473708.75           Prob > F      =  0.0000
    Residual |  3639910.62   247  14736.4803           R-squared     =  0.9547
-------------+------------------------------           Adj R-squared =  0.9490
       Total |  80324881.9   278  288938.424           Root MSE      =  121.39

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   27.09412   2.799505     9.68   0.000     21.58018    32.60807
    _Ifirm_2 |   1047.277   63.69431    16.44   0.000     921.8242    1172.731
    _Ifirm_3 |  -333.8078    64.1608    -5.20   0.000    -460.1799   -207.4358
    _Ifirm_4 |  -3.891607   58.19606    -0.07   0.947    -118.5154    110.7322
    _Ifirm_5 |   97.48089   58.90523     1.65   0.099    -18.53972    213.5015
    _Ifirm_6 |   607.9651   64.86386     9.37   0.000     480.2082    735.7219
    _Ifirm_7 |   184.1871    64.1608     2.87   0.004       57.815    310.5591
    _Ifirm_8 |  -31.48296   57.24347    -0.55   0.583    -144.2305    81.26464
    _Ifirm_9 |   25.87571    57.9932     0.45   0.656    -88.34856       140.1
   _Ifirm_10 |   144.3092   58.56476     2.46   0.014     28.95922    259.6592
   _Ifirm_11 |  -13.01269     57.613    -0.23   0.821    -126.4881    100.4627
   _Ifirm_12 |   1418.056   97.14333    14.60   0.000     1226.721    1609.391
   _Ifirm_13 |   655.4916   81.03601     8.09   0.000     495.8819    815.1013
   _Ifirm_14 |   42.53456   57.85441     0.74   0.463    -71.41635    156.4855
   _Ifirm_15 |   21.02108   57.32862     0.37   0.714    -91.89421    133.9364
   _Ifirm_16 |  -60.65281   57.73011    -1.05   0.294    -174.3589    53.05327
   _Ifirm_17 |   527.7529   63.43729     8.32   0.000     402.8058    652.6999
   _Ifirm_18 |   -18.0922   57.23307    -0.32   0.752    -130.8193     94.6349
   _Ifirm_19 |   711.8229   61.58954    11.56   0.000     590.5152    833.1305
   _Ifirm_20 |   19.52205   57.26557     0.34   0.733    -93.26906    132.3132
   _Ifirm_21 |   589.0502   58.71066    10.03   0.000     473.4128    704.6876
   _Ifirm_22 |   557.3404   97.16721     5.74   0.000     365.9584    748.7224
   _Ifirm_23 |   148.1105   58.35263     2.54   0.012     33.17831    263.0427
   _Ifirm_24 |  -66.45524   58.63676    -1.13   0.258    -181.9471     49.0366
```

```
    _Ifirm_25 |   -2.73916   59.90294    -0.05   0.964    -120.7249    115.2465
    _Ifirm_26 |   83.10595   72.24497     1.15   0.251     -59.1888    225.4007
    _Ifirm_27 |   24.87683   58.51021     0.43   0.671    -90.36574    140.1194
    _Ifirm_28 |   214.3223   64.38881     3.33   0.001     87.50116    341.1435
    _Ifirm_29 |   148.1047   60.42589     2.45   0.015       29.089    267.1204
    _Ifirm_30 |   7.711944   57.34617     0.13   0.893    -105.2379    120.6618
    _Ifirm_31 |   -11.0542   58.97148    -0.19   0.851    -127.2053    105.0969
        _cons |    57.7935   40.59233     1.42   0.156    -22.15776    137.7448
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |      8.74    0.114442
   _Ifirm_22 |      5.58    0.179206
   _Ifirm_12 |      5.58    0.179294
   _Ifirm_13 |      3.88    0.257653
   _Ifirm_26 |      3.08    0.324173
    _Ifirm_6 |      2.49    0.402148
   _Ifirm_28 |      2.45    0.408104
    _Ifirm_3 |      2.43    0.411010
    _Ifirm_7 |      2.43    0.411010
    _Ifirm_2 |      2.40    0.417052
   _Ifirm_17 |      2.38    0.420438
   _Ifirm_19 |      2.24    0.446044
   _Ifirm_29 |      2.16    0.463389
   _Ifirm_25 |      2.12    0.471515
   _Ifirm_31 |      2.06    0.486528
    _Ifirm_5 |      2.05    0.487623
   _Ifirm_21 |      2.04    0.490860
   _Ifirm_24 |      2.03    0.492098
   _Ifirm_10 |      2.03    0.493309
   _Ifirm_27 |      2.02    0.494229
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of revtot

         chi2(1)      =   507.76
         Prob > chi2  =   0.0000

. xtgls revtot env i. firm

Cross-sectional time-series FGLS regression
```

```
Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   5877.92
Log likelihood             = -1717.822          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   27.09412   2.634072    10.29   0.000     21.93144    32.25681
             |
        firm |
          2  |   1047.277   59.93037    17.47   0.000     929.8161    1164.739
          3  |  -333.8078    60.3693    -5.53   0.000    -452.1295   -215.4862
          4  |  -3.891607   54.75704    -0.07   0.943    -111.2134    103.4302
          5  |   97.48089    55.4243     1.76   0.079    -11.14874    206.1105
          6  |   607.9651   61.03081     9.96   0.000     488.3469    727.5832
          7  |   184.1871    60.3693     3.05   0.002     65.86541    302.5087
          8  |  -31.48296   53.86075    -0.58   0.559    -137.0481    74.08217
          9  |   25.87571   54.56617     0.47   0.635    -81.07202    132.8234
         10  |   144.3092   55.10395     2.62   0.009     36.30747     252.311
         11  |  -13.01269   54.20843    -0.24   0.810    -119.2593    93.23389
         12  |   1418.056   91.40277    15.51   0.000      1238.91    1597.202
         13  |   655.4916   76.24729     8.60   0.000     506.0497    804.9335
         14  |   42.53456   54.43558     0.78   0.435    -64.15722    149.2263
         15  |   21.02108   53.94086     0.39   0.697    -84.70106    126.7432
         16  |  -60.65281   54.31863    -1.12   0.264    -167.1154    45.80974
         17  |   527.7529   59.68855     8.84   0.000     410.7655    644.7403
         18  |   -18.0922   53.85096    -0.34   0.737    -123.6381    87.45374
         19  |   711.8229   57.94999    12.28   0.000      598.243    825.4028
         20  |   19.52205   53.88153     0.36   0.717    -86.08381    125.1279
         21  |   589.0502   55.24123    10.66   0.000     480.7794     697.321
         22  |   557.3404   91.42524     6.10   0.000     378.1502    736.5306
         23  |   148.1105   54.90435     2.70   0.007     40.49995    255.7211
         24  |  -66.45524    55.1717    -1.20   0.228    -174.5898    41.67931
         25  |   -2.73916   56.36305    -0.05   0.961    -113.2087    107.7304
         26  |   83.10595   67.97574     1.22   0.221    -50.12406     216.336
         27  |   24.87683   55.05263     0.45   0.651    -83.02433     132.778
         28  |   214.3223   60.58384     3.54   0.000     95.58017    333.0645
         29  |   148.1047    56.8551     2.60   0.009     36.67077    259.5387
         30  |   7.711944   53.95737     0.14   0.886    -98.04257    113.4665
         31  |   -11.0542   55.48663    -0.20   0.842     -119.806     97.6976
             |
       _cons |    57.7935   38.19358     1.51   0.130    -17.06454    132.6515
------------------------------------------------------------------------------

. xi: reg cos env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  125.63
       Model |  41113341.1    31  1326236.81           Prob > F      =  0.0000
    Residual |   2607580.9   247  10557.0077           R-squared     =  0.9404
-------------+------------------------------           Adj R-squared =  0.9329
       Total |    43720922   278  157269.504           Root MSE      =  102.75
```

cos	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	22.17418	2.36949	9.36	0.000	17.50719	26.84116
_Ifirm_2	696.3632	53.9106	12.92	0.000	590.18	802.5463
_Ifirm_3	-269.6981	54.30543	-4.97	0.000	-376.6588	-162.7373
_Ifirm_4	-23.91213	49.2569	-0.49	0.628	-120.9293	73.105
_Ifirm_5	43.81174	49.85714	0.88	0.380	-54.38761	142.0111
_Ifirm_6	428.889	54.9005	7.81	0.000	320.7562	537.0219
_Ifirm_7	91.22383	54.30543	1.68	0.094	-15.73696	198.1846
_Ifirm_8	-19.04442	48.45064	-0.39	0.695	-114.4735	76.38467
_Ifirm_9	.8503496	49.08521	0.02	0.986	-95.8286	97.5293
_Ifirm_10	69.73904	49.56897	1.41	0.161	-27.89273	167.3708
_Ifirm_11	-21.47318	48.76341	-0.44	0.660	-117.5183	74.57194
_Ifirm_12	993.5905	82.22172	12.08	0.000	831.6454	1155.536
_Ifirm_13	482.5393	68.58854	7.04	0.000	347.4463	617.6323
_Ifirm_14	9.412647	48.96774	0.19	0.848	-87.03493	105.8602
_Ifirm_15	10.13175	48.52271	0.21	0.835	-85.43928	105.7028
_Ifirm_16	-51.07913	48.86253	-1.05	0.297	-147.3195	45.16123
_Ifirm_17	329.8753	53.69306	6.14	0.000	224.1207	435.63
_Ifirm_18	-13.77193	48.44184	-0.28	0.776	-109.1837	81.63982
_Ifirm_19	400.0187	52.12913	7.67	0.000	297.3444	502.693
_Ifirm_20	14.59853	48.46934	0.30	0.764	-80.8674	110.0644
_Ifirm_21	466.8051	49.69246	9.39	0.000	368.9301	564.6801
_Ifirm_22	275.5028	82.24193	3.35	0.001	113.5179	437.4877
_Ifirm_23	76.15082	49.38942	1.54	0.124	-21.12732	173.429
_Ifirm_24	-66.72176	49.62992	-1.34	0.180	-164.4736	31.03005
_Ifirm_25	-44.60209	50.7016	-0.88	0.380	-144.4647	55.26052
_Ifirm_26	34.65586	61.14784	0.57	0.571	-85.78182	155.0936
_Ifirm_27	10.88672	49.5228	0.22	0.826	-86.65412	108.4276
_Ifirm_28	147.3948	54.49843	2.70	0.007	40.05388	254.7357
_Ifirm_29	71.80575	51.14422	1.40	0.162	-28.92867	172.5402
_Ifirm_30	-15.7021	48.53756	-0.32	0.747	-111.3024	79.8982
_Ifirm_31	-17.75626	49.91321	-0.36	0.722	-116.0661	80.55355
_cons	37.7285	34.35718	1.10	0.273	-29.94191	105.3989

. vif

Variable	VIF	1/VIF
env	8.74	0.114442
_Ifirm_22	5.58	0.179206
_Ifirm_12	5.58	0.179294
_Ifirm_13	3.88	0.257653
_Ifirm_26	3.08	0.324173
_Ifirm_6	2.49	0.402148
_Ifirm_28	2.45	0.408104
_Ifirm_3	2.43	0.411010
_Ifirm_7	2.43	0.411010
_Ifirm_2	2.40	0.417052
_Ifirm_17	2.38	0.420438
_Ifirm_19	2.24	0.446044
_Ifirm_29	2.16	0.463389
_Ifirm_25	2.12	0.471515
_Ifirm_31	2.06	0.486528
_Ifirm_5	2.05	0.487623
_Ifirm_21	2.04	0.490860
_Ifirm_24	2.03	0.492098

```
   _Ifirm_10 |      2.03    0.493309
   _Ifirm_27 |      2.02    0.494229
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of cos

         chi2(1)      =   630.99
         Prob > chi2  =   0.0000

. xtgls cos env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   4398.95
Log likelihood             = -1671.294          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         cos |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   22.17418   2.229468     9.95   0.000      17.8045    26.54385
             |
        firm |
          2  |   696.3632   50.72482    13.73   0.000     596.9443     795.782
          3  |  -269.6981   51.09632    -5.28   0.000     -369.845   -169.5511
          4  |  -23.91213   46.34613    -0.52   0.606    -114.7489    66.92462
          5  |   43.81174    46.9109     0.93   0.350    -48.13192    135.7554
          6  |    428.889   51.65623     8.30   0.000     327.6447    530.1334
          7  |   91.22383   51.09632     1.79   0.074    -8.92313    191.3708
          8  |  -19.04442   45.58751    -0.42   0.676    -108.3943    70.30546
          9  |   .8503496   46.18458     0.02   0.985    -89.66977    91.37047
         10  |   69.73904   46.63975     1.50   0.135     -21.6732    161.1513
         11  |  -21.47318    45.8818    -0.47   0.640    -111.3999    68.45348
         12  |   993.5905   77.36293    12.84   0.000      841.962    1145.219
         13  |   482.5393   64.53539     7.48   0.000     356.0523    609.0264
         14  |   9.412647   46.07405     0.20   0.838    -80.89083    99.71613
         15  |   10.13175   45.65532     0.22   0.824    -79.35103    99.61453
         16  |  -51.07913   45.97506    -1.11   0.267    -141.1886    39.03033
```

```
          17 |   329.8753   50.52014     6.53   0.000     230.8577     428.893
          18 |  -13.77193   45.57923    -0.30   0.763    -103.1056    75.56172
          19 |   400.0187   49.04863     8.16   0.000     303.8852    496.1523
          20 |   14.59853   45.60511     0.32   0.749    -74.78584    103.9829
          21 |   466.8051   46.75595     9.98   0.000     375.1651    558.4451
          22 |   275.5028   77.38195     3.56   0.000     123.8369    427.1686
          23 |   76.15082   46.47082     1.64   0.101    -14.93032    167.2319
          24 |  -66.72176    46.6971    -1.43   0.153    -158.2464    24.80287
          25 |  -44.60209   47.70545    -0.93   0.350    -138.1031    48.89888
          26 |   34.65586   57.53439     0.60   0.547    -78.10946    147.4212
          27 |   10.88672   46.59632     0.23   0.815    -80.44038    102.2138
          28 |   147.3948   51.27791     2.87   0.004     46.89192    247.8976
          29 |   71.80575   48.12192     1.49   0.136    -22.51148     166.123
          30 |   -15.7021    45.6693    -0.34   0.731    -105.2123    73.80808
          31 |  -17.75626   46.96366    -0.38   0.705    -109.8033    74.29082
             |
       _cons |    37.7285   32.32689     1.17   0.243    -25.63104     101.088
------------------------------------------------------------------------------

.
. xi: reg ni env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =    7.70
       Model |  117575.183    31  3792.74783           Prob > F      =  0.0000
    Residual |  121594.787   247  492.286588           R-squared     =  0.4916
-------------+------------------------------           Adj R-squared =  0.4278
       Total |   239169.97   278  860.323633           Root MSE      =  22.188

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   1.602143   .5116741     3.13   0.002     .5943423    2.609944
    _Ifirm_2 |   6.940345    11.6416     0.60   0.552    -15.98912    29.86982
    _Ifirm_3 |  -21.24379   11.72686    -1.81   0.071    -44.34119    1.853615
    _Ifirm_4 |  -3.055035   10.63667    -0.29   0.774    -24.00518    17.89511
    _Ifirm_5 |   -4.92918   10.76629    -0.46   0.647    -26.13462    16.27626
    _Ifirm_6 |  -11.24687   11.85536    -0.95   0.344    -34.59737    12.10363
    _Ifirm_7 |  -3.190011   11.72686    -0.27   0.786    -26.28741    19.90739
    _Ifirm_8 |  -3.784306   10.46256    -0.36   0.718    -24.39153    16.82291
    _Ifirm_9 |   -1.14151   10.59959    -0.11   0.914    -22.01863    19.73561
   _Ifirm_10 |   2.499557   10.70406     0.23   0.816    -18.58331    23.58243
   _Ifirm_11 |  -4.905461    10.5301    -0.47   0.642    -25.64571    15.83478
   _Ifirm_12 |    -10.712   17.75518    -0.60   0.547    -45.68287    24.25886
   _Ifirm_13 |  -25.54694    14.8112    -1.72   0.086     -54.7193    3.625407
   _Ifirm_14 |  -4.417312   10.57423    -0.42   0.676    -25.24446    16.40984
   _Ifirm_15 |  -2.258985   10.47813    -0.22   0.829    -22.89686    18.37889
   _Ifirm_16 |  -6.792296   10.55151    -0.64   0.520     -27.5747    13.99011
   _Ifirm_17 |  -18.68656   11.59463    -1.61   0.108     -41.5235    4.150388
   _Ifirm_18 |   -2.52856   10.46066    -0.24   0.809    -23.13203    18.07491
   _Ifirm_19 |   91.10852   11.25691     8.09   0.000     68.93675    113.2803
   _Ifirm_20 |    .330978    10.4666     0.03   0.975    -20.28419    20.94615
   _Ifirm_21 |  -8.110577   10.73073    -0.76   0.450    -29.24597    13.02482
   _Ifirm_22 |  -7.327025   17.75955    -0.41   0.680    -42.30649    27.65244
   _Ifirm_23 |  -.5166922   10.66529    -0.05   0.961     -21.5232    20.48981
   _Ifirm_24 |  -8.211144   10.71722    -0.77   0.444    -29.31994    12.89765
   _Ifirm_25 |  -7.236334   10.94864    -0.66   0.509    -28.80094    14.32827
   _Ifirm_26 |  -18.20093   13.20443    -1.38   0.169    -44.20858    7.806709
   _Ifirm_27 |  -8.516712   10.69409    -0.80   0.427    -29.57995    12.54652
```

```
   _Ifirm_28 |  -12.19962   11.76854    -1.04   0.301     -35.3791    10.97987
   _Ifirm_29 |  -.7746981   11.04422    -0.07   0.944    -22.52756    20.97817
   _Ifirm_30 |  -1.899645   10.48133    -0.18   0.856    -22.54383    18.74454
   _Ifirm_31 |  -5.309059    10.7784    -0.49   0.623    -26.53835    15.92023
       _cons |   3.059782   7.419184     0.41   0.680    -11.55315    17.67272
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.74    0.114442
   _Ifirm_22 |      5.58    0.179206
   _Ifirm_12 |      5.58    0.179294
   _Ifirm_13 |      3.88    0.257653
   _Ifirm_26 |      3.08    0.324173
    _Ifirm_6 |      2.49    0.402148
   _Ifirm_28 |      2.45    0.408104
    _Ifirm_3 |      2.43    0.411010
    _Ifirm_7 |      2.43    0.411010
    _Ifirm_2 |      2.40    0.417052
   _Ifirm_17 |      2.38    0.420438
   _Ifirm_19 |      2.24    0.446044
   _Ifirm_29 |      2.16    0.463389
   _Ifirm_25 |      2.12    0.471515
   _Ifirm_31 |      2.06    0.486528
    _Ifirm_5 |      2.05    0.487623
   _Ifirm_21 |      2.04    0.490860
   _Ifirm_24 |      2.03    0.492098
   _Ifirm_10 |      2.03    0.493309
   _Ifirm_27 |      2.02    0.494229
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of ni

         chi2(1)      =   249.31
         Prob > chi2  =   0.0000

. xtgls ni env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
```

```
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =    269.78
Log likelihood             = -1243.658          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   1.602143   .4814374     3.33   0.001     .6585432    2.545743
             |
        firm |
          2  |   6.940345   10.95366     0.63   0.526    -14.52843    28.40912
          3  |  -21.24379   11.03388    -1.93   0.054     -42.8698    .3822183
          4  |  -3.055035   10.00811    -0.31   0.760    -22.67057     16.5605
          5  |   -4.92918   10.13007    -0.49   0.627    -24.78375    14.92539
          6  |  -11.24687   11.15479    -1.01   0.313    -33.10985    10.61611
          7  |  -3.190011   11.03388    -0.29   0.772    -24.81602      18.436
          8  |  -3.784306   9.844292    -0.38   0.701    -23.07876    15.51015
          9  |   -1.14151   9.973224    -0.11   0.909    -20.68867    18.40565
         10  |   2.499557   10.07152     0.25   0.804    -17.24025    22.23936
         11  |  -4.905461    9.90784    -0.50   0.621    -24.32447    14.51355
         12  |    -10.712   16.70596    -0.64   0.521    -43.45509    22.03108
         13  |  -25.54694   13.93595    -1.83   0.067     -52.8609    1.767012
         14  |  -4.417312   9.949356    -0.44   0.657    -23.91769    15.08307
         15  |  -2.258985   9.858934    -0.23   0.819    -21.58214    17.06417
         16  |  -6.792296    9.92798    -0.68   0.494    -26.25078    12.66619
         17  |  -18.68656   10.90946    -1.71   0.087     -40.0687    2.695584
         18  |   -2.52856   9.842503    -0.26   0.797    -21.81951    16.76239
         19  |   91.10852   10.59169     8.60   0.000     70.34918    111.8679
         20  |    .330978   9.848091     0.03   0.973    -18.97093    19.63288
         21  |  -8.110577   10.09661    -0.80   0.422    -27.89956    11.67841
         22  |  -7.327025   16.71007    -0.44   0.661    -40.07816    25.42411
         23  |  -.5166922   10.03504    -0.05   0.959      -20.185    19.15162
         24  |  -8.211144    10.0839    -0.81   0.415    -27.97522    11.55294
         25  |  -7.236334   10.30165    -0.70   0.482    -27.42719    12.95452
         26  |  -18.20093   12.42413    -1.46   0.143    -42.55179    6.149919
         27  |  -8.516712   10.06214    -0.85   0.397    -28.23813    11.20471
         28  |  -12.19962   11.07309    -1.10   0.271    -33.90248    9.503246
         29  |  -.7746981   10.39158    -0.07   0.941    -21.14182    19.59242
         30  |  -1.899645   9.861953    -0.19   0.847    -21.22872    17.42943
         31  |  -5.309059   10.14146    -0.52   0.601    -25.18596    14.56784
             |
       _cons |   3.059782   6.980757     0.44   0.661    -10.62225    16.74181
------------------------------------------------------------------------------

.
. xi: reg curra env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  187.31
       Model |  18030752.8    31  581637.187           Prob > F      =  0.0000
    Residual |  766980.117   247  3105.18266           R-squared     =  0.9592
-------------+------------------------------           Adj R-squared =  0.9541
       Total |  18797732.9   278  67617.7443           Root MSE      =  55.724

------------------------------------------------------------------------------
```

curra	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	9.197751	1.285074	7.16	0.000	6.666652	11.72885
_Ifirm_2	484.1754	29.23798	16.56	0.000	426.5879	541.763
_Ifirm_3	-121.2064	29.45211	-4.12	0.000	-179.2157	-63.19709
_Ifirm_4	6.586855	26.71408	0.25	0.805	-46.0296	59.20331
_Ifirm_5	70.88824	27.03962	2.62	0.009	17.63061	124.1459
_Ifirm_6	261.1159	29.77484	8.77	0.000	202.4709	319.7608
_Ifirm_7	83.35793	29.45211	2.83	0.005	25.34861	141.3672
_Ifirm_8	-19.18373	26.27681	-0.73	0.466	-70.93892	32.57147
_Ifirm_9	37.03638	26.62096	1.39	0.165	-15.39667	89.46942
_Ifirm_10	104.4746	26.88333	3.89	0.000	51.52482	157.4244
_Ifirm_11	-5.76391	26.44644	-0.22	0.828	-57.8532	46.32538
_Ifirm_12	728.4282	44.59228	16.34	0.000	640.5986	816.2578
_Ifirm_13	316.5592	37.19844	8.51	0.000	243.2926	389.8258
_Ifirm_14	45.22579	26.55726	1.70	0.090	-7.081774	97.53335
_Ifirm_15	7.636936	26.3159	0.29	0.772	-44.19524	59.46911
_Ifirm_16	-17.19071	26.5002	-0.65	0.517	-69.38588	35.00447
_Ifirm_17	162.666	29.12	5.59	0.000	105.3108	220.0212
_Ifirm_18	-4.152831	26.27204	-0.16	0.875	-55.89862	47.59296
_Ifirm_19	698.0003	28.27181	24.69	0.000	642.3157	753.6849
_Ifirm_20	12.08094	26.28695	0.46	0.646	-39.69423	63.85611
_Ifirm_21	215.6573	26.9503	8.00	0.000	162.5755	268.739
_Ifirm_22	458.4758	44.60324	10.28	0.000	370.6246	546.327
_Ifirm_23	65.31214	26.78595	2.44	0.015	12.55414	118.0702
_Ifirm_24	-18.12411	26.91638	-0.67	0.501	-71.13901	34.8908
_Ifirm_25	30.63467	27.4976	1.11	0.266	-23.52501	84.79435
_Ifirm_26	87.32251	33.16304	2.63	0.009	22.00411	152.6409
_Ifirm_27	47.02315	26.85829	1.75	0.081	-5.877337	99.92363
_Ifirm_28	131.7904	29.55678	4.46	0.000	73.57497	190.0059
_Ifirm_29	82.31845	27.73766	2.97	0.003	27.68596	136.9509
_Ifirm_30	34.3755	26.32395	1.31	0.193	-17.47255	86.22354
_Ifirm_31	19.72391	27.07003	0.73	0.467	-33.59362	73.04143
_cons	43.3653	18.63334	2.33	0.021	6.664795	80.0658

. vif

Variable	VIF	1/VIF
env	8.74	0.114442
_Ifirm_22	5.58	0.179206
_Ifirm_12	5.58	0.179294
_Ifirm_13	3.88	0.257653
_Ifirm_26	3.08	0.324173
_Ifirm_6	2.49	0.402148
_Ifirm_28	2.45	0.408104
_Ifirm_3	2.43	0.411010
_Ifirm_7	2.43	0.411010
_Ifirm_2	2.40	0.417052
_Ifirm_17	2.38	0.420438
_Ifirm_19	2.24	0.446044
_Ifirm_29	2.16	0.463389
_Ifirm_25	2.12	0.471515
_Ifirm_31	2.06	0.486528
_Ifirm_5	2.05	0.487623
_Ifirm_21	2.04	0.490860
_Ifirm_24	2.03	0.492098
_Ifirm_10	2.03	0.493309
_Ifirm_27	2.02	0.494229

```
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of curra

         chi2(1)      =   530.85
         Prob > chi2  =   0.0000

. xtgls curra env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   6558.94
Log likelihood             = -1500.585          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       curra |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   9.197751   1.209134     7.61   0.000     6.827893    11.56761
             |
        firm |
          2  |   484.1754    27.5102    17.60   0.000     430.2564    538.0944
          3  |  -121.2064   27.71168    -4.37   0.000    -175.5203   -66.89252
          4  |   6.586855   25.13545     0.26   0.793    -42.67772    55.85143
          5  |   70.88824   25.44174     2.79   0.005     21.02334    120.7531
          6  |   261.1159   28.01534     9.32   0.000     206.2068    316.0249
          7  |   83.35793   27.71168     3.01   0.003     29.04404    137.6718
          8  |  -19.18373   24.72402    -0.78   0.438    -67.64191    29.27446
          9  |   37.03638   25.04783     1.48   0.139    -12.05647    86.12923
         10  |   104.4746   25.29469     4.13   0.000     54.89794    154.0513
         11  |   -5.76391   24.88362    -0.23   0.817    -54.53491    43.00709
         12  |   728.4282   41.95716    17.36   0.000     646.1937    810.6628
         13  |   316.5592   35.00025     9.04   0.000     247.9599    385.1584
         14  |   45.22579   24.98789     1.81   0.070    -3.749574    94.20115
         15  |   7.636936   24.76079     0.31   0.758    -40.89332     56.1672
         16  |  -17.19071    24.9342    -0.69   0.491    -66.06084    31.67943
         17  |    162.666   27.39919     5.94   0.000     108.9646    216.3674
         18  |  -4.152831   24.71953    -0.17   0.867    -52.60221    44.29655
```

```
          19 |   698.0003   26.60113    26.24   0.000     645.8631    750.1376
          20 |   12.08094   24.73356     0.49   0.625    -36.39595    60.55782
          21 |   215.6573   25.35771     8.50   0.000     165.9571    265.3574
          22 |   458.4758   41.96747    10.92   0.000     376.2211    540.7306
          23 |   65.31214   25.20307     2.59   0.010     15.91503    114.7093
          24 |  -18.12411   25.32579    -0.72   0.474    -67.76175    31.51354
          25 |   30.63467   25.87267     1.18   0.236    -20.07482    81.34416
          26 |   87.32251   31.20331     2.80   0.005     26.16515    148.4799
          27 |   47.02315   25.27113     1.86   0.063    -2.507365    96.55366
          28 |   131.7904   27.81016     4.74   0.000     77.28352    186.2974
          29 |   82.31845   26.09854     3.15   0.002     31.16626    133.4706
          30 |    34.3755   24.76837     1.39   0.165    -14.16963    82.92062
          31 |   19.72391   25.47036     0.77   0.439    -30.19708    69.64489
             |
       _cons |    43.3653   17.53223     2.47   0.013     9.002763    77.72783
------------------------------------------------------------------------------

.
. xi: reg asset env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  251.23
       Model |  86658660.9    31  2795440.68           Prob > F      =  0.0000
    Residual |  2748342.99   247  11126.8947           R-squared     =  0.9693
-------------+------------------------------           Adj R-squared =  0.9654
       Total |  89407003.9   278  321607.928           Root MSE      =  105.48

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   15.25565   2.432604     6.27   0.000     10.46436    20.04694
    _Ifirm_2 |   1079.746   55.34657    19.51   0.000     970.7349    1188.758
    _Ifirm_3 |   -179.602   55.75192    -3.22   0.001    -289.4119   -69.79223
    _Ifirm_4 |   93.54841   50.56892     1.85   0.066    -6.052881    193.1497
    _Ifirm_5 |   291.3419   51.18514     5.69   0.000     190.5269     392.157
    _Ifirm_6 |   752.7271   56.36284    13.36   0.000      641.714    863.7402
    _Ifirm_7 |   190.4655   55.75192     3.42   0.001      80.6557    300.2753
    _Ifirm_8 |  -28.81262   49.74118    -0.58   0.563    -126.7836    69.15835
    _Ifirm_9 |    104.994   50.39265     2.08   0.038     5.739877    204.2481
   _Ifirm_10 |   324.5096    50.8893     6.38   0.000     224.2773    424.7419
   _Ifirm_11 |   67.48015   50.06228     1.35   0.179    -31.12325    166.0835
   _Ifirm_12 |   1748.678   84.41179    20.72   0.000     1582.419    1914.937
   _Ifirm_13 |   909.6141   70.41548    12.92   0.000     770.9228    1048.306
   _Ifirm_14 |   118.7014   50.27205     2.36   0.019     19.68484     217.718
   _Ifirm_15 |   83.39468   49.81517     1.67   0.095    -14.72201    181.5114
   _Ifirm_16 |   5.823682   50.16404     0.12   0.908    -92.98015    104.6275
   _Ifirm_17 |   571.7854   55.12324    10.37   0.000     463.2139     680.357
   _Ifirm_18 |   4.703472   49.73214     0.09   0.925    -93.24969    102.6566
   _Ifirm_19 |   1336.624   53.51765    24.98   0.000     1231.215    1442.033
   _Ifirm_20 |   20.88513   49.76038     0.42   0.675    -77.12364    118.8939
   _Ifirm_21 |    835.081   51.01608    16.37   0.000      734.599     935.563
   _Ifirm_22 |   1316.483   84.43254    15.59   0.000     1150.183    1482.782
   _Ifirm_23 |   258.5392   50.70497     5.10   0.000       158.67    358.4085
   _Ifirm_24 |   26.62032   50.95187     0.52   0.602    -73.73522    126.9759
   _Ifirm_25 |   176.8799    52.0521     3.40   0.001     74.35729    279.4024
   _Ifirm_26 |   325.7749   62.77659     5.19   0.000     202.1292    449.4206
   _Ifirm_27 |   136.2125    50.8419     2.68   0.008     36.07357    236.3515
   _Ifirm_28 |   489.3166   55.95006     8.75   0.000     379.1165    599.5166
   _Ifirm_29 |   229.8452   52.50651     4.38   0.000     126.4276    333.2628
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     _Ifirm_30 |    91.3863   49.83042     1.83   0.068    -6.760426     189.533
     _Ifirm_31 |   111.4998   51.24271     2.18   0.031     10.57137    212.4282
         _cons |   62.01698   35.27233     1.76   0.080    -7.455917    131.4899
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF
-------------+----------------------
         env |      8.74    0.114442
   _Ifirm_22 |      5.58    0.179206
   _Ifirm_12 |      5.58    0.179294
   _Ifirm_13 |      3.88    0.257653
   _Ifirm_26 |      3.08    0.324173
    _Ifirm_6 |      2.49    0.402148
   _Ifirm_28 |      2.45    0.408104
    _Ifirm_3 |      2.43    0.411010
    _Ifirm_7 |      2.43    0.411010
    _Ifirm_2 |      2.40    0.417052
   _Ifirm_17 |      2.38    0.420438
   _Ifirm_19 |      2.24    0.446044
   _Ifirm_29 |      2.16    0.463389
   _Ifirm_25 |      2.12    0.471515
   _Ifirm_31 |      2.06    0.486528
    _Ifirm_5 |      2.05    0.487623
   _Ifirm_21 |      2.04    0.490860
   _Ifirm_24 |      2.03    0.492098
   _Ifirm_10 |      2.03    0.493309
   _Ifirm_27 |      2.02    0.494229
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of asset

         chi2(1)      =   481.71
         Prob > chi2  =   0.0000

. xtgls asset env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   8797.22
Log likelihood             = -1678.628          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       asset |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   15.25565   2.288852     6.67   0.000     10.76958    19.74172
             |
        firm |
          2  |   1079.746   52.07594    20.73   0.000     977.6794    1181.813
          3  |   -179.602   52.45734    -3.42   0.001    -282.4165   -76.78755
          4  |   93.54841   47.58061     1.97   0.049     .2921178    186.8047
          5  |   291.3419   48.16042     6.05   0.000     196.9493    385.7346
          6  |   752.7271   53.03215    14.19   0.000      648.786    856.6682
          7  |   190.4655   52.45734     3.63   0.000     87.65102      293.28
          8  |  -28.81262   46.80179    -0.62   0.538    -120.5424    62.91721
          9  |    104.994   47.41476     2.21   0.027     12.06276    197.9252
         10  |   324.5096   47.88206     6.78   0.000     230.6625    418.3568
         11  |   67.48015   47.10391     1.43   0.152    -24.84182    159.8021
         12  |   1748.678   79.42358    22.02   0.000     1593.011    1904.345
         13  |   909.6141   66.25437    13.73   0.000      779.758     1039.47
         14  |   118.7014   47.30129     2.51   0.012     25.99259    211.4102
         15  |   83.39468    46.8714     1.78   0.075    -8.471585    175.2609
         16  |   5.823682   47.19966     0.12   0.902    -86.68595    98.33332
         17  |   571.7854    51.8658    11.02   0.000     470.1303    673.4406
         18  |   4.703472   46.79329     0.10   0.920    -87.00968    96.41663
         19  |   1336.624    50.3551    26.54   0.000      1237.93    1435.318
         20  |   20.88513   46.81985     0.45   0.656    -70.88009    112.6504
         21  |    835.081   48.00135    17.40   0.000     741.0001    929.1619
         22  |   1316.483   79.44311    16.57   0.000     1160.777    1472.188
         23  |   258.5392   47.70862     5.42   0.000      165.032    352.0464
         24  |   26.62032   47.94093     0.56   0.579    -67.34218    120.5828
         25  |   176.8799   48.97614     3.61   0.000     80.88839    272.8713
         26  |   325.7749   59.06689     5.52   0.000      210.006    441.5439
         27  |   136.2125   47.83746     2.85   0.004     42.45282    229.9722
         28  |   489.3166   52.64376     9.29   0.000     386.1367    592.4964
         29  |   229.8452   49.40371     4.65   0.000     133.0158    326.6747
         30  |    91.3863   46.88575     1.95   0.051    -.508089    183.2807
         31  |   111.4998   48.21459     2.31   0.021     17.00091    205.9986
             |
       _cons |   62.01698   33.18795     1.87   0.062    -3.030217    127.0642
------------------------------------------------------------------------------

.
. xi: reg currl env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  293.57
       Model |  12902839.5    31   416220.63           Prob > F      =  0.0000
    Residual |  350190.211   247  1417.77413           R-squared     =  0.9736
-------------+------------------------------           Adj R-squared =  0.9703
       Total |  13253029.7   278  47672.7688           Root MSE      =  37.653

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

env	2.684933	.8683363	3.09	0.002	.9746446	4.39522
_Ifirm_2	384.9658	19.75637	19.49	0.000	346.0534	423.8783
_Ifirm_3	-40.48338	19.90107	-2.03	0.043	-79.68082	-1.285945
_Ifirm_4	46.3541	18.05096	2.57	0.011	10.80067	81.90753
_Ifirm_5	94.62847	18.27092	5.18	0.000	58.64179	130.6151
_Ifirm_6	381.2053	20.11914	18.95	0.000	341.5783	420.8322
_Ifirm_7	106.8416	19.90107	5.37	0.000	67.64418	146.0391
_Ifirm_8	-2.118047	17.75549	-0.12	0.905	-37.08952	32.85343
_Ifirm_9	36.79838	17.98804	2.05	0.042	1.368881	72.22788
_Ifirm_10	55.48931	18.16532	3.05	0.002	19.71063	91.26799
_Ifirm_11	32.86296	17.87011	1.84	0.067	-2.334261	68.06019
_Ifirm_12	874.1778	30.13142	29.01	0.000	814.8305	933.5251
_Ifirm_13	410.5416	25.13533	16.33	0.000	361.0347	460.0485
_Ifirm_14	63.47891	17.94499	3.54	0.000	28.1342	98.82362
_Ifirm_15	33.18066	17.7819	1.87	0.063	-1.842824	68.20415
_Ifirm_16	-2.582502	17.90643	-0.14	0.885	-37.85127	32.68627
_Ifirm_17	261.4506	19.67665	13.29	0.000	222.6952	300.206
_Ifirm_18	5.137612	17.75226	0.29	0.773	-29.82751	40.10273
_Ifirm_19	288.2617	19.10353	15.09	0.000	250.6351	325.8883
_Ifirm_20	10.43619	17.76234	0.59	0.557	-24.54878	45.42115
_Ifirm_21	366.3685	18.21057	20.12	0.000	330.5007	402.2363
_Ifirm_22	504.2162	30.13883	16.73	0.000	444.8543	563.5781
_Ifirm_23	94.11902	18.09952	5.20	0.000	58.46993	129.7681
_Ifirm_24	13.29672	18.18765	0.73	0.465	-22.52595	49.11939
_Ifirm_25	63.43953	18.58039	3.41	0.001	26.84333	100.0357
_Ifirm_26	232.3409	22.40857	10.37	0.000	188.2046	276.4771
_Ifirm_27	59.0037	18.1484	3.25	0.001	23.25835	94.74906
_Ifirm_28	277.014	19.97179	13.87	0.000	237.6772	316.3507
_Ifirm_29	80.12491	18.74259	4.28	0.000	43.20922	117.0406
_Ifirm_30	12.40623	17.78734	0.70	0.486	-22.62798	47.44045
_Ifirm_31	39.41718	18.29147	2.15	0.032	3.390029	75.44433
_cons	20.77908	12.59072	1.65	0.100	-4.01979	45.57795

. vif

Variable	VIF	1/VIF
env	8.74	0.114442
_Ifirm_22	5.58	0.179206
_Ifirm_12	5.58	0.179294
_Ifirm_13	3.88	0.257653
_Ifirm_26	3.08	0.324173
_Ifirm_6	2.49	0.402148
_Ifirm_28	2.45	0.408104
_Ifirm_3	2.43	0.411010
_Ifirm_7	2.43	0.411010
_Ifirm_2	2.40	0.417052
_Ifirm_17	2.38	0.420438
_Ifirm_19	2.24	0.446044
_Ifirm_29	2.16	0.463389
_Ifirm_25	2.12	0.471515
_Ifirm_31	2.06	0.486528
_Ifirm_5	2.05	0.487623
_Ifirm_21	2.04	0.490860
_Ifirm_24	2.03	0.492098
_Ifirm_10	2.03	0.493309
_Ifirm_27	2.02	0.494229
_Ifirm_23	2.01	0.496902
_Ifirm_4	2.00	0.499579

```
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of currl

         chi2(1)      =   270.79
         Prob > chi2  =   0.0000

. xtgls currl env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =  10279.82
Log likelihood             = -1391.219          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       currl |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.684933   .8170231     3.29   0.001     1.083597    4.286268
             |
        firm |
          2  |   384.9658    18.5889    20.71   0.000     348.5323    421.3994
          3  |  -40.48338   18.72504    -2.16   0.031    -77.18379   -3.782978
          4  |    46.3541   16.98426     2.73   0.006     13.06556    79.64263
          5  |   94.62847   17.19123     5.50   0.000     60.93429    128.3227
          6  |   381.2053   18.93023    20.14   0.000     344.1027    418.3078
          7  |   106.8416   18.72504     5.71   0.000     70.14121     143.542
          8  |  -2.118047   16.70625    -0.13   0.899     -34.8617     30.6256
          9  |   36.79838   16.92506     2.17   0.030     3.625881    69.97088
         10  |   55.48931   17.09186     3.25   0.001     21.98988    88.98874
         11  |   32.86296    16.8141     1.95   0.051    -.0920572    65.81799
         12  |   874.1778   28.35085    30.83   0.000     818.6111    929.7444
         13  |   410.5416   23.64999    17.36   0.000     364.1885    456.8947
         14  |   63.47891   16.88455     3.76   0.000      30.3858    96.57202
         15  |   33.18066    16.7311     1.98   0.047      .388312    65.97302
         16  |  -2.582502   16.84827    -0.15   0.878    -35.60451    30.43951
         17  |   261.4506   18.51389    14.12   0.000      225.164    297.7371
         18  |   5.137612   16.70322     0.31   0.758    -27.60009    37.87531
         19  |   288.2617   17.97463    16.04   0.000     253.0321    323.4913
         20  |   10.43619    16.7127     0.62   0.532     -22.3201    43.19247
```

```
          21 |   366.3685   17.13444    21.38   0.000     332.7856    399.9514
          22 |   504.2162   28.35782    17.78   0.000     448.6359    559.7965
          23 |   94.11902   17.02995     5.53   0.000     60.74092    127.4971
          24 |   13.29672   17.11288     0.78   0.437     -20.2439    46.83734
          25 |   63.43953    17.4824     3.63   0.000     29.17465    97.70441
          26 |   232.3409   21.08437    11.02   0.000     191.0163    273.6655
          27 |    59.0037   17.07594     3.46   0.001     25.53547    92.47194
          28 |    277.014   18.79159    14.74   0.000     240.1831    313.8448
          29 |   80.12491   17.63503     4.54   0.000      45.5609    114.6889
          30 |   12.40623   16.73622     0.74   0.459    -20.39616    45.20863
          31 |   39.41718   17.21056     2.29   0.022     5.685102    73.14926
             |
       _cons |   20.77908   11.84669     1.75   0.079    -2.440003    43.99817
------------------------------------------------------------------------------

.
. xi: reg ltd env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  144.78
       Model |  4028414.69    31  129948.861           Prob > F      =  0.0000
    Residual |  221692.962   247  897.542355           R-squared     =  0.9478
-------------+------------------------------           Adj R-squared =  0.9413
       Total |  4250107.66   278   15288.157           Root MSE      =  29.959

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |  -.3263088   .6908947    -0.47   0.637    -1.687105    1.034488
    _Ifirm_2 |   179.8182   15.71923    11.44   0.000     148.8574    210.7791
    _Ifirm_3 |   3.530012   15.83435     0.22   0.824    -27.65757    34.71759
    _Ifirm_4 |   25.30893   14.36231     1.76   0.079    -2.979283    53.59713
    _Ifirm_5 |   85.14155   14.53732     5.86   0.000     56.50862    113.7745
    _Ifirm_6 |   317.5335   16.00786    19.84   0.000     286.0041    349.0628
    _Ifirm_7 |    28.3619   15.83435     1.79   0.074    -2.825676    59.54948
    _Ifirm_8 |   2.665549   14.12722     0.19   0.850    -25.15962    30.49072
    _Ifirm_9 |   6.340477   14.31224     0.44   0.658    -21.84913    34.53008
   _Ifirm_10 |   26.99364    14.4533     1.87   0.063    -1.473784    55.46107
   _Ifirm_11 |   16.06152   14.21841     1.13   0.260    -11.94327    44.06632
   _Ifirm_12 |   468.2665   23.97417    19.53   0.000     421.0467    515.4864
   _Ifirm_13 |   291.0192   19.99902    14.55   0.000     251.6289    330.4096
   _Ifirm_14 |   20.43717   14.27799     1.43   0.154    -7.684967    48.55931
   _Ifirm_15 |   22.97712   14.14823     1.62   0.106    -4.889437    50.84368
   _Ifirm_16 |   7.343521   14.24731     0.52   0.607     -20.7182    35.40524
   _Ifirm_17 |   83.97364    15.6558     5.36   0.000     53.13775    114.8095
   _Ifirm_18 |   3.212685   14.12465     0.23   0.820    -24.60743     31.0328
   _Ifirm_19 |   63.10746   15.19979     4.15   0.000     33.16973    93.04518
   _Ifirm_20 |   1.145891   14.13267     0.08   0.935    -26.69002     28.9818
   _Ifirm_21 |   262.9123    14.4893    18.15   0.000      234.374    291.4506
   _Ifirm_22 |   353.6098   23.98006    14.75   0.000     306.3783    400.8413
   _Ifirm_23 |   90.27018   14.40095     6.27   0.000     61.90586    118.6345
   _Ifirm_24 |   18.74829   14.47107     1.30   0.196    -9.754143    47.25072
   _Ifirm_25 |   73.10453   14.78355     4.94   0.000     43.98663    102.2224
   _Ifirm_26 |   162.8468   17.82946     9.13   0.000     127.7297     197.964
   _Ifirm_27 |   46.43933   14.43984     3.22   0.001     17.99842    74.88025
   _Ifirm_28 |   218.4299   15.89063    13.75   0.000     187.1315    249.7284
   _Ifirm_29 |   40.50005   14.91261     2.72   0.007     11.12796    69.87215
   _Ifirm_30 |   10.90805   14.15256     0.77   0.442    -16.96705    38.78314
   _Ifirm_31 |   35.81971   14.55367     2.46   0.015     7.154579    64.48483
```

```
       _cons |   .4945569   10.01785     0.05   0.961    -19.23675    20.22587
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.74    0.114442
   _Ifirm_22 |      5.58    0.179206
   _Ifirm_12 |      5.58    0.179294
   _Ifirm_13 |      3.88    0.257653
   _Ifirm_26 |      3.08    0.324173
    _Ifirm_6 |      2.49    0.402148
   _Ifirm_28 |      2.45    0.408104
    _Ifirm_3 |      2.43    0.411010
    _Ifirm_7 |      2.43    0.411010
    _Ifirm_2 |      2.40    0.417052
   _Ifirm_17 |      2.38    0.420438
   _Ifirm_19 |      2.24    0.446044
   _Ifirm_29 |      2.16    0.463389
   _Ifirm_25 |      2.12    0.471515
   _Ifirm_31 |      2.06    0.486528
    _Ifirm_5 |      2.05    0.487623
   _Ifirm_21 |      2.04    0.490860
   _Ifirm_24 |      2.03    0.492098
   _Ifirm_10 |      2.03    0.493309
   _Ifirm_27 |      2.02    0.494229
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of ltd

         chi2(1)      =   333.75
         Prob > chi2  =   0.0000

. xtgls ltd env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
```

```
Estimated coefficients     =        32          Time periods        =         9
                                                Wald chi2(31)       =   5069.75
Log likelihood             = -1327.442          Prob > chi2         =    0.0000

------------------------------------------------------------------------------
         ltd |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |  -.3263088   .6500672    -0.50   0.616    -1.600417    .9477995
             |
        firm |
          2  |   179.8182   14.79032    12.16   0.000     150.8297    208.8067
          3  |   3.530012   14.89864     0.24   0.813    -25.67079    32.73082
          4  |   25.30893   13.51358     1.87   0.061    -1.177212    51.79506
          5  |   85.14155   13.67826     6.22   0.000     58.33266    111.9504
          6  |   317.5335    15.0619    21.08   0.000     288.0127    347.0542
          7  |    28.3619   14.89864     1.90   0.057    -.8389034     57.5627
          8  |   2.665549   13.29239     0.20   0.841    -23.38705    28.71815
          9  |   6.340477   13.46648     0.47   0.638    -20.05334    32.73429
         10  |   26.99364    13.5992     1.98   0.047     .3397044    53.64758
         11  |   16.06152   13.37819     1.20   0.230    -10.15925     42.2823
         12  |   468.2665   22.55745    20.76   0.000     424.0548    512.4783
         13  |   291.0192    18.8172    15.47   0.000     254.1382    327.9003
         14  |   20.43717   13.43425     1.52   0.128    -5.893475    46.76782
         15  |   22.97712   13.31216     1.73   0.084    -3.114227    49.06847
         16  |   7.343521   13.40539     0.55   0.584    -18.93056     33.6176
         17  |   83.97364   14.73064     5.70   0.000     55.10212    112.8452
         18  |   3.212685   13.28997     0.24   0.809    -22.83518    29.26055
         19  |   63.10746   14.30158     4.41   0.000     35.07688    91.13803
         20  |   1.145891   13.29752     0.09   0.931    -24.91676    27.20854
         21  |   262.9123   13.63308    19.28   0.000      236.192    289.6326
         22  |   353.6098   22.56299    15.67   0.000     309.3871    397.8324
         23  |   90.27018   13.54994     6.66   0.000     63.71278    116.8276
         24  |   18.74829   13.61592     1.38   0.169    -7.938425      45.435
         25  |   73.10453   13.90993     5.26   0.000     45.84156    100.3675
         26  |   162.8468   16.77585     9.71   0.000     129.9668    195.7269
         27  |   46.43933   13.58653     3.42   0.001     19.81022    73.06845
         28  |   218.4299   14.95159    14.61   0.000     189.1254    247.7345
         29  |   40.50005   14.03137     2.89   0.004     12.99907    68.00103
         30  |   10.90805   13.31623     0.82   0.413    -15.19129    37.00738
         31  |   35.81971   13.69364     2.62   0.009     8.980661    62.65875
             |
       _cons |   .4945569    9.42586     0.05   0.958    -17.97979     18.9689
------------------------------------------------------------------------------

.
. xi: reg liab env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =  343.40
       Model |  37747981.4    31  1217676.82           Prob > F      =  0.0000
    Residual |  875856.025   247  3545.97581           R-squared     =  0.9773
-------------+------------------------------           Adj R-squared =  0.9745
       Total |  38623837.5   278  138934.667           Root MSE      =  59.548

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.708328   1.373259     1.97   0.050     .0035381    5.413119
    _Ifirm_2 |   706.9766   31.24436    22.63   0.000     645.4373     768.516
```

_Ifirm_3	-39.1153	31.47319	-1.24	0.215	-101.1054	22.87475
_Ifirm_4	92.60609	28.54727	3.24	0.001	36.37897	148.8332
_Ifirm_5	202.0179	28.89514	6.99	0.000	145.1056	258.9302
_Ifirm_6	765.6806	31.81807	24.06	0.000	703.0113	828.35
_Ifirm_7	162.2694	31.47319	5.16	0.000	100.2793	224.2594
_Ifirm_8	3.521673	28.07999	0.13	0.900	-51.78509	58.82844
_Ifirm_9	60.4749	28.44776	2.13	0.035	4.44377	116.506
_Ifirm_10	117.6964	28.72813	4.10	0.000	61.11301	174.2797
_Ifirm_11	56.02822	28.26126	1.98	0.049	.3644329	111.692
_Ifirm_12	1475.801	47.65232	30.97	0.000	1381.945	1569.658
_Ifirm_13	758.981	39.75109	19.09	0.000	680.6867	837.2753
_Ifirm_14	97.39126	28.37968	3.43	0.001	41.49423	153.2883
_Ifirm_15	70.24707	28.12176	2.50	0.013	14.85804	125.6361
_Ifirm_16	11.01252	28.31871	0.39	0.698	-44.76442	66.78946
_Ifirm_17	415.2986	31.11828	13.35	0.000	354.0075	476.5896
_Ifirm_18	12.33821	28.07489	0.44	0.661	-42.95851	67.63493
_Ifirm_19	397.5561	30.21189	13.16	0.000	338.0503	457.0619
_Ifirm_20	12.31061	28.09083	0.44	0.662	-43.0175	67.63872
_Ifirm_21	707.3096	28.7997	24.56	0.000	650.5853	764.0339
_Ifirm_22	984.7494	47.66403	20.66	0.000	890.8696	1078.629
_Ifirm_23	212.2822	28.62407	7.42	0.000	155.9038	268.6606
_Ifirm_24	36.56775	28.76345	1.27	0.205	-20.08517	93.22067
_Ifirm_25	155.4337	29.38455	5.29	0.000	97.5574	213.3099
_Ifirm_26	418.3635	35.43877	11.81	0.000	348.5627	488.1642
_Ifirm_27	107.9717	28.70137	3.76	0.000	51.44105	164.5023
_Ifirm_28	526.033	31.58504	16.65	0.000	463.8226	588.2433
_Ifirm_29	142.9654	29.64108	4.82	0.000	84.58391	201.3469
_Ifirm_30	47.62473	28.13037	1.69	0.092	-7.781258	103.0307
_Ifirm_31	82.75815	28.92764	2.86	0.005	25.78185	139.7345
_cons	22.05742	19.91201	1.11	0.269	-17.16156	61.2764

. vif

Variable	VIF	1/VIF
env	8.74	0.114442
_Ifirm_22	5.58	0.179206
_Ifirm_12	5.58	0.179294
_Ifirm_13	3.88	0.257653
_Ifirm_26	3.08	0.324173
_Ifirm_6	2.49	0.402148
_Ifirm_28	2.45	0.408104
_Ifirm_3	2.43	0.411010
_Ifirm_7	2.43	0.411010
_Ifirm_2	2.40	0.417052
_Ifirm_17	2.38	0.420438
_Ifirm_19	2.24	0.446044
_Ifirm_29	2.16	0.463389
_Ifirm_25	2.12	0.471515
_Ifirm_31	2.06	0.486528
_Ifirm_5	2.05	0.487623
_Ifirm_21	2.04	0.490860
_Ifirm_24	2.03	0.492098
_Ifirm_10	2.03	0.493309
_Ifirm_27	2.02	0.494229
_Ifirm_23	2.01	0.496902
_Ifirm_4	2.00	0.499579
_Ifirm_9	1.99	0.503081
_Ifirm_14	1.98	0.505497

```
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of liab

         chi2(1)      =   340.69
         Prob > chi2  =   0.0000

. xtgls liab env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =  12024.45
Log likelihood             = -1519.102          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        liab |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   2.708328   1.292108     2.10   0.036      .175844    5.240813
             |
        firm |
          2  |   706.9766   29.39801    24.05   0.000     649.3576    764.5957
          3  |   -39.1153   29.61332    -1.32   0.187    -97.15635    18.92574
          4  |   92.60609   26.86031     3.45   0.001     39.96086    145.2513
          5  |   202.0179   27.18762     7.43   0.000     148.7311    255.3046
          6  |   765.6806   29.93782    25.58   0.000     707.0036    824.3577
          7  |   162.2694   29.61332     5.48   0.000     104.2283    220.3104
          8  |   3.521673   26.42064     0.13   0.894    -48.26183    55.30518
          9  |    60.4749   26.76668     2.26   0.024     8.013176    112.9366
         10  |   117.6964   27.03048     4.35   0.000     64.71759    170.6751
         11  |   56.02822    26.5912     2.11   0.035     3.910438     108.146
         12  |   1475.801   44.83636    32.92   0.000     1387.924    1563.679
         13  |    758.981   37.40205    20.29   0.000     685.6743    832.2877
         14  |   97.39126   26.70262     3.65   0.000     45.05509    149.7274
         15  |   70.24707   26.45994     2.65   0.008     18.38654    122.1076
         16  |   11.01252   26.64525     0.41   0.679     -41.2112    63.23625
         17  |   415.2986   29.27939    14.18   0.000      357.912    472.6851
         18  |   12.33821   26.41584     0.47   0.640    -39.43589    64.11231
         19  |   397.5561   28.42656    13.99   0.000      341.841    453.2711
         20  |   12.31061   26.43084     0.47   0.641    -39.49288     64.1141
         21  |   707.3096   27.09782    26.10   0.000     654.1989    760.4204
         22  |   984.7494   44.84739    21.96   0.000     896.8501    1072.649
```

	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
23	212.2822	26.93257	7.88	0.000	159.4953	265.0691
24	36.56775	27.06371	1.35	0.177	-16.47615	89.61165
25	155.4337	27.64811	5.62	0.000	101.2443	209.623
26	418.3635	33.34456	12.55	0.000	353.0093	483.7176
27	107.9717	27.0053	4.00	0.000	55.04227	160.9011
28	526.033	29.71856	17.70	0.000	467.7857	584.2803
29	142.9654	27.88948	5.13	0.000	88.30304	197.6278
30	47.62473	26.46804	1.80	0.072	-4.251675	99.50114
31	82.75815	27.2182	3.04	0.002	29.41146	136.1048
_cons	22.05742	18.73533	1.18	0.239	-14.66316	58.77799

```
.
. xi: reg oe env i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)
```

Source	SS	df	MS
Model	15897401.9	31	512819.416
Residual	1349155.63	247	5462.16855
Total	17246557.5	278	62037.9767

Number of obs	= 279
F(31, 247)	= 93.89
Prob > F	= 0.0000
R-squared	= 0.9218
Adj R-squared	= 0.9120
Root MSE	= 73.906

oe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
env	12.54732	1.704382	7.36	0.000	9.190348	15.9043
_Ifirm_2	372.7697	38.77808	9.61	0.000	296.3918	449.1475
_Ifirm_3	-140.4867	39.06208	-3.60	0.000	-217.424	-63.54949
_Ifirm_4	.9423169	35.43066	0.03	0.979	-68.84243	70.72707
_Ifirm_5	89.32408	35.86241	2.49	0.013	18.68894	159.9592
_Ifirm_6	-12.95355	39.49012	-0.33	0.743	-90.73387	64.82677
_Ifirm_7	28.19614	39.06208	0.72	0.471	-48.74111	105.1334
_Ifirm_8	-32.33429	34.85071	-0.93	0.354	-100.9768	36.30819
_Ifirm_9	44.51908	35.30716	1.26	0.209	-25.02242	114.0606
_Ifirm_10	206.8133	35.65513	5.80	0.000	136.5864	277.0401
_Ifirm_11	11.45192	35.07568	0.33	0.744	-57.63367	80.53751
_Ifirm_12	272.8767	59.14236	4.61	0.000	156.389	389.3644
_Ifirm_13	150.6331	49.33597	3.05	0.003	53.46029	247.806
_Ifirm_14	21.31015	35.22266	0.61	0.546	-48.06492	90.68522
_Ifirm_15	13.1476	34.90255	0.38	0.707	-55.59697	81.89218
_Ifirm_16	-5.188843	35.14698	-0.15	0.883	-74.41486	64.03718
_Ifirm_17	156.4869	38.6216	4.05	0.000	80.41719	232.5565
_Ifirm_18	-7.634737	34.84438	-0.22	0.827	-76.26474	60.99527
_Ifirm_19	939.0678	37.49666	25.04	0.000	865.2139	1012.922
_Ifirm_20	8.574525	34.86416	0.25	0.806	-60.09444	77.24349
_Ifirm_21	127.7714	35.74396	3.57	0.000	57.36954	198.1732
_Ifirm_22	331.7334	59.1569	5.61	0.000	215.2171	448.2497
_Ifirm_23	46.25701	35.52598	1.30	0.194	-23.71548	116.2295
_Ifirm_24	-9.947427	35.69897	-0.28	0.781	-80.26064	60.36579
_Ifirm_25	21.4462	36.46983	0.59	0.557	-50.38532	93.27773
_Ifirm_26	-92.58854	43.98385	-2.11	0.036	-179.2198	-5.957301
_Ifirm_27	28.24082	35.62192	0.79	0.429	-41.92064	98.40228
_Ifirm_28	-36.71643	39.20091	-0.94	0.350	-113.9271	40.49425
_Ifirm_29	86.87982	36.78822	2.36	0.019	14.42121	159.3384
_Ifirm_30	43.76157	34.91324	1.25	0.211	-25.00406	112.5272
_Ifirm_31	28.74162	35.90275	0.80	0.424	-41.97296	99.4562
_cons	39.95956	24.71324	1.62	0.107	-8.716002	88.63512

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         env |      8.74    0.114442
   _Ifirm_22 |      5.58    0.179206
   _Ifirm_12 |      5.58    0.179294
   _Ifirm_13 |      3.88    0.257653
   _Ifirm_26 |      3.08    0.324173
    _Ifirm_6 |      2.49    0.402148
   _Ifirm_28 |      2.45    0.408104
    _Ifirm_3 |      2.43    0.411010
    _Ifirm_7 |      2.43    0.411010
    _Ifirm_2 |      2.40    0.417052
   _Ifirm_17 |      2.38    0.420438
   _Ifirm_19 |      2.24    0.446044
   _Ifirm_29 |      2.16    0.463389
   _Ifirm_25 |      2.12    0.471515
   _Ifirm_31 |      2.06    0.486528
    _Ifirm_5 |      2.05    0.487623
   _Ifirm_21 |      2.04    0.490860
   _Ifirm_24 |      2.03    0.492098
   _Ifirm_10 |      2.03    0.493309
   _Ifirm_27 |      2.02    0.494229
   _Ifirm_23 |      2.01    0.496902
    _Ifirm_4 |      2.00    0.499579
    _Ifirm_9 |      1.99    0.503081
   _Ifirm_14 |      1.98    0.505497
   _Ifirm_16 |      1.97    0.507676
   _Ifirm_11 |      1.96    0.509742
   _Ifirm_30 |      1.94    0.514497
   _Ifirm_15 |      1.94    0.514812
   _Ifirm_20 |      1.94    0.515946
    _Ifirm_8 |      1.94    0.516345
   _Ifirm_18 |      1.94    0.516532
-------------+----------------------
    Mean VIF |      2.64

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of oe

         chi2(1)      =   691.27
         Prob > chi2  =   0.0000

. xtgls oe env i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   3287.52
```

```
Log likelihood            = -1579.371         Prob > chi2        =    0.0000

------------------------------------------------------------------------------
          oe |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         env |   12.54732   1.603664     7.82   0.000     9.404201    15.69045
             |
        firm |
          2  |   372.7697   36.48654    10.22   0.000     301.2574     444.282
          3  |  -140.4867   36.75376    -3.82   0.000    -212.5228    -68.4507
          4  |   .9423169   33.33693     0.03   0.977    -64.39687     66.2815
          5  |   89.32408   33.74317     2.65   0.008     23.18868    155.4595
          6  |  -12.95355    37.1565    -0.35   0.727    -85.77896    59.87185
          7  |   28.19614   36.75376     0.77   0.443    -43.83991    100.2322
          8  |  -32.33429   32.79125    -0.99   0.324    -96.60397    31.93539
          9  |   44.51908   33.22073     1.34   0.180    -20.59234    109.6305
         10  |   206.8133   33.54813     6.16   0.000     141.0601    272.5664
         11  |   11.45192   33.00293     0.35   0.729    -53.23264    76.13648
         12  |   272.8767   55.64742     4.90   0.000     163.8098    381.9436
         13  |   150.6331   46.42053     3.24   0.001     59.65059    241.6157
         14  |   21.31015   33.14122     0.64   0.520    -43.64545    86.26575
         15  |    13.1476   32.84003     0.40   0.689    -51.21767    77.51288
         16  |  -5.188843   33.07002    -0.16   0.875    -70.00489     59.6272
         17  |   156.4869   36.33931     4.31   0.000     85.26313    227.7106
         18  |  -7.634737    32.7853    -0.23   0.816    -71.89274    56.62326
         19  |   939.0678   35.28085    26.62   0.000     869.9187    1008.217
         20  |   8.574525   32.80391     0.26   0.794    -55.71996      72.869
         21  |   127.7714   33.63171     3.80   0.000     61.85441    193.6883
         22  |   331.7334    55.6611     5.96   0.000     222.6396    440.8271
         23  |   46.25701   33.42662     1.38   0.166    -19.25796     111.772
         24  |  -9.947427   33.58938    -0.30   0.767    -75.78141    55.88656
         25  |    21.4462    34.3147     0.62   0.532    -45.80936    88.70177
         26  |  -92.58854   41.38468    -2.24   0.025     -173.701   -11.47606
         27  |   28.24082   33.51689     0.84   0.399    -37.45107    93.93272
         28  |  -36.71643   36.88438    -1.00   0.320    -109.0085    35.57562
         29  |   86.87982   34.61426     2.51   0.012     19.03711    154.7225
         30  |   43.76157   32.85008     1.33   0.183    -20.62341    108.1465
         31  |   28.74162   33.78112     0.85   0.395    -37.46816     94.9514
             |
       _cons |   39.95956   23.25284     1.72   0.086    -5.615175    85.53429
------------------------------------------------------------------------------

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Dependent 2001-2009.log
  log type:  text
 closed on:   8 Jul 2012, 21:07:18
```

Appendix M: Environment as the Independent Variable 2001-2009

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Independent 2001-2009.log
  log type:  text
 opened on:   8 Jul 2012, 21:07:34

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2009
                delta:  1 unit

.
. xi: reg env revtot i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   88.06
       Model |  15066.9647    31  486.03112           Prob > F      =  0.0000
    Residual |  1363.31994   247  5.51951392           R-squared     =  0.9170
-------------+------------------------------           Adj R-squared =  0.9066
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.3494

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |    .010148   .0010485     9.68   0.000     .0080828    .0122133
    _Ifirm_2 |  -3.384425   1.770963    -1.91   0.057    -6.872541    .1036903
    _Ifirm_3 |   10.90197   1.108895     9.83   0.000     8.717876    13.08607
    _Ifirm_4 |   2.780495    1.11231     2.50   0.013     .5896726    4.971317
    _Ifirm_5 |   2.627862   1.134049     2.32   0.021     .3942232    4.861501
    _Ifirm_6 |   1.739328   1.457423     1.19   0.234    -1.131234    4.609891
    _Ifirm_7 |   5.645338   1.210075     4.67   0.000     3.261956    8.028719
    _Ifirm_8 |  -.0506063    1.10852    -0.05   0.964    -2.233963    2.132751
    _Ifirm_9 |   2.173009   1.114263     1.95   0.052    -.0216591    4.367677
   _Ifirm_10 |   1.760557   1.141782     1.54   0.124    -.4883133    4.009426
   _Ifirm_11 |   1.859439   1.108819     1.68   0.095    -.3245064    4.043385
   _Ifirm_12 |   5.940014   2.537906     2.34   0.020     .9413171    10.93871
   _Ifirm_13 |    8.20806   1.684748     4.87   0.000     4.889756    11.52636
   _Ifirm_14 |   1.771455   1.115213     1.59   0.113    -.4250841    3.967995
   _Ifirm_15 |   .6762303   1.108962     0.61   0.543    -1.507997    2.860457
   _Ifirm_16 |   2.587798   1.107586     2.34   0.020     .4062812    4.769315
   _Ifirm_17 |   1.734827   1.384721     1.25   0.211    -.9925404    4.462194
   _Ifirm_18 |  -.0553431   1.107863    -0.05   0.960    -2.237407    2.126721
   _Ifirm_19 |   -1.32623   1.477153    -0.90   0.370    -4.235652    1.583192
   _Ifirm_20 |  -.7518693   1.107502    -0.68   0.498    -2.933221    1.429483
   _Ifirm_21 |  -2.579406   1.338007    -1.93   0.055    -5.214765    .0559528
   _Ifirm_22 |   14.68224   1.770471     8.29   0.000      11.1951    18.16939
   _Ifirm_23 |   1.452827   1.140204     1.27   0.204     -.792935     3.69859
   _Ifirm_24 |   3.986006   1.109129     3.59   0.000     1.801448    6.170563
   _Ifirm_25 |   4.614127    1.12153     4.11   0.000     2.405145    6.823108
   _Ifirm_26 |   10.57743   1.229796     8.60   0.000     8.155203    12.99965
   _Ifirm_27 |   2.905454   1.117589     2.60   0.010     .7042346    5.106674
   _Ifirm_28 |   5.469227   1.225314     4.46   0.000      3.05583    7.882624
```

```
   _Ifirm_29 |   3.522494   1.162157     3.03   0.003     1.233493    5.811496
   _Ifirm_30 |   .8841995   1.108448     0.80   0.426    -1.299015    3.067414
   _Ifirm_31 |    3.80098   1.115452     3.41   0.001     1.603969    5.997991
       _cons |   .2467503   .7886536     0.31   0.755    -1.306594    1.800094
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
      revtot |     16.00    0.062499
   _Ifirm_12 |     10.16    0.098389
    _Ifirm_2 |      4.95    0.202060
   _Ifirm_22 |      4.95    0.202172
   _Ifirm_13 |      4.48    0.223269
   _Ifirm_19 |      3.44    0.290434
    _Ifirm_6 |      3.35    0.298351
   _Ifirm_17 |      3.03    0.330502
   _Ifirm_21 |      2.82    0.353983
   _Ifirm_26 |      2.39    0.419018
   _Ifirm_28 |      2.37    0.422089
    _Ifirm_7 |      2.31    0.432787
   _Ifirm_29 |      2.13    0.469212
   _Ifirm_10 |      2.06    0.486108
   _Ifirm_23 |      2.05    0.487454
    _Ifirm_5 |      2.03    0.492760
   _Ifirm_25 |      1.98    0.503822
   _Ifirm_27 |      1.97    0.507382
   _Ifirm_31 |      1.96    0.509327
   _Ifirm_14 |      1.96    0.509546
    _Ifirm_9 |      1.96    0.510415
    _Ifirm_4 |      1.95    0.512209
   _Ifirm_24 |      1.94    0.515151
   _Ifirm_15 |      1.94    0.515307
    _Ifirm_3 |      1.94    0.515369
   _Ifirm_11 |      1.94    0.515439
    _Ifirm_8 |      1.94    0.515717
   _Ifirm_30 |      1.94    0.515785
   _Ifirm_18 |      1.94    0.516329
   _Ifirm_16 |      1.94    0.516588
   _Ifirm_20 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      3.15

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   129.95
         Prob > chi2  =   0.0000

. xtgls env revtot i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
```

```
Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   3083.42
Log likelihood             = -617.1959          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      revtot |    .010148   .0009866    10.29   0.000     .0082144    .0120817
             |
        firm |
          2  |  -3.384425   1.666311    -2.03   0.042    -6.650334   -.1185166
          3  |   10.90197   1.043366    10.45   0.000     8.857011    12.94693
          4  |   2.780495    1.04658     2.66   0.008     .7292367    4.831753
          5  |   2.627862   1.067034     2.46   0.014     .5365149    4.719209
          6  |   1.739328   1.371299     1.27   0.205    -.9483681    4.427025
          7  |   5.645338   1.138567     4.96   0.000     3.413787    7.876888
          8  |  -.0506063   1.043013    -0.05   0.961    -2.094875    1.993662
          9  |   2.173009   1.048417     2.07   0.038     .1181499    4.227868
         10  |   1.760557   1.074309     1.64   0.101    -.3450513    3.866164
         11  |   1.859439   1.043295     1.78   0.075    -.1853804    3.904259
         12  |   5.940014   2.387932     2.49   0.013     1.259754    10.62027
         13  |    8.20806    1.58519     5.18   0.000     5.101145    11.31497
         14  |   1.771455   1.049311     1.69   0.091    -.2851558    3.828067
         15  |   .6762303   1.043429     0.65   0.517    -1.368853    2.721313
         16  |   2.587798   1.042134     2.48   0.013     .5452525    4.630344
         17  |   1.734827   1.302893     1.33   0.183    -.8187963    4.288449
         18  |  -.0553431   1.042396    -0.05   0.958    -2.098401    1.987715
         19  |   -1.32623   1.389863    -0.95   0.340     -4.05031    1.397851
         20  |  -.7518693   1.042055    -0.72   0.471     -2.79426    1.290522
         21  |  -2.579406   1.258939    -2.05   0.040    -5.046882     -.11193
         22  |   14.68224   1.665847     8.81   0.000     11.41724    17.94724
         23  |   1.452827   1.072825     1.35   0.176     -.649871    3.555526
         24  |   3.986006   1.043587     3.82   0.000     1.940613    6.031398
         25  |   4.614127   1.055254     4.37   0.000     2.545866    6.682387
         26  |   10.57743   1.157123     9.14   0.000     8.309509    12.84535
         27  |   2.905454   1.051546     2.76   0.006     .8444611    4.966447
         28  |   5.469227   1.152906     4.74   0.000     3.209573    7.728881
         29  |   3.522494   1.093481     3.22   0.001     1.379311    5.665677
         30  |   .8841995   1.042945     0.85   0.397    -1.159936    2.928335
         31  |    3.80098   1.049536     3.62   0.000     1.743927    5.858032
             |
       _cons |   .2467503   .7420492     0.33   0.739    -1.207639     1.70114
------------------------------------------------------------------------------

.
. xi: reg env cos i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   86.34
       Model |  15042.1446    31  485.230471           Prob > F      =  0.0000
    Residual |  1388.14006   247  5.62000025           R-squared     =  0.9155
-------------+------------------------------           Adj R-squared =  0.9049
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.3707

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

cos	.0118044	.0012614	9.36	0.000	.0093199	.0142888
_Ifirm_2	-.8448728	1.609171	-0.53	0.600	-4.014319	2.324573
_Ifirm_3	10.8349	1.118669	9.69	0.000	8.631552	13.03824
_Ifirm_4	3.073172	1.12009	2.74	0.007	.867027	5.279317
_Ifirm_5	3.165784	1.134388	2.79	0.006	.9314758	5.400091
_Ifirm_6	2.990203	1.401707	2.13	0.034	.2293813	5.751025
_Ifirm_7	6.574441	1.188646	5.53	0.000	4.233267	8.915615
_Ifirm_8	-.1520269	1.118193	-0.14	0.892	-2.354437	2.050383
_Ifirm_9	2.4699	1.12157	2.20	0.029	.2608389	4.678962
_Ifirm_10	2.4605	1.137539	2.16	0.032	.2199869	4.701013
_Ifirm_11	2.012312	1.118237	1.80	0.073	-.1901838	4.214807
_Ifirm_12	8.971915	2.323943	3.86	0.000	4.394642	13.54919
_Ifirm_13	9.434476	1.626606	5.80	0.000	6.230688	12.63826
_Ifirm_14	2.132096	1.121727	1.90	0.059	-.0772736	4.341466
_Ifirm_15	.7861489	1.118529	0.70	0.483	-1.416922	2.98922
_Ifirm_16	2.611155	1.117598	2.34	0.020	.4099179	4.812392
_Ifirm_17	3.325599	1.313196	2.53	0.012	.7391085	5.912089
_Ifirm_18	-.0807246	1.117853	-0.07	0.942	-2.282465	2.121016
_Ifirm_19	1.282772	1.335978	0.96	0.338	-1.348591	3.914134
_Ifirm_20	-.7361668	1.117541	-0.66	0.511	-2.937292	1.464958
_Ifirm_21	-2.050175	1.329352	-1.54	0.124	-4.668486	.5681357
_Ifirm_22	17.45628	1.590772	10.97	0.000	14.32308	20.58949
_Ifirm_23	2.110759	1.137112	1.86	0.065	-.1289142	4.350433
_Ifirm_24	4.159514	1.118387	3.72	0.000	1.956723	6.362305
_Ifirm_25	5.196327	1.124033	4.62	0.000	2.982415	7.410238
_Ifirm_26	11.21962	1.217963	9.21	0.000	8.820706	13.61854
_Ifirm_27	3.086886	1.125728	2.74	0.007	.8696348	5.304137
_Ifirm_28	6.043442	1.216582	4.97	0.000	3.647245	8.43964
_Ifirm_29	4.269337	1.153168	3.70	0.000	1.998039	6.540634
_Ifirm_30	1.165336	1.117671	1.04	0.298	-1.036046	3.366718
_Ifirm_31	3.96556	1.123951	3.53	0.000	1.751809	6.179311
_cons	.4030494	.7942305	0.51	0.612	-1.161279	1.967377

```
. vif
```

Variable	VIF	1/VIF
cos	12.38	0.080788
_Ifirm_12	8.37	0.119477
_Ifirm_13	4.10	0.243876
_Ifirm_2	4.01	0.249190
_Ifirm_22	3.92	0.254987
_Ifirm_6	3.04	0.328413
_Ifirm_19	2.77	0.361523
_Ifirm_21	2.74	0.365136
_Ifirm_17	2.67	0.374175
_Ifirm_26	2.30	0.434977
_Ifirm_28	2.29	0.435965
_Ifirm_7	2.19	0.456698
_Ifirm_29	2.06	0.485231
_Ifirm_10	2.01	0.498657
_Ifirm_23	2.00	0.499031
_Ifirm_5	1.99	0.501431
_Ifirm_27	1.96	0.509175
_Ifirm_25	1.96	0.510712
_Ifirm_31	1.96	0.510786
_Ifirm_14	1.95	0.512814
_Ifirm_9	1.95	0.512957

```
    _Ifirm_4 |      1.94    0.514314
    _Ifirm_3 |      1.94    0.515622
   _Ifirm_15 |      1.94    0.515751
   _Ifirm_24 |      1.94    0.515882
   _Ifirm_11 |      1.94    0.516020
    _Ifirm_8 |      1.94    0.516061
   _Ifirm_18 |      1.94    0.516374
   _Ifirm_30 |      1.94    0.516543
   _Ifirm_16 |      1.94    0.516610
   _Ifirm_20 |      1.94    0.516663
-------------+----------------------
    Mean VIF |      2.84

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   141.58
         Prob > chi2  =   0.0000

. xtgls env cos i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   3023.30
Log likelihood             = -619.7128          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         cos |   .0118044   .0011869     9.95   0.000     .0094782    .0141306
             |
        firm |
          2  |  -.8448728   1.514079    -0.56   0.577    -3.812413    2.122667
          3  |    10.8349   1.052562    10.29   0.000     8.771914    12.89788
          4  |   3.073172   1.053899     2.92   0.004     1.007567    5.138777
          5  |   3.165784   1.067353     2.97   0.003      1.07381    5.257757
          6  |   2.990203   1.318875     2.27   0.023     .4052566     5.57515
          7  |   6.574441   1.118404     5.88   0.000     4.382409    8.766473
          8  |  -.1520269   1.052115    -0.14   0.885    -2.214134     1.91008
          9  |     2.4699   1.055293     2.34   0.019     .4015649    4.538236
         10  |     2.4605   1.070317     2.30   0.022     .3627165    4.558284
         11  |   2.012312   1.052156     1.91   0.056    -.0498761    4.074499
         12  |   8.971915   2.186613     4.10   0.000     4.686232     13.2576
         13  |   9.434476   1.530484     6.16   0.000     6.434782    12.43417
         14  |   2.132096    1.05544     2.02   0.043      .063472     4.20072
         15  |   .7861489   1.052431     0.75   0.455    -1.276578    2.848876
         16  |   2.611155   1.051555     2.48   0.013     .5501455    4.672165
         17  |   3.325599   1.235594     2.69   0.007     .9038782    5.747319
         18  |  -.0807246   1.051795    -0.08   0.939    -2.142205    1.980756
         19  |   1.282772    1.25703     1.02   0.308    -1.180962    3.746506
```

```
          20 |  -.7361668   1.051501    -0.70   0.484    -2.797071    1.324738
          21 |  -2.050175   1.250795    -1.64   0.101    -4.501689    .4013389
          22 |   17.45628   1.496767    11.66   0.000     14.52267    20.38989
          23 |   2.110759   1.069916     1.97   0.049     .0137619    4.207756
          24 |   4.159514   1.052297     3.95   0.000     2.097049    6.221979
          25 |   5.196327   1.057609     4.91   0.000      3.12345    7.269203
          26 |   11.21962   1.145989     9.79   0.000     8.973527    13.46572
          27 |   3.086886   1.059205     2.91   0.004     1.010883    5.162889
          28 |   6.043442   1.144689     5.28   0.000     3.799892    8.286992
          29 |   4.269337   1.085023     3.93   0.000      2.14273    6.395944
          30 |   1.165336   1.051624     1.11   0.268    -.8958087    3.226481
          31 |    3.96556   1.057533     3.75   0.000     1.892834    6.038286
             |
       _cons |   .4030494   .7472965     0.54   0.590    -1.061625    1.867724
------------------------------------------------------------------------------

.
. xi: reg env ni i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   64.42
       Model |   14621.754    31  471.669485           Prob > F      =  0.0000
    Residual |  1808.53063   247  7.32198635           R-squared     =  0.8899
-------------+------------------------------           Adj R-squared =  0.8761
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.7059

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |   .0238294   .0076103     3.13   0.002     .0088399    .0388188
    _Ifirm_2 |   9.443431   1.287479     7.33   0.000     6.907593    11.97927
    _Ifirm_3 |   10.47466    1.27607     8.21   0.000     7.961289    12.98802
    _Ifirm_4 |   3.708914   1.275786     2.91   0.004     1.196107    6.221721
    _Ifirm_5 |   4.915775   1.275795     3.85   0.000     2.402951    7.428599
    _Ifirm_6 |   10.75977   1.276462     8.43   0.000     8.245635    13.27391
    _Ifirm_7 |   10.04445    1.27966     7.85   0.000     7.524008    12.56488
    _Ifirm_8 |  -.4007791   1.276062    -0.31   0.754     -2.91413    2.112572
    _Ifirm_9 |   3.258175    1.27599     2.55   0.011     .7449672    5.771383
   _Ifirm_10 |   4.218621   1.277683     3.30   0.001     1.702077    6.735165
   _Ifirm_11 |   2.408381   1.275608     1.89   0.060    -.1040757    4.920838
   _Ifirm_12 |   27.22496   1.301883    20.91   0.000     24.66075    29.78917
   _Ifirm_13 |   20.32152   1.276787    15.92   0.000     17.80674     22.8363
   _Ifirm_14 |   3.027811   1.275586     2.37   0.018     .5153979    5.540224
   _Ifirm_15 |   1.233879   1.275583     0.97   0.334    -1.278529    3.746287
   _Ifirm_16 |   2.778225   1.275716     2.18   0.030     .2655565    5.290894
   _Ifirm_17 |   9.851266   1.275788     7.72   0.000     7.338455    12.36408
   _Ifirm_18 |  -.2567198   1.275794    -0.20   0.841    -2.769542    2.256102
   _Ifirm_19 |   5.652189   1.501742     3.76   0.000     2.694335    8.610043
   _Ifirm_20 |  -.7424832     1.2756    -0.58   0.561    -3.254923    1.769956
   _Ifirm_21 |   4.701329    1.27559     3.69   0.000     2.188909     7.21375
   _Ifirm_22 |   27.15445   1.307307    20.77   0.000     24.57956    29.72934
   _Ifirm_23 |   3.933447   1.276403     3.08   0.002     1.419426    6.447468
   _Ifirm_24 |   4.588735     1.2756     3.60   0.000     2.076295    7.101174
   _Ifirm_25 |   6.256495   1.275772     4.90   0.000     3.743716    8.769275
   _Ifirm_26 |   15.58412   1.276705    12.21   0.000     13.06951    18.09874
   _Ifirm_27 |    4.39211   1.275635     3.44   0.001       1.8796     6.90462
   _Ifirm_28 |    10.4312   1.276081     8.17   0.000      7.91781    12.94459
   _Ifirm_29 |   6.685062   1.278002     5.23   0.000     4.167891    9.202233
   _Ifirm_30 |   1.322033   1.275583     1.04   0.301    -1.190374    3.834439
```

```
   _Ifirm_31 |   5.019941   1.275765     3.93   0.000     2.507176    7.532706
       _cons |   1.032435   .9027432     1.14   0.254    -.7456216    2.810491
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
   _Ifirm_19 |      2.68    0.372766
   _Ifirm_22 |      2.03    0.491894
   _Ifirm_12 |      2.02    0.496001
    _Ifirm_2 |      1.97    0.507162
    _Ifirm_7 |      1.95    0.513378
   _Ifirm_29 |      1.94    0.514712
   _Ifirm_10 |      1.94    0.514968
   _Ifirm_13 |      1.94    0.515691
   _Ifirm_26 |      1.94    0.515758
    _Ifirm_6 |      1.94    0.515954
   _Ifirm_23 |      1.94    0.516002
   _Ifirm_28 |      1.94    0.516262
    _Ifirm_3 |      1.94    0.516271
    _Ifirm_8 |      1.94    0.516277
    _Ifirm_9 |      1.94    0.516336
    _Ifirm_5 |      1.94    0.516494
   _Ifirm_18 |      1.94    0.516495
   _Ifirm_17 |      1.94    0.516499
    _Ifirm_4 |      1.94    0.516501
   _Ifirm_25 |      1.94    0.516512
   _Ifirm_31 |      1.94    0.516518
   _Ifirm_16 |      1.94    0.516558
   _Ifirm_27 |      1.94    0.516623
   _Ifirm_11 |      1.94    0.516645
   _Ifirm_24 |      1.94    0.516652
   _Ifirm_20 |      1.94    0.516652
   _Ifirm_21 |      1.94    0.516660
   _Ifirm_14 |      1.94    0.516663
   _Ifirm_15 |      1.94    0.516665
   _Ifirm_30 |      1.94    0.516666
          ni |      1.89    0.528584
-------------+----------------------
    Mean VIF |      1.97

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   182.00
         Prob > chi2  =   0.0000

. xtgls env ni i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
```

```
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   2255.68
Log likelihood             = -656.6175          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ni |   .0238294   .0071606     3.33   0.001     .0097948    .0378639
             |
        firm |
          2  |   9.443431   1.211397     7.80   0.000     7.069136    11.81773
          3  |   10.47466   1.200662     8.72   0.000     8.121401    12.82791
          4  |   3.708914   1.200395     3.09   0.002     1.356183    6.061645
          5  |   4.915775   1.200403     4.10   0.000     2.563028    7.268522
          6  |   10.75977   1.201031     8.96   0.000     8.405795    13.11375
          7  |   10.04445   1.204041     8.34   0.000      7.68457    12.40432
          8  |  -.4007791   1.200655    -0.33   0.739     -2.75402    1.952461
          9  |   3.258175   1.200587     2.71   0.007     .9050685    5.611282
         10  |   4.218621    1.20218     3.51   0.000     1.862391    6.574851
         11  |   2.408381   1.200228     2.01   0.045     .0559778    4.760785
         12  |   27.22496    1.22495    22.23   0.000      24.8241    29.62582
         13  |   20.32152   1.201337    16.92   0.000     17.96694     22.6761
         14  |   3.027811   1.200207     2.52   0.012     .6754487    5.380174
         15  |   1.233879   1.200204     1.03   0.304    -1.118479    3.586236
         16  |   2.778225   1.200329     2.31   0.021     .4256235    5.130827
         17  |   9.851266   1.200397     8.21   0.000     7.498531      12.204
         18  |  -.2567198   1.200402    -0.21   0.831    -2.609465    2.096025
         19  |   5.652189   1.412999     4.00   0.000     2.882762    8.421616
         20  |  -.7424832    1.20022    -0.62   0.536    -3.094871    1.609904
         21  |   4.701329    1.20021     3.92   0.000      2.34896    7.053698
         22  |   27.15445   1.230053    22.08   0.000     24.74359    29.56531
         23  |   3.933447   1.200975     3.28   0.001     1.579579    6.287315
         24  |   4.588735    1.20022     3.82   0.000     2.236347    6.941122
         25  |   6.256495   1.200382     5.21   0.000      3.90379    8.609201
         26  |   15.58412    1.20126    12.97   0.000      13.2297    17.93855
         27  |    4.39211   1.200253     3.66   0.000     2.039657    6.744563
         28  |    10.4312   1.200673     8.69   0.000     8.077923    12.78447
         29  |   6.685062    1.20248     5.56   0.000     4.328245     9.04188
         30  |   1.322033   1.200204     1.10   0.271    -1.030324    3.674389
         31  |   5.019941   1.200375     4.18   0.000     2.667249    7.372633
             |
       _cons |   1.032435   .8493967     1.22   0.224    -.6323524    2.697222
------------------------------------------------------------------------------

.
. xi: reg env curra i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   76.09
       Model |   14872.958    31  479.772838           Prob > F      =  0.0000
    Residual |  1557.32667   247  6.30496626           R-squared     =  0.9052
-------------+------------------------------           Adj R-squared =  0.8933
       Total |  16430.2847   278  59.1017434           Root MSE      =   2.511

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0186757   .0026093     7.16   0.000     .0135364     .023815
```

```
    _Ifirm_2 |  -.7681673   1.913236    -0.40   0.688    -4.536505    3.000171
    _Ifirm_3 |   10.84744   1.185607     9.15   0.000     8.512248    13.18263
    _Ifirm_4 |   3.008046   1.188591     2.53   0.012     .6669787    5.349113
    _Ifirm_5 |   2.807944    1.22227     2.30   0.022     .4005425    5.215345
    _Ifirm_6 |    4.15794   1.513468     2.75   0.006     1.176992    7.138889
    _Ifirm_7 |   7.027051   1.272197     5.52   0.000     4.521314    9.532788
    _Ifirm_8 |  -.0644932   1.185321    -0.05   0.957    -2.399119    2.270132
    _Ifirm_9 |   2.090512   1.196881     1.75   0.082    -.2668824    4.447907
   _Ifirm_10 |   1.732808   1.242986     1.39   0.165    -.7153958    4.181012
   _Ifirm_11 |   2.080846   1.184432     1.76   0.080    -.2520287    4.413721
   _Ifirm_12 |   9.619705   2.832797     3.40   0.001     4.040187    15.19922
   _Ifirm_13 |   11.06269   1.771412     6.25   0.000     7.573695    14.55169
   _Ifirm_14 |   1.671985   1.198982     1.39   0.164    -.6895484    4.033518
   _Ifirm_15 |   .8735152   1.184711     0.74   0.462     -1.45991     3.20694
   _Ifirm_16 |   2.574006   1.183858     2.17   0.031     .2422607    4.905751
   _Ifirm_17 |   5.061588   1.354834     3.74   0.000     2.393087    7.730089
   _Ifirm_18 |  -.1953892   1.183831    -0.17   0.869     -2.52708    2.136301
   _Ifirm_19 |  -6.299055   2.338241    -2.69   0.008    -10.90449   -1.693622
   _Ifirm_20 |  -.8581814   1.183756    -0.72   0.469    -3.189724    1.473361
   _Ifirm_21 |  -.1456614   1.362718    -0.11   0.915     -2.82969    2.538367
   _Ifirm_22 |      14.67   2.212729     6.63   0.000     10.31178    19.02823
   _Ifirm_23 |    2.15674     1.2137     1.78   0.077    -.2337812    4.547261
   _Ifirm_24 |   4.121354   1.185322     3.48   0.001     1.786727    6.455982
   _Ifirm_25 |   4.666861   1.206155     3.87   0.000     2.291201    7.042522
   _Ifirm_26 |   11.41521   1.329738     8.58   0.000      8.79614    14.03428
   _Ifirm_27 |   2.729099   1.205295     2.26   0.024     .3551323    5.103065
   _Ifirm_28 |   6.270699   1.325671     4.73   0.000     3.659638    8.881761
   _Ifirm_29 |   4.203258   1.243532     3.38   0.001     1.753979    6.652537
   _Ifirm_30 |   .4574362   1.189907     0.38   0.701    -1.886222    2.801095
   _Ifirm_31 |   3.845377    1.19634     3.21   0.001     1.489048    6.201706
       _cons |   .1419371    .848739     0.17   0.867    -1.529752    1.813626
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
       curra |     20.30    0.049264
   _Ifirm_12 |     11.09    0.090209
   _Ifirm_19 |      7.55    0.132404
   _Ifirm_22 |      6.76    0.147851
    _Ifirm_2 |      5.06    0.197762
   _Ifirm_13 |      4.33    0.230697
    _Ifirm_6 |      3.16    0.316034
   _Ifirm_21 |      2.57    0.389824
   _Ifirm_17 |      2.54    0.394374
   _Ifirm_26 |      2.44    0.409401
   _Ifirm_28 |      2.43    0.411916
    _Ifirm_7 |      2.24    0.447273
   _Ifirm_29 |      2.14    0.468130
   _Ifirm_10 |      2.13    0.468542
    _Ifirm_5 |      2.06    0.484559
   _Ifirm_23 |      2.03    0.491426
   _Ifirm_25 |      2.01    0.497593
   _Ifirm_27 |      2.01    0.498304
   _Ifirm_14 |      1.99    0.503565
    _Ifirm_9 |      1.98    0.505334
   _Ifirm_31 |      1.98    0.505791
   _Ifirm_30 |      1.96    0.511275
    _Ifirm_4 |      1.95    0.512408
```

```
    _Ifirm_3 |      1.94    0.514991
   _Ifirm_24 |      1.94    0.515238
    _Ifirm_8 |      1.94    0.515239
   _Ifirm_15 |      1.94    0.515769
   _Ifirm_11 |      1.94    0.516013
   _Ifirm_16 |      1.94    0.516513
   _Ifirm_18 |      1.94    0.516537
   _Ifirm_20 |      1.94    0.516603
-------------+----------------------
    Mean VIF |      3.49

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   135.56
         Prob > chi2  =   0.0000

. xtgls env curra i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   2664.54
Log likelihood             = -635.7561          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       curra |   .0186757   .0024551     7.61   0.000     .0138638    .0234876
             |
        firm |
          2  |  -.7681673   1.800176    -0.43   0.670    -4.296447    2.760113
          3  |   10.84744   1.115545     9.72   0.000     8.661008    13.03386
          4  |   3.008046   1.118353     2.69   0.007      .816114    5.199978
          5  |   2.807944   1.150042     2.44   0.015     .5539036    5.061984
          6  |    4.15794   1.424031     2.92   0.004     1.366891     6.94899
          7  |   7.027051   1.197018     5.87   0.000     4.680939    9.373163
          8  |  -.0644932   1.115276    -0.06   0.954    -2.250394    2.121407
          9  |   2.090512   1.126153     1.86   0.063     -.116707    4.297732
         10  |   1.732808   1.169533     1.48   0.138    -.5594354    4.025052
         11  |   2.080846    1.11444     1.87   0.062    -.1034152    4.265108
         12  |   9.619705   2.665396     3.61   0.000     4.395624    14.84379
         13  |   11.06269   1.666733     6.64   0.000     7.795958    14.32943
         14  |   1.671985    1.12813     1.48   0.138    -.5391093    3.883079
         15  |   .8735152   1.114702     0.78   0.433    -1.311261    3.058292
         16  |   2.574006     1.1139     2.31   0.021     .3908021     4.75721
         17  |   5.061588   1.274772     3.97   0.000     2.563081    7.560095
         18  |  -.1953892   1.113874    -0.18   0.861    -2.378542    1.987763
         19  |  -6.299055   2.200065    -2.86   0.004     -10.6111   -1.987006
         20  |  -.8581814   1.113803    -0.77   0.441    -3.041196    1.324833
         21  |  -.1456614    1.28219    -0.11   0.910    -2.658707    2.367384
```

```
          22 |      14.67    2.08197     7.05   0.000     10.58942    18.75059
          23 |    2.15674   1.141978     1.89   0.059    -.0814955    4.394975
          24 |   4.121354   1.115277     3.70   0.000     1.935452    6.307257
          25 |   4.666861   1.134879     4.11   0.000      2.44254    6.891183
          26 |   11.41521   1.251159     9.12   0.000     8.962985    13.86744
          27 |   2.729099   1.134069     2.41   0.016     .5063634    4.951834
          28 |   6.270699   1.247332     5.03   0.000     3.825973    8.715426
          29 |   4.203258   1.170047     3.59   0.000     1.910008    6.496508
          30 |   .4574362   1.119591     0.41   0.683    -1.736922    2.651794
          31 |   3.845377   1.125644     3.42   0.001     1.639155    6.051598
             |
       _cons |   .1419371   .7985838     0.18   0.859    -1.423259    1.707133
------------------------------------------------------------------------------

.
. xi: reg env asset i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   72.74
       Model |   14808.243    31  477.685259           Prob > F      =  0.0000
    Residual |  1622.04163   247  6.56697014           R-squared     =  0.9013
-------------+------------------------------           Adj R-squared =  0.8889
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.5626

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0090037   .0014357     6.27   0.000     .0061759    .0118315
    _Ifirm_2 |   -1.10374   2.142121    -0.52   0.607    -5.322892    3.115412
    _Ifirm_3 |   10.55761    1.20842     8.74   0.000     8.177486    12.93773
    _Ifirm_4 |   2.418888    1.22738     1.97   0.050     .0014219    4.836355
    _Ifirm_5 |   1.680371   1.318192     1.27   0.204    -.9159596    4.276702
    _Ifirm_6 |   2.632554   1.789045     1.47   0.142    -.8911753    6.156284
    _Ifirm_7 |   7.225624   1.307584     5.53   0.000     4.650187    9.801062
    _Ifirm_8 |  -.1809104   1.209168    -0.15   0.881    -2.562506    2.200685
    _Ifirm_9 |   1.952472   1.228676     1.59   0.113    -.4675461    4.372489
   _Ifirm_10 |   .9152407   1.332912     0.69   0.493    -1.710083    3.540565
   _Ifirm_11 |   1.447626   1.217188     1.19   0.235    -.9497656    3.845017
   _Ifirm_12 |   8.444084   3.350105     2.52   0.012     1.845668     15.0425
   _Ifirm_13 |    9.49014   2.130432     4.45   0.000     5.294011    13.68627
   _Ifirm_14 |   1.552433   1.231049     1.26   0.208    -.8722594    3.977126
   _Ifirm_15 |   .3075044   1.216889     0.25   0.801    -2.089298    2.704307
   _Ifirm_16 |   2.294144   1.209935     1.90   0.059    -.0889614     4.67725
   _Ifirm_17 |   3.287874   1.590837     2.07   0.040      .154538     6.42121
   _Ifirm_18 |  -.3266374   1.208026    -0.27   0.787    -2.705983    2.052709
   _Ifirm_19 |  -5.018041   2.420187    -2.07   0.039    -9.784876   -.2512058
   _Ifirm_20 |  -.8468912   1.208099    -0.70   0.484     -3.22638    1.532598
   _Ifirm_21 |  -3.475627   1.775791    -1.96   0.051    -6.973253    .0219976
   _Ifirm_22 |   12.34455   2.780575     4.44   0.000     6.867892    17.82122
   _Ifirm_23 |   1.188988   1.292812     0.92   0.359    -1.357355     3.73533
   _Ifirm_24 |    3.70039   1.215912     3.04   0.003     1.305512    6.095268
   _Ifirm_25 |   3.864116   1.270187     3.04   0.003     1.362337    6.365896
   _Ifirm_26 |   10.65497   1.455965     7.32   0.000     7.787276    13.52266
   _Ifirm_27 |   2.530772    1.24257     2.04   0.043     .0833871    4.978157
   _Ifirm_28 |   4.689172   1.526635     3.07   0.002     1.682289    7.696054
   _Ifirm_29 |   3.909705    1.30056     3.01   0.003     1.348102    6.471307
   _Ifirm_30 |   .3222935   1.218612     0.26   0.792    -2.077903     2.72249
   _Ifirm_31 |   3.384925   1.238162     2.73   0.007     .9462222    5.823627
       _cons |   .4329846   .8618044     0.50   0.616    -1.264438    2.130407
```

```
------------------------------------------------------------------------------

. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
       asset |     28.06    0.035634
   _Ifirm_12 |     14.89    0.067181
   _Ifirm_22 |     10.25    0.097520
   _Ifirm_19 |      7.77    0.128726
    _Ifirm_2 |      6.09    0.164314
   _Ifirm_13 |      6.02    0.166122
    _Ifirm_6 |      4.25    0.235570
   _Ifirm_21 |      4.18    0.239100
   _Ifirm_17 |      3.36    0.297928
   _Ifirm_28 |      3.09    0.323514
   _Ifirm_26 |      2.81    0.355681
   _Ifirm_10 |      2.36    0.424385
    _Ifirm_5 |      2.30    0.433916
    _Ifirm_7 |      2.27    0.440985
   _Ifirm_29 |      2.24    0.445761
   _Ifirm_23 |      2.22    0.451120
   _Ifirm_25 |      2.14    0.467334
   _Ifirm_27 |      2.05    0.488338
   _Ifirm_31 |      2.03    0.491822
   _Ifirm_14 |      2.01    0.497522
    _Ifirm_9 |      2.00    0.499446
    _Ifirm_4 |      2.00    0.500501
   _Ifirm_30 |      1.97    0.507729
   _Ifirm_11 |      1.96    0.508918
   _Ifirm_15 |      1.96    0.509168
   _Ifirm_24 |      1.96    0.509987
   _Ifirm_16 |      1.94    0.515038
    _Ifirm_8 |      1.94    0.515691
    _Ifirm_3 |      1.94    0.516330
   _Ifirm_20 |      1.94    0.516604
   _Ifirm_18 |      1.94    0.516667
-------------+----------------------
    Mean VIF |      4.26

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   131.21
         Prob > chi2  =   0.0000

. xtgls env asset i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
```

```
                                                  Wald chi2(31)      =   2547.10
Log likelihood             = -641.4358            Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       asset |   .0090037   .0013509     6.67   0.000     .0063561    .0116513
             |
        firm |
          2  |   -1.10374   2.015535    -0.55   0.584    -5.054116    2.846635
          3  |   10.55761    1.13701     9.29   0.000     8.329109    12.78611
          4  |   2.418888    1.15485     2.09   0.036     .1554241    4.682353
          5  |   1.680371   1.240295     1.35   0.175     -.750563    4.111305
          6  |   2.632554   1.683324     1.56   0.118    -.6666997    5.931808
          7  |   7.225624   1.230314     5.87   0.000     4.814252    9.636997
          8  |  -.1809104   1.137714    -0.16   0.874    -2.410789    2.048968
          9  |   1.952472   1.156069     1.69   0.091    -.3133813    4.218324
         10  |   .9152407   1.254146     0.73   0.466     -1.54284    3.373321
         11  |   1.447626    1.14526     1.26   0.206    -.7970423    3.692293
         12  |   8.444084   3.152135     2.68   0.007     2.266014    14.62216
         13  |    9.49014   2.004537     4.73   0.000     5.561321    13.41896
         14  |   1.552433   1.158302     1.34   0.180    -.7177969    3.822663
         15  |   .3075044   1.144978     0.27   0.788    -1.936612    2.551621
         16  |   2.294144   1.138435     2.02   0.044     .0628519    4.525437
         17  |   3.287874   1.496828     2.20   0.028      .354144    6.221604
         18  |  -.3266374   1.136639    -0.29   0.774    -2.554409    1.901135
         19  |  -5.018041   2.277169    -2.20   0.028     -9.48121   -.5548722
         20  |  -.8468912   1.136708    -0.75   0.456    -3.074797    1.381015
         21  |  -3.475627   1.670853    -2.08   0.038     -6.75044   -.2008151
         22  |   12.34455   2.616261     4.72   0.000     7.216777    17.47233
         23  |   1.188988   1.216415     0.98   0.328    -1.195143    3.573118
         24  |    3.70039   1.144059     3.23   0.001     1.458075    5.942704
         25  |   3.864116   1.195127     3.23   0.001      1.52171    6.206523
         26  |   10.65497   1.369927     7.78   0.000     7.969959    13.33997
         27  |   2.530772   1.169142     2.16   0.030     .2392952    4.822249
         28  |   4.689172    1.43642     3.26   0.001      1.87384    7.504504
         29  |   3.909705   1.223705     3.19   0.001     1.511287    6.308123
         30  |   .3222935     1.1466     0.28   0.779    -1.925001    2.569588
         31  |   3.384925   1.164995     2.91   0.004     1.101577    5.668272
             |
       _cons |   .4329846   .8108772     0.53   0.593    -1.156306    2.022275
------------------------------------------------------------------------------

.
. xi: reg env currl i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   64.35
       Model |  14620.0372    31  471.614103           Prob > F      =  0.0000
    Residual |  1810.24748   247  7.32893717           R-squared     =  0.8898
-------------+------------------------------           Adj R-squared =  0.8760
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.7072

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0138793   .0044887     3.09   0.002     .0050383    .0227203
    _Ifirm_2 |   4.274884   2.246162     1.90   0.058    -.1491901    8.698958
    _Ifirm_3 |   10.53977   1.277451     8.25   0.000     8.023688    13.05586
```

_Ifirm_4	2.996204	1.301146	2.30	0.022	.4334472	5.558961
_Ifirm_5	3.489495	1.365198	2.56	0.011	.8005809	6.178409
_Ifirm_6	5.210868	2.241378	2.32	0.021	.7962169	9.62552
_Ifirm_7	8.495007	1.412112	6.02	0.000	5.713691	11.27632
_Ifirm_8	-.4620258	1.276283	-0.36	0.718	-2.975811	2.05176
_Ifirm_9	2.723305	1.292652	2.11	0.036	.1772786	5.269332
_Ifirm_10	3.512093	1.31159	2.68	0.008	.9287653	6.095421
_Ifirm_11	1.837548	1.288297	1.43	0.155	-.6998999	4.374996
_Ifirm_12	14.86234	4.448843	3.34	0.001	6.099829	23.62484
_Ifirm_13	14.03344	2.448665	5.73	0.000	9.210516	18.85637
_Ifirm_14	2.044282	1.316075	1.55	0.122	-.5478788	4.636442
_Ifirm_15	.7206447	1.286646	0.56	0.576	-1.813553	3.254842
_Ifirm_16	2.654697	1.276363	2.08	0.039	.1407537	5.168639
_Ifirm_17	5.786158	1.815616	3.19	0.002	2.210094	9.362221
_Ifirm_18	-.3885811	1.27633	-0.30	0.761	-2.902459	2.125296
_Ifirm_19	3.829804	1.888434	2.03	0.044	.1103175	7.549291
_Ifirm_20	-.8801405	1.276742	-0.69	0.491	-3.39483	1.634549
_Ifirm_21	-.5725965	2.12652	-0.27	0.788	-4.761023	3.61583
_Ifirm_22	20.0073	2.897526	6.90	0.000	14.30029	25.71431
_Ifirm_23	2.618551	1.360539	1.92	0.055	-.0611853	5.298288
_Ifirm_24	4.21269	1.281334	3.29	0.001	1.688956	6.736423
_Ifirm_25	5.209338	1.326262	3.93	0.000	2.597112	7.821564
_Ifirm_26	11.94006	1.774352	6.73	0.000	8.445271	15.43485
_Ifirm_27	3.374209	1.315051	2.57	0.011	.7840658	5.964353
_Ifirm_28	6.305357	1.872678	3.37	0.001	2.616904	9.993811
_Ifirm_29	5.560853	1.350952	4.12	0.000	2.899998	8.221709
_Ifirm_30	1.105788	1.278199	0.87	0.388	-1.411771	3.623346
_Ifirm_31	4.350992	1.298235	3.35	0.001	1.793969	6.908016
_cons	.8179975	.9087362	0.90	0.369	-.9718626	2.607858

. vif

Variable	VIF	1/VIF
currl	36.43	0.027446
_Ifirm_12	23.52	0.042515
_Ifirm_22	9.98	0.100227
_Ifirm_13	7.13	0.140340
_Ifirm_2	6.00	0.166785
_Ifirm_6	5.97	0.167498
_Ifirm_21	5.37	0.186080
_Ifirm_19	4.24	0.235958
_Ifirm_28	4.17	0.239946
_Ifirm_17	3.92	0.255265
_Ifirm_26	3.74	0.267276
_Ifirm_7	2.37	0.421989
_Ifirm_5	2.21	0.451489
_Ifirm_23	2.20	0.454587
_Ifirm_29	2.17	0.461062
_Ifirm_25	2.09	0.478388
_Ifirm_14	2.06	0.485823
_Ifirm_27	2.06	0.486580
_Ifirm_10	2.04	0.489150
_Ifirm_4	2.01	0.497035
_Ifirm_31	2.00	0.499266
_Ifirm_9	1.99	0.503588
_Ifirm_11	1.97	0.506999
_Ifirm_15	1.97	0.508301
_Ifirm_24	1.95	0.512524

```
   _Ifirm_30 |      1.94    0.515042
    _Ifirm_3 |      1.94    0.515645
   _Ifirm_20 |      1.94    0.516218
   _Ifirm_16 |      1.94    0.516524
   _Ifirm_18 |      1.94    0.516551
    _Ifirm_8 |      1.94    0.516589
-------------+----------------------
    Mean VIF |      4.88

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   148.11
         Prob > chi2  =   0.0000

. xtgls env currl i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   2253.28
Log likelihood             = -656.7498          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       currl |   .0138793   .0042235     3.29   0.001     .0056015    .0221571
             |
        firm |
          2  |   4.274884   2.113428     2.02   0.043      .132641    8.417127
          3  |   10.53977   1.201961     8.77   0.000     8.183972    12.89557
          4  |   2.996204   1.224257     2.45   0.014     .5967051    5.395703
          5  |   3.489495   1.284523     2.72   0.007     .9718754    6.007114
          6  |   5.210868   2.108927     2.47   0.013     1.077448    9.344289
          7  |   8.495007   1.328665     6.39   0.000     5.890872    11.09914
          8  |  -.4620258   1.200863    -0.38   0.700    -2.815673    1.891622
          9  |   2.723305   1.216265     2.24   0.025     .3394706     5.10714
         10  |   3.512093   1.234084     2.85   0.004     1.093334    5.930853
         11  |   1.837548   1.212166     1.52   0.130    -.5382544     4.21335
         12  |   14.86234   4.185944     3.55   0.000     6.658036    23.06663
         13  |   14.03344   2.303964     6.09   0.000     9.517755    18.54913
         14  |   2.044282   1.238303     1.65   0.099    -.3827479    4.471311
         15  |   .7206447   1.210614     0.60   0.552    -1.652114    3.093404
         16  |   2.654697   1.200938     2.21   0.027     .3009018    5.008491
         17  |   5.786158   1.708324     3.39   0.001     2.437904    9.134412
         18  |  -.3885811   1.200907    -0.32   0.746    -2.742315    1.965152
         19  |   3.829804   1.776839     2.16   0.031     .3472636    7.312345
         20  |  -.8801405   1.201294    -0.73   0.464    -3.234634    1.474353
         21  |  -.5725965   2.000856    -0.29   0.775    -4.494203     3.34901
         22  |    20.0073   2.726301     7.34   0.000     14.66385    25.35075
         23  |   2.618551   1.280139     2.05   0.041     .1095246    5.127578
```

```
          24 |    4.21269   1.205615     3.49   0.000     1.849728    6.575652
          25 |   5.209338   1.247888     4.17   0.000     2.763522    7.655154
          26 |   11.94006   1.669499     7.15   0.000     8.667903    15.21222
          27 |   3.374209    1.23734     2.73   0.006     .9490682     5.79935
          28 |   6.305357   1.762014     3.58   0.000     2.851873    9.758842
          29 |   5.560853   1.271119     4.37   0.000     3.069505    8.052202
          30 |   1.105788   1.202665     0.92   0.358    -1.251393    3.462968
          31 |   4.350992   1.221518     3.56   0.000     1.956861    6.745123
             |
       _cons |   .8179975   .8550356     0.96   0.339    -.8578414    2.493836
------------------------------------------------------------------------------

.
. xi: reg env ltd i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   61.72
       Model |  14551.6638    31  469.40851            Prob > F      =  0.0000
    Residual |  1878.62086   247  7.60575246           R-squared     =  0.8857
-------------+------------------------------           Adj R-squared =  0.8713
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.7579

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |  -.0027651   .0058546    -0.47   0.637    -.0142965    .0087662
    _Ifirm_2 |   10.47843   1.660924     6.31   0.000      7.20705    13.74981
    _Ifirm_3 |   10.36452   1.300065     7.97   0.000     7.803894    12.92515
    _Ifirm_4 |   3.847016   1.307683     2.94   0.004     1.271384    6.422648
    _Ifirm_5 |   5.219704   1.388968     3.76   0.000     2.483973    7.955435
    _Ifirm_6 |    11.7764   2.251477     5.23   0.000      7.34186    16.21094
    _Ifirm_7 |   10.43318   1.308264     7.97   0.000     7.856407    13.00996
    _Ifirm_8 |  -.5026133    1.30017    -0.39   0.699    -3.063447    2.058221
    _Ifirm_9 |   3.373723   1.300427     2.59   0.010     .8123836    5.935063
   _Ifirm_10 |   4.518628   1.308636     3.45   0.001     1.941118    7.096137
   _Ifirm_11 |   2.424707    1.30314     1.86   0.064    -.1419771    4.991391
   _Ifirm_12 |   29.30974   2.985846     9.82   0.000     23.42877    35.19071
   _Ifirm_13 |   21.28144   2.112165    10.08   0.000     17.12128    25.44159
   _Ifirm_14 |   3.092325    1.30504     2.37   0.019     .5219001    5.662751
   _Ifirm_15 |   1.289317   1.306766     0.99   0.325     -1.28451    3.863143
   _Ifirm_16 |   2.738074   1.300614     2.11   0.036     .1763658    5.299781
   _Ifirm_17 |   10.00271    1.38342     7.23   0.000     7.277904    12.72751
   _Ifirm_18 |  -.3203747    1.30021    -0.25   0.806    -2.881287    2.240537
   _Ifirm_19 |   8.300939   1.347381     6.16   0.000     5.647118    10.95476
   _Ifirm_20 |  -.7598972    1.30009    -0.58   0.559    -3.320574    1.800779
   _Ifirm_21 |   5.409758    2.00798     2.69   0.008     1.454812    9.364705
   _Ifirm_22 |   29.00325   2.399396    12.09   0.000     24.27736    33.72913
   _Ifirm_23 |   4.322708   1.400466     3.09   0.002     1.564329    7.081087
   _Ifirm_24 |   4.615165   1.303985     3.54   0.000     2.046817    7.183512
   _Ifirm_25 |   6.521992   1.364974     4.78   0.000      3.83352    9.210464
   _Ifirm_26 |   16.18786   1.594577    10.15   0.000     13.04715    19.32856
   _Ifirm_27 |   4.479925   1.326512     3.38   0.001     1.867208    7.092642
   _Ifirm_28 |   11.13747   1.809545     6.15   0.000     7.573369    14.70158
   _Ifirm_29 |   7.036956   1.319199     5.33   0.000     4.438643     9.63527
   _Ifirm_30 |   1.356409    1.30151     1.04   0.298    -1.207064    3.919882
   _Ifirm_31 |   5.182122   1.315357     3.94   0.000     2.591376    7.772869
       _cons |   1.149553   .9192846     1.25   0.212    -.6610836    2.960189
------------------------------------------------------------------------------
```

```
. vif

    Variable |       VIF       1/VIF  
-------------+----------------------
         ltd |     19.15    0.052209
   _Ifirm_12 |     10.21    0.097950
   _Ifirm_22 |      6.59    0.151683
    _Ifirm_6 |      5.80    0.172268
   _Ifirm_13 |      5.11    0.195742
   _Ifirm_21 |      4.62    0.216582
   _Ifirm_28 |      3.75    0.266687
    _Ifirm_2 |      3.16    0.316549
   _Ifirm_26 |      2.91    0.343438
   _Ifirm_23 |      2.25    0.445241
    _Ifirm_5 |      2.21    0.452643
   _Ifirm_17 |      2.19    0.456281
   _Ifirm_25 |      2.13    0.468696
   _Ifirm_19 |      2.08    0.481016
   _Ifirm_27 |      2.02    0.496270
   _Ifirm_29 |      1.99    0.501787
   _Ifirm_31 |      1.98    0.504723
   _Ifirm_10 |      1.96    0.509920
    _Ifirm_7 |      1.96    0.510210
    _Ifirm_4 |      1.96    0.510664
   _Ifirm_15 |      1.96    0.511381
   _Ifirm_14 |      1.95    0.512735
   _Ifirm_24 |      1.95    0.513565
   _Ifirm_11 |      1.94    0.514230
   _Ifirm_30 |      1.94    0.515520
   _Ifirm_16 |      1.94    0.516230
    _Ifirm_9 |      1.94    0.516379
   _Ifirm_18 |      1.94    0.516551
    _Ifirm_8 |      1.94    0.516583
   _Ifirm_20 |      1.94    0.516646
    _Ifirm_3 |      1.94    0.516666
-------------+----------------------
    Mean VIF |      3.40

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   186.32
         Prob > chi2  =   0.0000

. xtgls env ltd i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   2161.11
Log likelihood             = -661.9217          Prob > chi2        =    0.0000
```

```
------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ltd |  -.0027651   .0055087    -0.50   0.616    -.0135619    .0080316
             |
        firm |
          2  |   10.47843   1.562774     6.71   0.000      7.41545    13.54141
          3  |   10.36452   1.223239     8.47   0.000     7.967016    12.76202
          4  |   3.847016   1.230407     3.13   0.002     1.435462     6.25857
          5  |   5.219704   1.306888     3.99   0.000      2.65825    7.781158
          6  |    11.7764   2.118429     5.56   0.000     7.624358    15.92845
          7  |   10.43318   1.230954     8.48   0.000     8.020558    12.84581
          8  |  -.5026133   1.223338    -0.41   0.681    -2.900312    1.895085
          9  |   3.373723    1.22358     2.76   0.006     .9755512    5.771896
         10  |   4.518628   1.231304     3.67   0.000     2.105315     6.93194
         11  |   2.424707   1.226133     1.98   0.048     .0215309    4.827883
         12  |   29.30974   2.809402    10.43   0.000     23.80341    34.81607
         13  |   21.28144   1.987349    10.71   0.000      17.3863    25.17657
         14  |   3.092325    1.22792     2.52   0.012     .6856464    5.499004
         15  |   1.289317   1.229545     1.05   0.294    -1.120547     3.69918
         16  |   2.738074   1.223756     2.24   0.025     .3395568     5.13659
         17  |   10.00271   1.301668     7.68   0.000     7.451485    12.55393
         18  |  -.3203747   1.223375    -0.26   0.793    -2.718146    2.077397
         19  |   8.300939   1.267759     6.55   0.000     5.816177     10.7857
         20  |  -.7598972   1.223263    -0.62   0.534    -3.157448    1.637654
         21  |   5.409758   1.889321     2.86   0.004     1.706758    9.112759
         22  |   29.00325   2.257607    12.85   0.000     24.57842    33.42807
         23  |   4.322708   1.317708     3.28   0.001     1.740049    6.905368
         24  |   4.615165   1.226927     3.76   0.000     2.210431    7.019898
         25  |   6.521992   1.284312     5.08   0.000     4.004786    9.039197
         26  |   16.18786   1.500348    10.79   0.000     13.24723    19.12849
         27  |   4.479925   1.248123     3.59   0.000     2.033649    6.926202
         28  |   11.13747   1.702612     6.54   0.000     7.800416    14.47453
         29  |   7.036956   1.241242     5.67   0.000     4.604166    9.469747
         30  |   1.356409   1.224599     1.11   0.268    -1.043761    3.756579
         31  |   5.182122   1.237628     4.19   0.000     2.756417    7.607828
             |
       _cons |   1.149553   .8649606     1.33   0.184    -.5457389    2.844845
------------------------------------------------------------------------------

.
. xi: reg env liab i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   62.75
       Model |  14579.1178    31  470.294121           Prob > F      =  0.0000
    Residual |   1851.1669   247  7.49460283           R-squared     =  0.8873
-------------+------------------------------           Adj R-squared =  0.8732
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.7376

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0057242   .0029025     1.97   0.050     7.48e-06    .0114409
    _Ifirm_2 |   5.788474   2.490881     2.32   0.021      .882399    10.69455
    _Ifirm_3 |   10.42734   1.290928     8.08   0.000     7.884709    12.96997
    _Ifirm_4 |   3.191741   1.324602     2.41   0.017     .5827853    5.800697
    _Ifirm_5 |   3.755048   1.434154     2.62   0.009     .9303178    6.579778
```

_Ifirm_6	6.35621	2.644388	2.40	0.017	1.147784	11.56464
_Ifirm_7	9.274575	1.403805	6.61	0.000	6.509621	12.03953
_Ifirm_8	-.5226898	1.290545	-0.41	0.686	-3.064566	2.019186
_Ifirm_9	2.960974	1.306233	2.27	0.024	.3881992	5.533749
_Ifirm_10	3.705326	1.344349	2.76	0.006	1.057476	6.353176
_Ifirm_11	2.024793	1.303209	1.55	0.122	-.5420269	4.591613
_Ifirm_12	19.15775	4.685108	4.09	0.000	9.929887	28.3856
_Ifirm_13	15.83293	2.693332	5.88	0.000	10.52811	21.13776
_Ifirm_14	2.433963	1.326441	1.83	0.068	-.1786152	5.04654
_Ifirm_15	.8057607	1.308076	0.62	0.538	-1.770646	3.382167
_Ifirm_16	2.615013	1.291632	2.02	0.044	.0709954	5.15903
_Ifirm_17	7.250476	1.819245	3.99	0.000	3.667264	10.83369
_Ifirm_18	-.3950728	1.290957	-0.31	0.760	-2.937761	2.147616
_Ifirm_19	5.731993	1.77442	3.23	0.001	2.237069	9.226917
_Ifirm_20	-.8223827	1.290872	-0.64	0.525	-3.364904	1.720138
_Ifirm_21	.5655617	2.456142	0.23	0.818	-4.272091	5.403215
_Ifirm_22	21.97901	3.338233	6.58	0.000	15.40398	28.55405
_Ifirm_23	2.798432	1.444165	1.94	0.054	-.0460168	5.64288
_Ifirm_24	4.287315	1.298323	3.30	0.001	1.730118	6.844511
_Ifirm_25	5.337758	1.384316	3.86	0.000	2.611189	8.064328
_Ifirm_26	13.11279	1.859028	7.05	0.000	9.451217	16.77435
_Ifirm_27	3.669871	1.336528	2.75	0.006	1.037426	6.302316
_Ifirm_28	7.368438	2.063124	3.57	0.000	3.304879	11.432
_Ifirm_29	6.005406	1.373258	4.37	0.000	3.300617	8.710195
_Ifirm_30	1.034252	1.299064	0.80	0.427	-1.524404	3.592908
_Ifirm_31	4.535069	1.320597	3.43	0.001	1.934002	7.136136
_cons	1.005145	.915462	1.10	0.273	-.7979624	2.808252

. vif

Variable	VIF	1/VIF
liab	43.41	0.023034
_Ifirm_12	25.51	0.039202
_Ifirm_22	12.95	0.077217
_Ifirm_13	8.43	0.118622
_Ifirm_6	8.13	0.123054
_Ifirm_2	7.21	0.138689
_Ifirm_21	7.01	0.142639
_Ifirm_28	4.95	0.202160
_Ifirm_26	4.02	0.248986
_Ifirm_17	3.85	0.259995
_Ifirm_19	3.66	0.273296
_Ifirm_23	2.42	0.412585
_Ifirm_5	2.39	0.418365
_Ifirm_7	2.29	0.436650
_Ifirm_25	2.23	0.449031
_Ifirm_29	2.19	0.456292
_Ifirm_10	2.10	0.476127
_Ifirm_27	2.08	0.481715
_Ifirm_14	2.04	0.489070
_Ifirm_4	2.04	0.490428
_Ifirm_31	2.03	0.493408
_Ifirm_15	1.99	0.502899
_Ifirm_9	1.98	0.504319
_Ifirm_11	1.97	0.506662
_Ifirm_30	1.96	0.509900
_Ifirm_24	1.96	0.510483
_Ifirm_16	1.94	0.515785

```
   _Ifirm_18 |      1.94    0.516325
    _Ifirm_3 |      1.94    0.516348
   _Ifirm_20 |      1.94    0.516393
    _Ifirm_8 |      1.94    0.516655
-------------+----------------------
    Mean VIF |      5.50

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   154.59
         Prob > chi2  =   0.0000

. xtgls env liab i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   2197.30
Log likelihood             =  -659.868          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        liab |   .0057242   .0027309     2.10   0.036     .0003717    .0110767
             |
        firm |
          2  |   5.788474   2.343685     2.47   0.014     1.194936    10.38201
          3  |   10.42734   1.214642     8.58   0.000     8.046685    12.80799
          4  |   3.191741   1.246326     2.56   0.010     .7489862    5.634496
          5  |   3.755048   1.349404     2.78   0.005     1.110264    6.399831
          6  |    6.35621   2.488121     2.55   0.011     1.479581    11.23284
          7  |   9.274575   1.320849     7.02   0.000      6.68576    11.86339
          8  |  -.5226898   1.214282    -0.43   0.667    -2.902638    1.857259
          9  |   2.960974   1.229043     2.41   0.016     .5520952    5.369853
         10  |   3.705326   1.264907     2.93   0.003     1.226155    6.184497
         11  |   2.024793   1.226198     1.65   0.099    -.3785102    4.428096
         12  |   19.15775   4.408248     4.35   0.000     10.51774    27.79775
         13  |   15.83293   2.534173     6.25   0.000     10.86604    20.79982
         14  |   2.433963   1.248057     1.95   0.051    -.0121836    4.880109
         15  |   .8057607   1.230777     0.65   0.513    -1.606518     3.21804
         16  |   2.615013   1.215305     2.15   0.031     .2330595    4.996966
         17  |   7.250476   1.711739     4.24   0.000     3.895529    10.60542
         18  |  -.3950728    1.21467    -0.33   0.745    -2.775782    1.985637
         19  |   5.731993   1.669563     3.43   0.001     2.459709    9.004276
         20  |  -.8223827    1.21459    -0.68   0.498    -3.202935    1.558169
         21  |   .5655617   2.310999     0.24   0.807    -3.963914    5.095037
         22  |   21.97901   3.140964     7.00   0.000     15.82284    28.13519
         23  |   2.798432   1.358824     2.06   0.039     .1351859    5.461677
         24  |   4.287315     1.2216     3.51   0.000     1.893022    6.681607
         25  |   5.337758   1.302512     4.10   0.000     2.784883    7.890634
```

```
          26 |   13.11279   1.749171     7.50   0.000     9.684474     16.5411
          27 |   3.669871   1.257548     2.92   0.004     1.205123    6.134619
          28 |   7.368438   1.941206     3.80   0.000     3.563744    11.17313
          29 |   6.005406   1.292107     4.65   0.000     3.472923    8.537889
          30 |   1.034252   1.222298     0.85   0.397    -1.361408    3.429912
          31 |   4.535069   1.242558     3.65   0.000       2.0997    6.970438
             |
       _cons |   1.005145   .8613639     1.17   0.243    -.6830973    2.693387
------------------------------------------------------------------------------

.
. xi: reg env oe i.firm
i.firm            _Ifirm_1-31         (naturally coded; _Ifirm_1 omitted)

      Source |       SS       df       MS              Number of obs =     279
-------------+------------------------------           F( 31,   247) =   76.93
       Model |  14888.3047    31  480.267893           Prob > F      =  0.0000
    Residual |  1541.97998   247  6.24283394           R-squared     =  0.9062
-------------+------------------------------           Adj R-squared =  0.8944
       Total |  16430.2847   278  59.1017434           Root MSE      =  2.4986

------------------------------------------------------------------------------
         env |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          oe |   .0143406    .001948     7.36   0.000     .0105039    .0181774
    _Ifirm_2 |   2.846872    1.52605     1.87   0.063    -.1588597    5.852603
    _Ifirm_3 |    10.5139   1.178011     8.93   0.000     8.193669    12.83413
    _Ifirm_4 |   3.086692   1.181599     2.61   0.010     .7593962    5.413987
    _Ifirm_5 |   2.810153   1.214444     2.31   0.021     .4181658     5.20214
    _Ifirm_6 |   9.131198   1.202316     7.59   0.000       6.7631     11.4993
    _Ifirm_7 |   8.094881   1.217502     6.65   0.000     5.696871    10.49289
    _Ifirm_8 |   .0450966    1.18025     0.04   0.970    -2.279542    2.369735
    _Ifirm_9 |   2.116345   1.189874     1.78   0.077    -.2272477    4.459938
   _Ifirm_10 |   .6818133    1.28414     0.53   0.596    -1.847448    3.211074
   _Ifirm_11 |   1.789529   1.180586     1.52   0.131    -.5357709    4.114828
   _Ifirm_12 |   19.08155   1.693569    11.27   0.000     15.74587    22.41722
   _Ifirm_13 |   14.64721   1.420677    10.31   0.000     11.84903     17.4454
   _Ifirm_14 |   2.186208   1.183512     1.85   0.066    -.1448551    4.517272
   _Ifirm_15 |   .8175822   1.179147     0.69   0.489    -1.504883    3.140048
   _Ifirm_16 |   2.305167   1.179184     1.95   0.052    -.0173718    4.627705
   _Ifirm_17 |   5.775558   1.297335     4.45   0.000     3.220308    8.330808
   _Ifirm_18 |  -.1607697   1.178059    -0.14   0.892    -2.481091    2.159552
   _Ifirm_19 |  -6.796596     2.3453    -2.90   0.004    -11.41593   -2.177258
   _Ifirm_20 |  -.7492916   1.177837    -0.64   0.525    -3.069177    1.570594
   _Ifirm_21 |   2.011318   1.232638     1.63   0.104    -.4165032     4.43914
   _Ifirm_22 |   18.24616   1.777934    10.26   0.000     14.74432    21.74801
   _Ifirm_23 |   2.679863   1.193022     2.25   0.026     .3300689    5.029657
   _Ifirm_24 |   3.888247   1.181443     3.29   0.001     1.561259    6.215236
   _Ifirm_25 |   4.879806   1.194095     4.09   0.000     2.527899    7.231714
   _Ifirm_26 |   14.24524   1.195481    11.92   0.000      11.8906    16.59987
   _Ifirm_27 |   3.166751   1.188852     2.66   0.008     .8251711    5.508331
   _Ifirm_28 |   9.172467   1.192458     7.69   0.000     6.823785    11.52115
   _Ifirm_29 |   4.438133   1.225554     3.62   0.000     2.024265    6.852002
   _Ifirm_30 |   .4610211   1.183701     0.39   0.697    -1.870414    2.792456
   _Ifirm_31 |   3.760038   1.191562     3.16   0.002     1.413121    6.106955
       _cons |   .3693907   .8395649     0.44   0.660    -1.284229     2.02301
------------------------------------------------------------------------------

. vif
```

```
    Variable |       VIF       1/VIF  
-------------+----------------------
          oe |     10.48    0.095392
   _Ifirm_19 |      7.67    0.130312
   _Ifirm_22 |      4.41    0.226751
   _Ifirm_12 |      4.00    0.249905
    _Ifirm_2 |      3.25    0.307781
   _Ifirm_13 |      2.82    0.355131
   _Ifirm_17 |      2.35    0.425868
   _Ifirm_10 |      2.30    0.434665
   _Ifirm_21 |      2.12    0.471747
   _Ifirm_29 |      2.10    0.477216
    _Ifirm_7 |      2.07    0.483549
    _Ifirm_5 |      2.06    0.485987
    _Ifirm_6 |      2.02    0.495841
   _Ifirm_26 |      1.99    0.501527
   _Ifirm_25 |      1.99    0.502692
   _Ifirm_23 |      1.99    0.503596
   _Ifirm_28 |      1.98    0.504073
   _Ifirm_31 |      1.98    0.504832
    _Ifirm_9 |      1.98    0.506265
   _Ifirm_27 |      1.97    0.507136
   _Ifirm_30 |      1.95    0.511559
   _Ifirm_14 |      1.95    0.511722
    _Ifirm_4 |      1.95    0.513380
   _Ifirm_24 |      1.95    0.513516
   _Ifirm_11 |      1.94    0.514262
    _Ifirm_8 |      1.94    0.514554
   _Ifirm_16 |      1.94    0.515486
   _Ifirm_15 |      1.94    0.515518
   _Ifirm_18 |      1.94    0.516471
    _Ifirm_3 |      1.94    0.516513
   _Ifirm_20 |      1.94    0.516665
-------------+----------------------
    Mean VIF |      2.67

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity 
         Ho: Constant variance
         Variables: fitted values of env

         chi2(1)      =   135.79
         Prob > chi2  =   0.0000

. xtgls env oe i. firm

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       279
Estimated autocorrelations =         0          Number of groups   =        31
Estimated coefficients     =        32          Time periods       =         9
                                                Wald chi2(31)      =   2693.83
Log likelihood             = -634.3746          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
```

```
         env |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          oe |   .0143406   .0018329     7.82   0.000     .0107483     .017933
             |
        firm |
          2  |   2.846872    1.43587     1.98   0.047     .0326174    5.661126
          3  |    10.5139   1.108398     9.49   0.000     8.341477    12.68632
          4  |   3.086692   1.111774     2.78   0.005     .9076541    5.265729
          5  |   2.810153   1.142678     2.46   0.014     .5705449    5.049761
          6  |   9.131198   1.131266     8.07   0.000     6.913957    11.34844
          7  |   8.094881   1.145555     7.07   0.000     5.849634    10.34013
          8  |   .0450966   1.110505     0.04   0.968    -2.131453    2.221647
          9  |   2.116345    1.11956     1.89   0.059    -.0779516    4.310641
         10  |   .6818133   1.208255     0.56   0.573    -1.686324     3.04995
         11  |   1.789529   1.110821     1.61   0.107    -.3876401    3.966697
         12  |   19.08155   1.593489    11.97   0.000     15.95837    22.20473
         13  |   14.64721   1.336724    10.96   0.000     12.02728    17.26714
         14  |   2.186208   1.113574     1.96   0.050      .003643    4.368774
         15  |   .8175822   1.109467     0.74   0.461    -1.356933    2.992097
         16  |   2.305167   1.109502     2.08   0.038     .1305831     4.47975
         17  |   5.775558   1.220671     4.73   0.000     3.383087    8.168028
         18  |  -.1607697   1.108443    -0.15   0.885    -2.333278    2.011738
         19  |  -6.796596   2.206708    -3.08   0.002    -11.12166   -2.471528
         20  |  -.7492916   1.108234    -0.68   0.499    -2.921391    1.422808
         21  |   2.011318   1.159797     1.73   0.083    -.2618413    4.284478
         22  |   18.24616   1.672869    10.91   0.000      14.9674    21.52493
         23  |   2.679863   1.122522     2.39   0.017     .4797602    4.879966
         24  |   3.888247   1.111627     3.50   0.000     1.709498    6.066997
         25  |   4.879806   1.123532     4.34   0.000     2.677724    7.081888
         26  |   14.24524   1.124836    12.66   0.000      12.0406    16.44987
         27  |   3.166751   1.118598     2.83   0.005      .974339    5.359163
         28  |   9.172467   1.121991     8.18   0.000     6.973406    11.37153
         29  |   4.438133   1.153131     3.85   0.000     2.178038    6.698229
         30  |   .4610211   1.113752     0.41   0.679    -1.721892    2.643934
         31  |   3.760038   1.121148     3.35   0.001     1.562629    5.957447
             |
       _cons |   .3693907   .7899519     0.47   0.640    -1.178887    1.917668
------------------------------------------------------------------------------

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/REVISED Environment as Independent 2001-2009.log
  log type:  text
 closed on:   8 Jul 2012, 21:09:04
```

Appendix N: Granger Causality Test for all Thirty-One Firms Sampled

Firm Reference			
Firm 1	Aica	Firm 17	Sekisui Chemical
Firm 2	Asahi Kasei	Firm 18	Sekisui Jushi
Firm 3	Asahi Organic Chemicals	Firm 19	Shin-Etsu Chemical
Firm 4	Central Glass	Firm 20	Shin-Etsu Polymer
Firm 5	Daicel	Firm 21	Showa Denko KK
Firm 6	Dic Corportation	Firm 22	Sumitomo Chemical
Firm 7	Hitachi Chemical	Firm 23	Taiyo Nippon Sanso
Firm 8	Hokko Chemical Industry	Firm 24	Toagosei
Firm 9	Kansai Paint	Firm 25	Tokuyama Corp
Firm 10	Kuraray Co	Firm 26	Tosoh Corp
Firm 11	Kureha	Firm 27	Toyo Ink SC Holdings
Firm 12	Mitsubishi Chemical	Firm 28	Ube Industries
Firm 13	Mitsui Chemical	Firm 29	Kaneka Corp
Firm 14	Nippon Paint	Firm 30	Nippon Kayaku
Firm 15	NOF Corp	Firm 31	Nippon Shokubai
Firm 16	Sanyo Chemical		

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 1.log
  log type:  text
 opened on:   2 Jul 2012, 16:37:56

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =   .457624                         AIC             =  2.385594
FPE            =  .0574129                         HQIC            =  1.715842
Det(Sigma_ml)  =  .0030575                         SBIC            =  2.484896

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5        .066   0.7299   21.61511   0.0002
revtot               5     3.51342   0.9085   79.39401   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .414891   .5087022     0.82   0.415     -.582147    1.411929
         L2. |    .272286   .2564399     1.06   0.288     -.230327    .7748991
             |
```

```
      revtot |
         L1. |   .0010685   .0076813     0.14   0.889    -.0139865    .0161235
         L2. |   -.009993   .0054128    -1.85   0.065    -.0206019    .0006159
             |
       _cons |   1.202452   .3222878     3.73   0.000     .5707799    1.834125
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |    58.2504   27.08017     2.15   0.031     5.174241    111.3266
         L2. |   7.880779   13.65128     0.58   0.564    -18.87525     34.6368
             |
      revtot |
         L1. |    .187216   .4089038     0.46   0.647    -.6142207    .9886527
         L2. |  -.5051611   .2881441    -1.75   0.080    -1.069913     .059591
             |
       _cons |   39.57473   17.15662     2.31   0.021     5.948374    73.20109
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  6.7805     2    0.034    |
  |               env                ALL |  6.7805     2    0.034    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  13.065     2    0.001    |
  |            revtot                ALL |  13.065     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  .4022818                         AIC             =   2.39943
FPE            =  .0582128                         HQIC            =  1.729678
Det(Sigma_ml)  =  .0031001                         SBIC            =  2.498731

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .065467   0.7342   22.09912   0.0002
cos                  5     3.10414   0.8749   55.94841   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .4682717   .4647832     1.01   0.314    -.4426867     1.37923
         L2. |   .2100503   .2418731     0.87   0.385    -.2640123    .6841129
             |
```

```
         cos |
         L1. |  -.0001931   .0089682    -0.02   0.983    -.0177704    .0173842
         L2. |  -.0128329   .0070812    -1.81   0.070    -.0267118     .001046
             |
       _cons |   1.241741   .3372282     3.68   0.000     .5807856    1.902696
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   49.13294   22.03782     2.23   0.026     5.939597    92.32628
         L2. |   .7955912   11.46848     0.07   0.945    -21.68222     23.2734
             |
         cos |
         L1. |   .1113059   .4252282     0.26   0.794     -.722126    .9447379
         L2. |  -.4377799   .3357571    -1.30   0.192    -1.095852     .220292
             |
       _cons |   24.45221   15.98977     1.53   0.126    -6.887155    55.79157
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  7.0221     2    0.030    |
  |               env                ALL |  7.0221     2    0.030    |
  |--------------------------------------+---------------------------|
  |               cos                env |  12.672     2    0.002    |
  |               cos                ALL |  12.672     2    0.002    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  24.65534                         AIC             = -3.663835
FPE            =  .0001354                         HQIC            = -4.333587
Det(Sigma_ml)  =  7.21e-06                         SBIC            = -3.564533

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .07425   0.6581   15.39946   0.0039
ni                   5     .816953   0.7546   24.60482   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1698498   .7311609     0.23   0.816    -1.263199    1.602899
         L2. |   .0286435   .2173133     0.13   0.895    -.3972827    .4545697
             |
```

```
          ni |
         L1. |   .0486746    .056642     0.86   0.390    -.0623416    .1596909
         L2. |  -.0497378   .0260209    -1.91   0.056    -.1007379    .0012623
             |
       _cons |   .9931459   .5215583     1.90   0.057    -.0290896    2.015381
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   12.47627   8.044773     1.55   0.121    -3.291196    28.24374
         L2. |  -1.204813   2.391041    -0.50   0.614    -5.891168    3.481542
             |
          ni |
         L1. |  -.1440294   .6232172    -0.23   0.817    -1.365513    1.077454
         L2. |  -.5144524   .2863016    -1.80   0.072    -1.075593    .0466885
             |
       _cons |  -5.143683    5.73857    -0.90   0.370    -16.39107    6.103708
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  3.6784     2    0.159     |
  |               env                ALL |  3.6784     2    0.159     |
  |--------------------------------------+---------------------------|
  |                ni                env |  3.0507     2    0.218     |
  |                ni                ALL |  3.0507     2    0.218     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ca

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  6.228163                         AIC             =  .9429594
FPE            =  .0135669                         HQIC            =  .2732078
Det(Sigma_ml)  =  .0007225                         SBIC            =  1.042261

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .044682   0.8762   56.61501   0.0000
ca                   5     1.75344   0.9498   151.5124   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7751374   .4509062    -1.72   0.086    -1.658897    .1086226
         L2. |  -.0479499   .1244685    -0.39   0.700    -.2919037    .1960038
             |
```

```
          ca |
         L1. |   .0445254    .014275     3.12   0.002      .016547    .0725038
         L2. |  -.0346304   .0083796    -4.13   0.000    -.0510541   -.0182068
             |
       _cons |   1.654203   .2647948     6.25   0.000     1.135215    2.173191
-------------+----------------------------------------------------------------
ca           |
         env |
         L1. |  -104.4926   17.69475    -5.91   0.000    -139.1737   -69.81156
         L2. |   14.67233   4.884473     3.00   0.003     5.098941    24.24572
             |
          ca |
         L1. |    3.58647   .5601871     6.40   0.000     2.488524    4.684417
         L2. |  -2.062385   .3288359    -6.27   0.000    -2.706892   -1.417879
             |
       _cons |   81.16919   10.39125     7.81   0.000     60.80272    101.5357
------------------------------------------------------------------------------

. est store careg

. vargranger, estimates (careg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ca |  24.249     2    0.000    |
  |               env                ALL |  24.249     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ca                env |  40.529     2    0.000    |
  |                ca                ALL |  40.529     2    0.000    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ca

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  6.228163                         AIC             =  .9429594
FPE            =  .0135669                         HQIC            =  .2732078
Det(Sigma_ml)  =  .0007225                         SBIC            =  1.042261

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .044682   0.8762   56.61501   0.0000
ca                   5     1.75344   0.9498   151.5124   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7751374   .4509062    -1.72   0.086    -1.658897    .1086226
         L2. |  -.0479499   .1244685    -0.39   0.700    -.2919037    .1960038
```

```
             |
          ca |
         L1. |   .0445254    .014275     3.12   0.002      .016547    .0725038
         L2. |  -.0346304   .0083796    -4.13   0.000    -.0510541   -.0182068
             |
       _cons |   1.654203   .2647948     6.25   0.000     1.135215    2.173191
-------------+----------------------------------------------------------------
ca           |
         env |
         L1. |  -104.4926   17.69475    -5.91   0.000    -139.1737   -69.81156
         L2. |   14.67233   4.884473     3.00   0.003     5.098941    24.24572
             |
          ca |
         L1. |    3.58647   .5601871     6.40   0.000     2.488524    4.684417
         L2. |  -2.062385   .3288359    -6.27   0.000    -2.706892   -1.417879
             |
       _cons |   81.16919   10.39125     7.81   0.000     60.80272    101.5357
------------------------------------------------------------------------------

. est store tareg

. vargranger, estimates (tareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ca |  24.249     2    0.000    |
  |               env                ALL |  24.249     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ca                env |  40.529     2    0.000    |
  |                ca                ALL |  40.529     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  8.170961                         AIC             =  .4572597
FPE            =  .0083473                         HQIC            = -.2124919
Det(Sigma_ml)  =  .0004445                         SBIC            =  .5565616

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .047152   0.8621   50.02397   0.0000
cl                   5     1.44106   0.9071   78.08412   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1825124   .3454631    -0.53   0.597    -.8596077    .4945828
         L2. |   .1405185    .189277     0.74   0.458    -.2304577    .5114947
```

```
             |
          cl |
         L1. |   .0359209   .0085287     4.21   0.000     .0192049    .0526369
         L2. |  -.0151565   .0058416    -2.59   0.009    -.0266058   -.0037072
             |
       _cons |   .8224545   .1804078     4.56   0.000     .4688617    1.176047
-------------+----------------------------------------------------------------
cl           |
         env |
         L1. |    4.32024   10.55818     0.41   0.682    -16.37341     25.0139
         L2. |  -11.77496   5.784761    -2.04   0.042    -23.11288   -.4370325
             |
          cl |
         L1. |   1.098363   .2606585     4.21   0.000     .5874814    1.609244
         L2. |  -.6704318   .1785328    -3.76   0.000     -1.02035   -.3205139
             |
       _cons |   21.99345   5.513695     3.99   0.000      11.1868    32.80009
------------------------------------------------------------------------------

. est store clreg

. vargranger, estimates (clreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 cl |  20.959     2    0.000    |
  |               env                ALL |  20.959     2    0.000    |
  |--------------------------------------+---------------------------|
  |                cl                env |  21.116     2    0.000    |
  |                cl                ALL |  21.116     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  29.44383                         AIC             = -4.860958
FPE            =  .0000409                         HQIC            = -5.530709
Det(Sigma_ml)  =  2.18e-06                         SBIC            = -4.761656

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .084397   0.5583   10.11095   0.0386
ltd                  5     .058807   0.9858   556.2065   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7541312   .4405963     1.71   0.087    -.1094217    1.617684
         L2. |  -.4626542    .264644    -1.75   0.080     -.981347    .0560385
```

```
             |
         ltd |
         L1. |  -.0645383   .3961894    -0.16   0.871    -.8410553    .7119786
         L2. |  -.2186896    .218093    -1.00   0.316    -.6461441    .2087649
             |
       _cons |   .8744366   .5331828     1.64   0.101    -.1705825    1.919456
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -.9472866   .3070037    -3.09   0.002    -1.549003   -.3455704
         L2. |   1.310714   .1844017     7.11   0.000     .9492931    1.672134
             |
         ltd |
         L1. |   3.743324   .2760613    13.56   0.000     3.202253    4.284394
         L2. |   .1334361   .1519653     0.88   0.380    -.1644105    .4312827
             |
       _cons |  -.4212113   .3715172    -1.13   0.257    -1.149372     .306949
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  1.039     2    0.595     |
  |               env                ALL |  1.039     2    0.595     |
  |--------------------------------------+---------------------------|
  |               ltd                env | 50.705     2    0.000     |
  |               ltd                ALL | 50.705     2    0.000     |
  +------------------------------------------------------------------+

. ca
last estimates not found
r(301);

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  9.961995                         AIC             =  .0095012
FPE            =  .0053344                         HQIC            = -.6602504
Det(Sigma_ml)  =  .0002841                         SBIC            =  .1088031

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .034809   0.9249   98.4652   0.0000
tl                    5     1.83027   0.8557   47.4466   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
env          |
         env |
         L1. |  -.2695881   .2617134    -1.03   0.303     -.782537    .2433608
         L2. |    .143601   .1360907     1.06   0.291    -.1231319    .4103339
             |
          tl |
         L1. |   .0353075    .005966     5.92   0.000     .0236144    .0470007
         L2. |  -.0151171   .0035559    -4.25   0.000    -.0220865   -.0081478
             |
       _cons |   .9139752   .1266643     7.22   0.000     .6657178    1.162233
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   6.164672   13.76086     0.45   0.654    -20.80611    33.13546
         L2. |  -13.25855   7.155632    -1.85   0.064    -27.28333     .766236
             |
          tl |
         L1. |   .9532959   .3136916     3.04   0.002     .3384717     1.56812
         L2. |  -.6911806   .1869662    -3.70   0.000    -1.057628   -.3247335
             |
       _cons |   26.46046    6.65999     3.97   0.000     13.40712     39.5138
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  45.135     2    0.000    |
  |               env                ALL |  45.135     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  16.175     2    0.000    |
  |                tl                ALL |  16.175     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  4.188816                         AIC             =  1.452796
FPE            =  .0225892                         HQIC            =  .7830445
Det(Sigma_ml)  =   .001203                         SBIC            =  1.552098

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .059769   0.7785   28.11113   0.0000
oe                    5     2.78359   0.9601   192.6007   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
env          |
         env |
         L1. |  -.0418158   .4177748    -0.10   0.920    -.8606393    .7770078
         L2. |   .4111148   .2443076     1.68   0.092    -.0677194     .889949
             |
          oe |
         L1. |    .007187   .0116493     0.62   0.537    -.0156453    .0300192
         L2. |  -.015615    .0108604    -1.44   0.150     -.036901     .005671
             |
       _cons |   1.222804   .3141148     3.89   0.000     .6071507    1.838458
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   11.81679   19.45666     0.61   0.544    -26.31756    49.95114
         L2. |   7.042321   11.37793     0.62   0.536      -15.258    29.34264
             |
          oe |
         L1. |   .5547254   .5425335     1.02   0.307    -.5086207    1.618072
         L2. |   .1618732   .5057923     0.32   0.749    -.8294614    1.153208
             |
       _cons |  -2.809493   14.62899    -0.19   0.848    -31.48179     25.8628
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  10.023     2    0.007    |
  |               env                ALL |  10.023     2    0.007    |
  |--------------------------------------+---------------------------|
  |                oe                env |  3.3184     2    0.190    |
  |                oe                ALL |  3.3184     2    0.190    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 1.log
  log type:  text
 closed on:   2 Jul 2012, 16:42:02
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 2.log
  log type:  text
 opened on:   2 Jul 2012, 16:45:46

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =          8
```

```
Log likelihood = -49.76009                        AIC              =  14.94002
FPE            =  16267.81                        HQIC             =  14.27027
Det(Sigma_ml)  =  866.3328                        SBIC             =  15.03933

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.70179   0.7688   26.6084   0.0000
revtot               5      48.8829   0.9665   230.6121  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    -.90167   .4505301    -2.00   0.045    -1.784693   -.0186472
         L2. |   .3465505   .2700477     1.28   0.199    -.1827333    .8758344
             |
      revtot |
         L1. |   .0082658   .0062974     1.31   0.189     -.004077    .0206085
         L2. |   .0021128   .0043062     0.49   0.624    -.0063272    .0105528
             |
       _cons |   4.488889   3.060129     1.47   0.142    -1.508854    10.48663
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -28.35135   12.94123    -2.19   0.028    -53.71569    -2.98701
         L2. |   9.725348   7.756971     1.25   0.210    -5.478037    24.92873
             |
      revtot |
         L1. |   1.683852   .1808905     9.31   0.000     1.329313    2.038391
         L2. |  -.9638789   .1236932    -7.79   0.000    -1.206313   -.7214447
             |
       _cons |     619.16   87.90051     7.04   0.000     446.8781    791.4418
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  3.7414     2    0.154    |
  |               env                ALL |  3.7414     2    0.154    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  13.039     2    0.001    |
  |            revtot                ALL |  13.039     2    0.001    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression
```

```
Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -44.1759                         AIC             =  13.54397
FPE            =  4027.475                         HQIC            =  12.87422
Det(Sigma_ml)  =  214.4809                         SBIC            =  13.64328

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.65739   0.7807   28.48721   0.0000
cos                  5     24.9778   0.9879   653.5367   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.9087487   .4294052    -2.12   0.034    -1.750368   -.0671299
         L2. |   .2697277   .2841482     0.95   0.342    -.2871925    .8266479
             |
         cos |
         L1. |   .0122703   .0093258     1.32   0.188    -.0060079    .0305486
         L2. |   .0008346   .0068174     0.12   0.903    -.0125271    .0141964
             |
       _cons |   7.063989   2.905193     2.43   0.015     1.369915    12.75806
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |    -7.5806   6.471365    -1.17   0.241    -20.26424    5.103043
         L2. |   5.939354   4.282264     1.39   0.165     -2.45373    14.33244
             |
         cos |
         L1. |   1.962224   .1405448    13.96   0.000     1.686762    2.237687
         L2. |  -1.348378   .1027412   -13.12   0.000    -1.549747   -1.147009
             |
       _cons |   379.8268    43.7828     8.68   0.000     294.0141    465.6395
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  4.3788     2    0.112    |
  |               env                ALL |  4.3788     2    0.112    |
  |--------------------------------------+---------------------------|
  |               cos                env |  7.4897     2    0.024    |
  |               cos                ALL |  7.4897     2    0.024    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression
```

```
Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood = -45.75332                      AIC             =  13.93833
FPE            =  5974.471                      HQIC            =  13.26858
Det(Sigma_ml)  =  318.1671                      SBIC            =  14.03763

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.66757   0.7780   28.04333   0.0000
ni                   5     36.2468   0.7318   21.82376   0.0002
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7004648   .3789821    -1.85   0.065    -1.443256    .0423265
         L2. |   .7936431   .1792327     4.43   0.000     .4423535    1.144933
             |
          ni |
         L1. |   .0251062    .012366     2.03   0.042     .0008692    .0493431
         L2. |  -.0008861   .0117348    -0.08   0.940    -.0238859    .0221136
             |
       _cons |   11.19977   4.455577     2.51   0.012     2.466995    19.93254
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   -9.76514   8.237674    -1.19   0.236    -25.91069    6.380404
         L2. |   15.41027   3.895858     3.96   0.000     7.774532    23.04601
             |
          ni |
         L1. |   .6380778   .2687917     2.37   0.018     .1112557      1.1649
         L2. |  -.5538244   .2550708    -2.17   0.030    -1.053754   -.0538947
             |
       _cons |   -26.4706   96.84782    -0.27   0.785    -216.2888    163.3476
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  4.2282     2    0.121    |
  |               env                ALL |  4.2282     2    0.121    |
  |--------------------------------------+---------------------------|
  |                ni                env |   17.05     2    0.000    |
  |                ni                ALL |   17.05     2    0.000    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra
```

```
Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -46.88499                         AIC             =  14.22125
FPE            =  7928.097                         HQIC            =   13.5515
Det(Sigma_ml)  =  422.2063                         SBIC            =  14.32055

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.82618   0.7338   22.05406   0.0002
curra                5     30.3019   0.9260   100.0696   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.6110613   .3772309    -1.62   0.105     -1.35042    .1282977
         L2. |   .5490506   .2263995     2.43   0.015     .1053157    .9927854
             |
       curra |
         L1. |   .0150847    .012923     1.17   0.243     -.010244    .0404134
         L2. |   .0005945   .0092291     0.06   0.949    -.0174943    .0186832
             |
       _cons |   3.654062   3.787692     0.96   0.335    -3.769678     11.0778
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   1.068442   6.259408     0.17   0.864    -11.19977    13.33666
         L2. |   8.007116   3.756656     2.13   0.033     .6442046    15.37003
             |
       curra |
         L1. |    1.13111   .2144325     5.27   0.000     .7108298     1.55139
         L2. |  -.7108075   .1531395    -4.64   0.000    -1.010955   -.4106597
             |
       _cons |   271.1726   62.84933     4.31   0.000     147.9901     394.355
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.1963     2    0.333    |
  |               env                ALL |  2.1963     2    0.333    |
  |--------------------------------------+---------------------------|
  |             curra                env |  4.8094     2    0.090    |
  |             curra                ALL |  4.8094     2    0.090    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ass
```

```
Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -46.97236                         AIC             =  14.24309
FPE            =  8103.164                         HQIC            =  13.57334
Det(Sigma_ml)  =  431.5295                         SBIC            =  14.34239

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.66286   0.7793   28.24751   0.0000
ass                  5      34.8509   0.9334   112.1353   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7308631   .3442687    -2.12   0.034    -1.405617   -.0561089
         L2. |   .4345239   .2369691     1.83   0.067     -.029927    .8989749
             |
         ass |
         L1. |    .006049   .0083068     0.73   0.466    -.0102321      .02233
         L2. |   .0106157    .007754     1.37   0.171    -.0045819    .0258132
             |
       _cons |   -5.60793   6.620395    -0.85   0.397    -18.58367    7.367806
-------------+----------------------------------------------------------------
ass          |
         env |
         L1. |   23.36652     7.2153     3.24   0.001     9.224792    37.50825
         L2. |   13.78809   4.966479     2.78   0.005     4.053965    23.52221
             |
         ass |
         L1. |   .8511298    .174097     4.89   0.000      .509906    1.192354
         L2. |  -.7435943   .1625111    -4.58   0.000     -1.06211   -.4250785
             |
       _cons |   760.8359   138.7525     5.48   0.000      488.886    1032.786
------------------------------------------------------------------------------

. est store assreg

. vargranger, estimates (assreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ass |  4.2975     2    0.117    |
  |               env                ALL |  4.2975     2    0.117    |
  |--------------------------------------+---------------------------|
  |               ass                env |  13.353     2    0.001    |
  |               ass                ALL |  13.353     2    0.001    |
  +------------------------------------------------------------------+

.
. clear

. *(12 variables, 0 observation pasted into data editor)
```

```
. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -46.97236                         AIC             =  14.24309
FPE            =  8103.164                         HQIC            =  13.57334
Det(Sigma_ml)  =  431.5295                         SBIC            =  14.34239

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.66286   0.7793   28.24751   0.0000
asset                5      34.8509   0.9334   112.1353   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7308631   .3442687    -2.12   0.034    -1.405617   -.0561089
         L2. |   .4345239   .2369691     1.83   0.067     -.029927    .8989749
             |
       asset |
         L1. |    .006049   .0083068     0.73   0.466    -.0102321      .02233
         L2. |   .0106157    .007754     1.37   0.171    -.0045819    .0258132
             |
       _cons |   -5.60793   6.620395    -0.85   0.397    -18.58367    7.367806
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   23.36652     7.2153     3.24   0.001     9.224792    37.50825
         L2. |   13.78809   4.966479     2.78   0.005     4.053965    23.52221
             |
       asset |
         L1. |   .8511298    .174097     4.89   0.000      .509906    1.192354
         L2. |  -.7435943   .1625111    -4.58   0.000     -1.06211   -.4250785
             |
       _cons |   760.8359   138.7525     5.48   0.000      488.886    1032.786
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  4.2975     2    0.117    |
  |               env                ALL |  4.2975     2    0.117    |
  |--------------------------------------+---------------------------|
  |             asset                env |  13.353     2    0.001    |
  |             asset                ALL |  13.353     2    0.001    |
```

```
  +-------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -43.00112                         AIC             =  13.25028
FPE            =  3002.502                         HQIC            =  12.58053
Det(Sigma_ml)  =  159.8965                         SBIC            =  13.34958

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.76716   0.7507   24.09508   0.0001
currl                5      19.4317   0.9384    121.851   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5991118   .3386467    -1.77   0.077    -1.262847    .0646237
         L2. |   .4807734   .2373556     2.03   0.043     .0155649    .9459819
             |
       currl |
         L1. |   .0221389   .0179174     1.24   0.217    -.0129787    .0572564
         L2. |   .0024128   .0144255     0.17   0.867    -.0258607    .0306863
             |
       _cons |     3.4178   3.557832     0.96   0.337    -3.555423    10.39102
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |    9.45973   3.723757     2.54   0.011     2.161301    16.75816
         L2. |   2.351564    2.60996     0.90   0.368    -2.763864    7.466993
             |
       currl |
         L1. |   1.209488   .1970201     6.14   0.000     .8233356     1.59564
         L2. |  -.9725783   .1586229    -6.13   0.000    -1.283473   -.6616832
             |
       _cons |   194.9372    39.1219     4.98   0.000     118.2597    271.6147
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  2.8887     2    0.236    |
  |               env                ALL |  2.8887     2    0.236    |
  |--------------------------------------+---------------------------|
  |             currl                env |  6.4601     2    0.040    |
```

```
  |             currl                ALL |  6.4601     2    0.040    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.43464                         AIC             =  12.10866
FPE            =   958.701                         HQIC            =  11.43891
Det(Sigma_ml)  =  51.05508                         SBIC            =  12.20796

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.68522   0.7733   27.29223   0.0000
ltd                  5     12.7252   0.9720   277.8134   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.132006   .5408067    -2.09   0.036    -2.191967   -.0720443
         L2. |   .4672035   .2435813     1.92   0.055     -.010207     .944614
             |
         ltd |
         L1. |  -.0435756   .0256403    -1.70   0.089    -.0938296    .0066784
         L2. |   .0042297   .0162158     0.26   0.794    -.0275526     .036012
             |
       _cons |   27.30527   10.86487     2.51   0.012     6.010509    48.60003
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   20.36641    4.08367     4.99   0.000     12.36256    28.37026
         L2. |  -10.43867     1.8393    -5.68   0.000    -14.04363   -6.833705
             |
         ltd |
         L1. |   1.831793   .1936115     9.46   0.000     1.452322    2.211265
         L2. |   -1.02692   .1224464    -8.39   0.000     -1.26691   -.7869292
             |
       _cons |  -89.09863   82.04144    -1.09   0.277    -249.8969    71.69963
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  3.9734     2    0.137    |
  |               env                ALL |  3.9734     2    0.137    |
  |--------------------------------------+---------------------------|
```

```
  |              ltd                env |  84.068     2    0.000     |
  |              ltd                ALL |  84.068     2    0.000     |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -39.87988                        AIC             =  12.46997
FPE            =  1375.935                        HQIC            =  11.80022
Det(Sigma_ml)  =  73.27465                        SBIC            =  12.56927

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.27165   0.8709   53.98025   0.0000
tl                   5     24.1825   0.6636   15.78146   0.0033
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.057977   .3050809    -3.47   0.001    -1.655925   -.4600297
         L2. |   .9732063   .1698992     5.73   0.000     .6402099    1.306203
             |
          tl |
         L1. |  -.0228235   .0119974    -1.90   0.057     -.046338     .000691
         L2. |   .0399792   .0110786     3.61   0.000     .0182655    .0616928
             |
       _cons |   1.245287   8.105838     0.15   0.878    -14.64186    17.13244
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   14.77975    5.80158     2.55   0.011     3.408865    26.15064
         L2. |  -9.393126   3.230893    -2.91   0.004    -15.72556   -3.060691
             |
          tl |
         L1. |   .3669272   .2281492     1.61   0.108     -.080237    .8140914
         L2. |  -.6208111   .2106765    -2.95   0.003     -1.03373   -.2078926
             |
       _cons |   890.9169   154.1449     5.78   0.000     588.7984    1193.035
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |              env                 tl |  13.028     2    0.001     |
  |              env                ALL |  13.028     2    0.001     |
```

```
  |------------------------------------+---------------------------|
  |             tl                env  |  9.7818     2    0.008    |
  |             tl                ALL  |  9.7818     2    0.008    |
  +----------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -40.73616                        AIC             =  12.68404
FPE            =  1704.384                        HQIC            =  12.01429
Det(Sigma_ml)  =    90.766                        SBIC            =  12.78334

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.79006   0.7442   23.27912   0.0001
oe                   5     17.1483   0.9863   577.6105   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.6903927   .3909492    -1.77   0.077    -1.456639    .0758537
         L2. |   .6320875   .2064839     3.06   0.002     .2273865    1.036788
             |
          oe |
         L1. |   .0158328   .0103107     1.54   0.125    -.0043759    .0360415
         L2. |  -.0041998   .0077369    -0.54   0.587    -.0193638    .0109641
             |
       _cons |    7.05053   3.211669     2.20   0.028     .7557745    13.34529
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   -2.82535   3.745188    -0.75   0.451    -10.16578    4.515084
         L2. |   25.58488    1.97806    12.93   0.000     21.70796    29.46181
             |
          oe |
         L1. |   .9904654   .0987741    10.03   0.000     .7968717    1.184059
         L2. |  -.7040913    .074117    -9.50   0.000     -.849358   -.5588245
             |
       _cons |   155.7858   30.76692     5.06   0.000     95.48374    216.0878
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |------------------------------------+---------------------------|
  |            env                  oe |  2.6119     2    0.271    |
```

```
  |              env               ALL |  2.6119     2    0.271     |
  |------------------------------------+--------------------------|
  |               oe               env |  175.11     2    0.000     |
  |               oe               ALL |  175.11     2    0.000     |
  +---------------------------------------------------------------+

.
. *(12 variables, 10 observations pasted into data editor)

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 2.log
  log type:  text
 closed on:   2 Jul 2012, 16:51:31
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 3.log
  log type:  text
 opened on:   2 Jul 2012, 16:51:40

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -16.19722                         AIC             =  6.549304
FPE            =  3.692207                         HQIC            =  5.879553
Det(Sigma_ml)  =  .1966264                         SBIC            =  6.648606

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .502034   0.9207   92.89466   0.0000
revtot               5     2.49794   0.8827   60.20935   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7732389   .1761267    -4.39   0.000    -1.118441   -.4280368
         L2. |  -.0112133    .058827    -0.19   0.849    -.1265122    .1040855
             |
      revtot |
         L1. |   .4181538   .0763901     5.47   0.000      .268432    .5678756
         L2. |  -.4858797   .0581905    -8.35   0.000    -.5999309   -.3718285
             |
       _cons |   24.70471   1.975794    12.50   0.000     20.83223     28.5772
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   .0904393   .8763433     0.10   0.918    -1.627162    1.808041
         L2. |  -.2912603   .2927022    -1.00   0.320    -.8649461    .2824254
             |
```

```
      revtot |
         L1. |   1.395286   .3800896     3.67   0.000      .650324    2.140248
         L2. |  -.9888049   .2895348    -3.42   0.001    -1.556283   -.4213271
             |
       _cons |   23.44226    9.83084     2.38   0.017     4.174169    42.71035
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |                env            revtot |  83.803     2    0.000    |
  |                env               ALL |  83.803     2    0.000    |
  |--------------------------------------+---------------------------|
  |             revtot               env |   .9921     2    0.609    |
  |             revtot               ALL |   .9921     2    0.609    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -12.93176                         AIC             =  5.732939
FPE            =  1.632086                         HQIC            =  5.063188
Det(Sigma_ml)  =  .0869158                         SBIC            =  5.832241

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .71399   0.8396   41.88273   0.0000
cos                  5     1.69114   0.8584   48.48335   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7901646   .2690921    -2.94   0.003    -1.317575   -.2627539
         L2. |  -.0301399   .0916174    -0.33   0.742    -.2097066    .1494269
             |
         cos |
         L1. |   .6941226   .2073994     3.35   0.001     .2876273    1.100618
         L2. |  -.8301271   .1615524    -5.14   0.000    -1.146764   -.5134902
             |
       _cons |   25.78852   3.100442     8.32   0.000     19.71177    31.86528
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   .5441676   .6373631     0.85   0.393    -.7050412    1.793376
         L2. |  -.1668964   .2170021    -0.77   0.442    -.5922126    .2584199
```

```
             |
         cos |
         L1. |   1.123837   .4912397     2.29   0.022     .1610247    2.086649
         L2. |  -.7751684    .382648    -2.03   0.043    -1.525145    -.025192
             |
       _cons |   10.23459   7.343612     1.39   0.163    -4.158629     24.6278
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  37.388     2    0.000    |
  |               env                ALL |  37.388     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  1.4542     2    0.483    |
  |               cos                ALL |  1.4542     2    0.483    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -6.92523                         AIC             =  4.231308
FPE            =   .363574                         HQIC            =  3.561556
Det(Sigma_ml)  =  .0193619                         SBIC            =  4.330609

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .404122   0.9486   147.7075   0.0000
ni                   5     1.00248   0.8819   59.71826   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8660836   .1578762    -5.49   0.000    -1.175515    -.556652
         L2. |   .3457159   .0513377     6.73   0.000     .2450959    .4463358
             |
          ni |
         L1. |    .759189   .0989584     7.67   0.000      .565234    .9531439
         L2. |  -.9889741   .0865443   -11.43   0.000    -1.158598   -.8193504
             |
       _cons |   19.60475   1.574121    12.45   0.000     16.51953    22.68997
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -1.572193   .3916334    -4.01   0.000    -2.339781   -.8046057
```

```
         L2. |   .6860846   .1273501     5.39   0.000      .436483    .9356862
             |
          ni |
         L1. |   1.313606     .24548     5.35   0.000      .832474    1.794738
         L2. |  -1.410899    .214685    -6.57   0.000    -1.831674   -.9901246
             |
       _cons |    12.2233   3.904822     3.13   0.002     4.569989    19.87661
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  133.68     2    0.000    |
  |               env                ALL |  133.68     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ni                env |  29.046     2    0.000    |
  |                ni                ALL |  29.046     2    0.000    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curraest store revtotreg
variable curraest not found
r(111);

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  83.803     2    0.000    |
  |               env                ALL |  83.803     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |   .9921     2    0.609    |
  |            revtot                ALL |   .9921     2    0.609    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -20.41062                         AIC             =  7.602656
FPE            =  10.58646                         HQIC            =  6.932904
Det(Sigma_ml)  =  .5637758                         SBIC            =  7.701958
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.22498   0.5279   8.946348   0.0625
curra                5     3.53776   0.4230   5.865558   0.2094
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2409336   .4106877    -0.59   0.557    -1.045867    .5639995
         L2. |   .0082826   .1618708     0.05   0.959    -.3089783    .3255436
             |
       curra |
         L1. |   .2129996   .1973044     1.08   0.280      -.17371    .5997092
         L2. |  -.4819468   .1781026    -2.71   0.007    -.8310214   -.1328722
             |
       _cons |   23.27255   6.711951     3.47   0.001     10.11737    36.42773
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   .5513803    1.18607     0.46   0.642    -1.773273    2.876034
         L2. |  -.1861374   .4674843    -0.40   0.691     -1.10239    .7301149
             |
       curra |
         L1. |   .4775763   .5698169     0.84   0.402    -.6392442    1.594397
         L2. |  -.6148546   .5143617    -1.20   0.232    -1.622985    .3932759
             |
       _cons |   26.41542   19.38417     1.36   0.173    -11.57686     64.4077
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  7.4193     2    0.024    |
  |               env                ALL |  7.4193     2    0.024    |
  |--------------------------------------+---------------------------|
  |             curra                env |  .22446     2    0.894    |
  |             curra                ALL |  .22446     2    0.894    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -22.5887                         AIC             =  8.147174
FPE            =   18.2487                         HQIC            =  7.477422
Det(Sigma_ml)  =  .9718243                         SBIC            =  8.246476
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5       1.0146   0.6761   16.70268   0.0022
asset                5      3.02268   0.6934   18.09602   0.0012
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2560592   .2849243    -0.90   0.369    -.8145005    .3023822
         L2. |    -.01863   .1064203    -0.18   0.861    -.2272099      .18995
             |
       asset |
         L1. |   .0937603   .1015338     0.92   0.356    -.1052424     .292763
         L2. |  -.3949547   .1095355    -3.61   0.000    -.6096403   -.1802691
             |
       _cons |   33.57114   7.083058     4.74   0.000      19.6886    47.45368
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   .1321282   .8488397     0.16   0.876    -1.531567    1.795823
         L2. |   .0893628   .3170448     0.28   0.778    -.5320336    .7107592
             |
       asset |
         L1. |   .7187357   .3024872     2.38   0.017     .1258716      1.3116
         L2. |  -.8031152   .3263255    -2.46   0.014    -1.442701   -.1635289
             |
       _cons |   59.46444   21.10168     2.82   0.005     18.10591     100.823
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  14.477     2    0.001    |
  |               env                ALL |  14.477     2    0.001    |
  |--------------------------------------+---------------------------|
  |             asset                env |  .21861     2    0.896    |
  |             asset                ALL |  .21861     2    0.896    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -17.03216                         AIC             =   6.75804
FPE            =  4.549237                         HQIC            =  6.088288
```

```
Det(Sigma_ml)  =  .2422671                        SBIC            =  6.857342

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.06698   0.6418   14.33685   0.0063
currl                5      1.4836   0.7197   20.54137   0.0004
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0082926   .2460768    -0.03   0.973    -.4905943    .4740091
         L2. |   .0450782   .1096162     0.41   0.681    -.1697655     .259922
             |
       currl |
         L1. |   .1440248   .1855072     0.78   0.438    -.2195627    .5076123
         L2. |  -.5837105   .1726718    -3.38   0.001     -.922141   -.2452801
             |
       _cons |   17.03352   3.151297     5.41   0.000     10.85709    23.20995
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   .7272965    .342162     2.13   0.034     .0566713    1.397922
         L2. |   .1584683   .1524178     1.04   0.298    -.1402651    .4572016
             |
       currl |
         L1. |   .1747619   .2579419     0.68   0.498    -.3307949    .6803187
         L2. |  -.2068308   .2400946    -0.86   0.389    -.6774076    .2637459
             |
       _cons |   .4289853   4.381778     0.10   0.922    -8.159143    9.017113
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  12.324     2    0.002    |
  |               env                ALL |  12.324     2    0.002    |
  |--------------------------------------+---------------------------|
  |             currl                env |  11.549     2    0.003    |
  |             currl                ALL |  11.549     2    0.003    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood =  18.06585                        AIC             = -2.016462
```

```
FPE             =  .0007034                         HQIC            = -2.686214
Det(Sigma_ml)   =  .0000375                         SBIC            =  -1.91716

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.01273   0.6773   16.79388   0.0021
ltd                  5     .020852   0.9824   445.9484   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1543897   .2470864    -0.62   0.532    -.6386702    .3298909
         L2. |   .5704574   .1979713     2.88   0.004     .1824407     .958474
             |
         ltd |
         L1. |   8.198945   10.19461     0.80   0.421    -11.78212    28.18001
         L2. |   16.15121   9.904102     1.63   0.103    -3.260471     35.5629
             |
       _cons |   1.061758   3.051406     0.35   0.728    -4.918888    7.042403
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   .0202659   .0050876     3.98   0.000     .0102945    .0302374
         L2. |   .0032245   .0040763     0.79   0.429    -.0047648    .0112138
             |
         ltd |
         L1. |   1.732733    .209909     8.25   0.000     1.321319    2.144147
         L2. |  -.3254676   .2039274    -1.60   0.110    -.7251579    .0742227
             |
       _cons |  -.4293555    .062829    -6.83   0.000    -.5524982   -.3062129
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  14.56      2    0.001    |
  |               env                ALL |  14.56      2    0.001    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  41.854     2    0.000    |
  |               ltd                ALL |  41.854     2    0.000    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                                No. of obs      =         8
```

```
Log likelihood = -17.28135                        AIC             =  6.820338
FPE            =  4.841663                        HQIC            =  6.150587
Det(Sigma_ml)  =    .25784                        SBIC            =   6.91964

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.11423   0.6094   12.48271   0.0141
tl                   5     1.42945   0.7582   25.08625   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0227413   .2571092    -0.09   0.930    -.5266662    .4811835
         L2. |   .0359494   .1143192     0.31   0.753    -.1881122     .260011
             |
          tl |
         L1. |   .0889929   .1806806     0.49   0.622    -.2651346    .4431204
         L2. |  -.5286697   .1739905    -3.04   0.002    -.8696848   -.1876546
             |
       _cons |   18.58192    3.70805     5.01   0.000     11.31428    25.84957
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   .7507095   .3298476     2.28   0.023       .10422    1.397199
         L2. |   .1821544   .1466611     1.24   0.214    -.1052962    .4696049
             |
          tl |
         L1. |   .2003188   .2317967     0.86   0.387    -.2539944     .654632
         L2. |  -.1640292   .2232139    -0.73   0.462    -.6015204    .2734619
             |
       _cons |   1.854711   4.757089     0.39   0.697    -7.469012    11.17843
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  10.637     2    0.005    |
  |               env                ALL |  10.637     2    0.005    |
  |--------------------------------------+---------------------------|
  |                tl                env |  14.132     2    0.001    |
  |                tl                ALL |  14.132     2    0.001    |
  +------------------------------------------------------------------+

.
. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression
```

```
Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -13.98632                        AIC             =  5.996579
FPE            =   2.12442                        HQIC            =  5.326827
Det(Sigma_ml)  =  .1131348                        SBIC            =  6.095881

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.03084   0.6657   15.93065   0.0031
oe                   5     .940813   0.9100   80.88093   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4675811   .3566097    -1.31   0.190    -1.166523     .231361
         L2. |  -.1561779   .1379148    -1.13   0.257    -.4264859    .1141301
             |
          oe |
         L1. |   .1542947     .20995     0.73   0.462    -.2571997    .5657891
         L2. |  -1.054656    .293508    -3.59   0.000    -1.629921   -.4793906
             |
       _cons |   60.12995   14.42625     4.17   0.000     31.85502    88.40487
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -1.223512   .3254666    -3.76   0.000    -1.861415   -.5856092
         L2. |  -.1392224   .1258705    -1.11   0.269    -.3859241    .1074793
             |
          oe |
         L1. |   1.145882   .1916148     5.98   0.000     .7703239     1.52144
         L2. |  -1.985198   .2678757    -7.41   0.000    -2.510224   -1.460171
             |
       _cons |   97.65237   13.16639     7.42   0.000     71.84673     123.458
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  13.774     2    0.001    |
  |               env                ALL |  13.774     2    0.001    |
  |--------------------------------------+---------------------------|
  |                oe                env |  24.139     2    0.000    |
  |                oe                ALL |  24.139     2    0.000    |
  +------------------------------------------------------------------+

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 3.log
  log type:  text
 closed on:   2 Jul 2012, 16:55:04
```

```
------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 4.log
  log type:  text
 opened on:   2 Jul 2012, 16:55:19

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -29.01276                         AIC             =  9.753189
FPE            =  90.93174                         HQIC            =  9.083438
Det(Sigma_ml)  =  4.842519                         SBIC            =  9.852491

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .576567   0.8209   36.66385   0.0000
revtot               5     10.3004   0.7564   24.84157   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4290165   .4435729    -0.97   0.333    -1.298403    .4403704
         L2. |   .2666751   .2169585     1.23   0.219    -.1585558    .6919059
             |
      revtot |
         L1. |   .0833766   .0271853     3.07   0.002     .0300944    .1366588
         L2. |   .0792353   .0464833     1.70   0.088    -.0118703    .1703409
             |
       _cons |  -24.45086   8.824416    -2.77   0.006     -41.7464   -7.155321
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   4.126802   7.924485     0.52   0.603     -11.4049    19.65851
         L2. |  -8.501214   3.875991    -2.19   0.028    -16.09802   -.9044125
             |
      revtot |
         L1. |    1.34393    .485669     2.77   0.006     .3920367    2.295824
         L2. |   -.860996     .83043    -1.04   0.300    -2.488609    .7666169
             |
       _cons |   114.4326   157.6493     0.73   0.468    -194.5544    423.4195
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+---------------------------|
  |              env           revtot |  11.271     2    0.004    |
  |              env              ALL |  11.271     2    0.004    |
  |------------------------------------+---------------------------|
  |           revtot              env |  5.1088     2    0.078    |
  |           revtot              ALL |  5.1088     2    0.078    |
  +----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.13128                         AIC             =  8.782821
FPE            =  34.45798                         HQIC            =  8.113069
Det(Sigma_ml)  =  1.835041                         SBIC            =  8.882123

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .777803   0.6740   16.54241   0.0024
cos                  5     6.61234   0.7796   28.29624   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1394094    .503542     0.28   0.782    -.8475148    1.126334
         L2. |  -.1897862   .3632121    -0.52   0.601    -.9016688    .5220964
             |
         cos |
         L1. |   .1126627   .0700206     1.61   0.108    -.0245752    .2499007
         L2. |   .0239301   .0701398     0.34   0.733    -.1135414    .1614016
             |
       _cons |  -11.41282   10.23475    -1.12   0.265    -31.47257    8.646919
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   17.43543   4.280762     4.07   0.000     9.045294    25.82557
         L2. |  -.6048221   3.087775    -0.20   0.845     -6.65675    5.447106
             |
         cos |
         L1. |  -.5150021   .5952665    -0.87   0.387    -1.681703    .6516988
         L2. |  -2.184926   .5962794    -3.66   0.000    -3.353613    -1.01624
             |
       _cons |   366.9743   87.00869     4.22   0.000     196.4404    537.5082
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+---------------------------|
  |              env               cos |  2.5892     2    0.274    |
  |              env               ALL |  2.5892     2    0.274    |
  |------------------------------------+---------------------------|
  |              cos               env |  17.387     2    0.000    |
  |              cos               ALL |  17.387     2    0.000    |
  +----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -19.07601                         AIC             =  7.269001
FPE            =  7.583094                         HQIC            =   6.59925
Det(Sigma_ml)  =  .4038334                         SBIC            =  7.368303

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .807564   0.6486   14.76685   0.0052
ni                   5     3.18836   0.8749   55.94264   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6966082   .4286328     1.63   0.104    -.1434967    1.536713
         L2. |    .412596    .413723     1.00   0.319    -.3982861    1.223478
             |
          ni |
         L1. |   .1090765   .0919973     1.19   0.236    -.0712348    .2893878
         L2. |  -.0954189   .1733455    -0.55   0.582      -.43517    .2443321
             |
       _cons |  -.2851816   1.651266    -0.17   0.863    -3.521604    2.951241
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   -2.65426   1.692296    -1.57   0.117      -5.9711    .6625798
         L2. |  -1.422626   1.633431    -0.87   0.384    -4.624091    1.778839
             |
          ni |
         L1. |   .6201021   .3632168     1.71   0.088    -.0917897    1.331994
         L2. |  -.4992569   .6843901    -0.73   0.466    -1.840637    .8421231
             |
       _cons |   27.09784   6.519408     4.16   0.000     14.32003    39.87564
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+--------------------------|
  |              env                ni |  1.8231     2    0.402   |
  |              env               ALL |  1.8231     2    0.402   |
  |------------------------------------+--------------------------|
  |               ni               env |  7.9252     2    0.019   |
  |               ni               ALL |  7.9252     2    0.019   |
  +---------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =          8
Log likelihood = -.9678365                      AIC             =   2.741959
FPE            =   .081993                      HQIC            =   2.072208
Det(Sigma_ml)  =  .0043665                      SBIC            =   2.841261

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .482387   0.8746   55.80666   0.0000
curra                5     2.57084   0.6406   14.25726   0.0065
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.057026    .304716     3.47   0.001     .4597942    1.654259
         L2. |  -.1198235   .2091432    -0.57   0.567    -.5297367    .2900897
             |
       curra |
         L1. |  -.0544985   .0654742    -0.83   0.405    -.1828255    .0738286
         L2. |  -.1130658   .0271084    -4.17   0.000    -.1661972   -.0599343
             |
       _cons |   16.36903   5.789321     2.83   0.005     5.022173     27.7159
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |    5.42435    1.62396     3.34   0.001     2.241447    8.607252
         L2. |   -3.35607   1.114612    -3.01   0.003     -5.54067   -1.171469
             |
       curra |
         L1. |  -.7518852   .3489396    -2.15   0.031    -1.435794   -.0679761
         L2. |  -.2302476    .144472    -1.59   0.111    -.5134075    .0529124
             |
       _cons |    175.593   30.85373     5.69   0.000     115.1208    236.0652
------------------------------------------------------------------------------

. est store curareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +---------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |-----------------------------------+---------------------------|
  |             env             curra |   19.53     2    0.000    |
  |             env               ALL |   19.53     2    0.000    |
  |-----------------------------------+---------------------------|
  |           curra               env |  11.308     2    0.004    |
  |           curra               ALL |  11.308     2    0.004    |
  +---------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -19.05128                         AIC             =  7.262819
FPE            =   7.53636                         HQIC            =  6.593068
Det(Sigma_ml)  =  .4013446                         SBIC            =  7.362121

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .320981   0.9445   136.1111   0.0000
asset                5     5.59736   0.9317   109.0976   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2771707    .257515     1.08   0.282    -.2275494    .7818909
         L2. |   .9956589   .1731967     5.75   0.000     .6561996    1.335118
             |
       asset |
         L1. |   .0634854   .0117948     5.38   0.000     .0403679    .0866028
         L2. |  -.0829008   .0142641    -5.81   0.000    -.1108579   -.0549437
             |
       _cons |   3.528834   2.996347     1.18   0.239    -2.343898    9.401566
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -3.471567   4.490619    -0.77   0.439    -12.27302    5.329884
         L2. |   9.112598   3.020252     3.02   0.003     3.193012    15.03218
             |
       asset |
         L1. |   1.456455   .2056818     7.08   0.000     1.053327    1.859584
         L2. |  -1.506147    .248741    -6.06   0.000     -1.99367   -1.018624
             |
       _cons |   215.8451   52.25113     4.13   0.000     113.4348    318.2554
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +---------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |-------------------------------------+---------------------------|
  |            env               asset  |  54.179     2    0.000    |
  |            env                 ALL  |  54.179     2    0.000    |
  |-------------------------------------+---------------------------|
  |          asset                 env  |  10.372     2    0.006    |
  |          asset                 ALL  |  10.372     2    0.006    |
  +-----------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -19.9428                         AIC             =  7.485699
FPE            =  9.417964                         HQIC            =  6.815947
Det(Sigma_ml)  =  .5015484                         SBIC            =  7.585001

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .403549   0.9123   83.17233   0.0000
currl                5      6.5375   0.7630   25.75978   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .3104349   .1754092     1.77   0.077    -.0333609    .6542306
         L2. |  -.2822713   .1797408    -1.57   0.116    -.6345567    .0700142
             |
       currl |
         L1. |   -.000673   .0139026    -0.05   0.961    -.0279216    .0265755
         L2. |  -.0529831   .0137771    -3.85   0.000    -.0799858   -.0259804
             |
       _cons |   9.264603   1.524654     6.08   0.000     6.276335    12.25287
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   5.401367    2.84163     1.90   0.057    -.1681255    10.97086
         L2. |   7.259736   2.911801     2.49   0.013     1.552711    12.96676
             |
       currl |
         L1. |  -.4580026   .2252215    -2.03   0.042    -.8994287   -.0165765
         L2. |   1.042842   .2231896     4.67   0.000     .6053981    1.480285
             |
       _cons |  -36.86298   24.69941    -1.49   0.136    -85.27292    11.54697
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +-----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+---------------------------|
  |              env             currl |  31.338     2    0.000     |
  |              env               ALL |  31.338     2    0.000     |
  |------------------------------------+---------------------------|
  |            currl               env |  18.419     2    0.000     |
  |            currl               ALL |  18.419     2    0.000     |
  +----------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -23.32143                         AIC             =  8.330358
FPE            =  21.91734                         HQIC            =  7.660607
Det(Sigma_ml)  =  1.167196                         SBIC            =   8.42966

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .659524   0.7656   26.13463   0.0000
ltd                  5     7.59708   0.6149   12.77311   0.0124
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .8492699    .292436     2.90   0.004     .2761059    1.422434
         L2. |   .0456656    .297449     0.15   0.878    -.5373237    .6286549
             |
         ltd |
         L1. |  -.0084758    .025244    -0.34   0.737    -.0579531    .0410014
         L2. |  -.1865211   .0743324    -2.51   0.012    -.3322099   -.0408322
             |
       _cons |   5.843904   1.992883     2.93   0.003     1.937925    9.749882
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   3.591394   3.368581     1.07   0.286    -3.010903    10.19369
         L2. |  -9.124952   3.426326    -2.66   0.008    -15.84043   -2.409477
             |
         ltd |
         L1. |  -.2955783   .2907861    -1.02   0.309    -.8655086    .2743519
         L2. |   -.342771   .8562376    -0.40   0.689    -2.020966    1.335424
             |
       _cons |   64.52327   22.95609     2.81   0.005     19.53017    109.5164
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+---------------------------|
  |              env               ltd |   6.728     2    0.035    |
  |              env               ALL |   6.728     2    0.035    |
  |------------------------------------+---------------------------|
  |              ltd               env |  9.9046     2    0.007    |
  |              ltd               ALL |  9.9046     2    0.007    |
  +----------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -18.84224                         AIC             =  7.210561
FPE            =  7.152633                         HQIC            =  6.540809
Det(Sigma_ml)  =  .3809095                         SBIC            =  7.309862

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .430817   0.9000   71.9965   0.0000
tl                   5     3.86697   0.9255   99.34855  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .479999   .1796559     2.67   0.008       .12788     .832118
         L2. |  -.2170148   .1842833    -1.18   0.239    -.5782034    .1441738
             |
          tl |
         L1. |   .0234562   .0264974     0.89   0.376    -.0284778    .0753902
         L2. |  -.0546232   .0176873    -3.09   0.002    -.0892897   -.0199567
             |
       _cons |   8.029531   2.148017     3.74   0.000     3.819496    12.23957
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   2.489549   1.612573     1.54   0.123    -.6710351    5.650133
         L2. |  -7.517237   1.654108    -4.54   0.000    -10.75923   -4.275245
             |
          tl |
         L1. |   .0248914   .2378383     0.10   0.917    -.4412631    .4910458
         L2. |   .2104734   .1587596     1.33   0.185    -.1006897    .5216365
             |
       _cons |   111.6093   19.28038     5.79   0.000     73.82047    149.3982
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+---------------------------|
  |               env               tl |  26.516     2    0.000     |
  |               env              ALL |  26.516     2    0.000     |
  |------------------------------------+---------------------------|
  |                tl              env |  23.258     2    0.000     |
  |                tl              ALL |  23.258     2    0.000     |
  +----------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -16.79275                         AIC             =  6.698186
FPE            =  4.284939                         HQIC            =  6.028435
Det(Sigma_ml)  =   .228192                         SBIC            =  6.797488

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .366162   0.9278   102.7411   0.0000
oe                   5     5.60795   0.9435   133.5417   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1986843    .206771    -0.96   0.337     -.603948    .2065794
         L2. |   -.203504   .4221446    -0.48   0.630    -1.030892    .6238843
             |
          oe |
         L1. |   .0347927   .0238783     1.46   0.145     -.012008    .0815934
         L2. |   .0214062   .0300249     0.71   0.476    -.0374415    .0802539
             |
       _cons |   1.291235   1.303791     0.99   0.322    -1.264148    3.846618
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -14.20303   3.166793    -4.48   0.000    -20.40983   -7.996227
         L2. |  -11.29495    6.46534    -1.75   0.081    -23.96679    1.376881
             |
          oe |
         L1. |   .6639391   .3657079     1.82   0.069    -.0528353    1.380714
         L2. |    .806473   .4598447     1.75   0.079    -.0948061    1.707752
             |
       _cons |   84.94598   19.96816     4.25   0.000     45.80911    124.0829
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
```

```
  |------------------------------------+---------------------------|
  |             env                 oe |  39.781     2    0.000    |
  |             env                ALL |  39.781     2    0.000    |
  |------------------------------------+---------------------------|
  |              oe                env |  29.289     2    0.000    |
  |              oe                ALL |  29.289     2    0.000    |
  +----------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 4.log
  log type:  text
 closed on:   2 Jul 2012, 16:59:37
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 5.log
  log type:  text
 opened on:   2 Jul 2012, 16:59:48

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -37.15409                         AIC             =  11.78852
FPE            =  696.0654                         HQIC            =  11.11877
Det(Sigma_ml)  =  37.06857                         SBIC            =  11.88783

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .950981   0.4443   6.396291   0.1714
revtot               5     19.2838   0.9401   125.6443   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.493258   .3852001    -1.28   0.200    -1.248236    .2617203
         L2. |   .0022996   .5697421     0.00   0.997    -1.114374    1.118974
             |
      revtot |
         L1. |   .0097799   .0137975     0.71   0.478    -.0172627    .0368226
         L2. |  -.0154963   .0135395    -1.14   0.252    -.0420332    .0110406
             |
       _cons |   10.64388   5.120421     2.08   0.038     .6080365    20.67972
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   23.95698   7.811005     3.07   0.002     8.647693    39.26627
         L2. |   13.20121   11.55311     1.14   0.253    -9.442464    35.84489
             |
```

```
      revtot |
         L1. |   1.368975   .2797833     4.89   0.000     .8206101    1.917341
         L2. |  -.7541171   .2745507    -2.75   0.006    -1.292227   -.2160076
             |
       _cons |  -104.9162   103.8308    -1.01   0.312    -308.4208    98.58847
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  3.219      2    0.200    |
  |               env                ALL |  3.219      2    0.200    |
  |--------------------------------------+---------------------------|
  |            revtot                env | 9.6977      2    0.008    |
  |            revtot                ALL | 9.6977      2    0.008    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -34.34363                         AIC             =  11.08591
FPE            =  344.7528                         HQIC            =  10.41616
Det(Sigma_ml)  =  18.35962                         SBIC            =  11.18521

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .93585   0.4618   6.865558   0.1432
cos                  5     13.5936   0.9609   196.3645   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5049514   .3775353    -1.34   0.181    -1.244907    .2350041
         L2. |  -.0140961   .5405201    -0.03   0.979    -1.073496    1.045304
             |
         cos |
         L1. |   .0131665   .0168803     0.78   0.435    -.0199182    .0462512
         L2. |  -.0208391   .0173068    -1.20   0.229    -.0547597    .0130816
             |
       _cons |   10.60297   4.973234     2.13   0.033     .8556065    20.35033
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   16.28762   5.483847     2.97   0.003      5.53948    27.03577
         L2. |   11.83581   7.851266     1.51   0.132    -3.552391    27.22401
             |
```

```
         cos |
         L1. |   1.617703   .2451923     6.60   0.000     1.137135    2.098271
         L2. |  -1.040963   .2513877    -4.14   0.000    -1.533674   -.5482521
             |
       _cons |  -85.93993   72.23817    -1.19   0.234    -227.5241    55.64428
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  3.5847     2    0.167    |
  |               env                ALL |  3.5847     2    0.167    |
  |--------------------------------------+---------------------------|
  |               cos                env |  8.8225     2    0.012    |
  |               cos                ALL |  8.8225     2    0.012    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.95983                         AIC             =  8.989958
FPE            =  42.38853                         HQIC            =  8.320206
Det(Sigma_ml)  =  2.257377                         SBIC            =   9.08926

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .737587   0.6657   15.93136   0.0031
ni                   5     6.45603   0.4976   7.924417   0.0944
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8081401   .3538738    -2.28   0.022     -1.50172   -.1145603
         L2. |  -.1766855   .4377915    -0.40   0.687    -1.034741    .6813701
             |
          ni |
         L1. |   .1238264   .0523167     2.37   0.018     .0212875    .2263653
         L2. |   -.116393   .0365255    -3.19   0.001    -.1879816   -.0448044
             |
       _cons |   11.98589   4.193724     2.86   0.004     3.766342    20.20544
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   4.417524   3.097421     1.43   0.154     -1.65331    10.48836
         L2. |   -1.33477   3.831945    -0.35   0.728    -8.845244    6.175704
             |
```

```
         ni |
        L1. |   .4155229    .457923     0.91   0.364    -.4819896    1.313035
        L2. |  -.1149322   .3197037    -0.36   0.719      -.74154    .5116755
            |
      _cons |  -12.09819   36.70724    -0.33   0.742    -84.04305    59.84667
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  10.65      2    0.005    |
  |               env                ALL |  10.65      2    0.005    |
  |--------------------------------------+---------------------------|
  |                ni                env | 4.9835      2    0.083    |
  |                ni                ALL | 4.9835      2    0.083    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -35.54652                         AIC             =  11.38663
FPE            =  465.7038                         HQIC            =  10.71688
Det(Sigma_ml)  =  24.80079                         SBIC            =  11.48593

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .848116   0.5580   10.1002   0.0388
curra                5     18.8931   0.7663   26.22644   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.6300338   .4207785    -1.50   0.134    -1.454744    .1946769
         L2. |   .2437132   .4103096     0.59   0.553    -.5604788    1.047905
             |
       curra |
         L1. |   .0056386     .01556     0.36   0.717    -.0248585    .0361357
         L2. |  -.0241602   .0157611    -1.53   0.125    -.0550514     .006731
             |
       _cons |   11.47047   4.757683     2.41   0.016     2.145583    20.79536
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   8.667505   9.373512     0.92   0.355    -9.704241    27.03925
         L2. |   7.356645     9.1403     0.80   0.421    -10.55801     25.2713
             |
```

```
       curra |
         L1. |   .9012671   .3466243     2.60   0.009      .221896    1.580638
         L2. |  -.3075632   .3511034    -0.88   0.381    -.9957133    .3805868
             |
       _cons |  -25.77465    105.985    -0.24   0.808    -233.5014    181.9521
------------------------------------------------------------------------------

. est store curraregg

. vargranger, estimates (curraregg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  6.1055     2    0.047    |
  |               env                ALL |  6.1055     2    0.047    |
  |--------------------------------------+---------------------------|
  |             curra                env |  .94255     2    0.624    |
  |             curra                ALL |  .94255     2    0.624    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.89839                         AIC             =   12.2246
FPE            =   1076.55                         HQIC            =  11.55484
Det(Sigma_ml)  =  57.33105                         SBIC            =   12.3239

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .668705   0.7252   21.11551   0.0003
asset                5     35.8495   0.8524   46.19492   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.082324   .4250036    -2.55   0.011    -1.915316   -.2493327
         L2. |  -.2027738   .4593427    -0.44   0.659    -1.103069    .6975213
             |
       asset |
         L1. |   .0113032   .0069096     1.64   0.102    -.0022393    .0248458
         L2. |   -.017435   .0057809    -3.02   0.003    -.0287653   -.0061047
             |
       _cons |   16.60174   4.691013     3.54   0.000     7.407527    25.79596
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   2.513295   22.78457     0.11   0.912    -42.14364    47.17023
         L2. |  -14.28646    24.6255    -0.58   0.562    -62.55155    33.97863
             |
```

```
       asset |
         L1. |   1.314611   .3704251     3.55   0.000     .5885909    2.040631
         L2. |  -.8516398   .3099135    -2.75   0.006    -1.459059   -.2442204
             |
       _cons |   313.8153   251.4866     1.25   0.212    -179.0894    806.7201
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  14.69      2    0.001    |
  |               env                ALL |  14.69      2    0.001    |
  |--------------------------------------+---------------------------|
  |             asset                env |  1.157      2    0.561    |
  |             asset                ALL |  1.157      2    0.561    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.88843                         AIC             =  10.22211
FPE            =  145.3331                         HQIC            =  9.552357
Det(Sigma_ml)  =  7.739633                         SBIC            =  10.32141

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .430792   0.8860   62.15503   0.0000
currl                5     17.4281   0.7891   29.92704   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8567292   .1953094    -4.39   0.000    -1.239529   -.4739298
         L2. |  -.1079009   .2209247    -0.49   0.625    -.5409054    .3251036
             |
       currl |
         L1. |   .0103892   .0080502     1.29   0.197    -.0053889    .0261673
         L2. |  -.0430083   .0088945    -4.84   0.000    -.0604412   -.0255753
             |
       _cons |   16.10825   2.498022     6.45   0.000     11.21222    21.00429
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   11.71663   7.901439     1.48   0.138    -3.769904    27.20317
         L2. |   20.56576    8.93773     2.30   0.021     3.048134    38.08339
             |
```

```
       currl |
         L1. |   .6752172   .3256792     2.07   0.038     .0368977    1.313537
         L2. |  -.4860219   .3598375    -1.35   0.177    -1.191291    .2192466
             |
       _cons |  -96.45992     101.06    -0.95   0.340    -294.5338     101.614
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  46.672     2    0.000    |
  |               env                ALL |  46.672     2    0.000    |
  |--------------------------------------+---------------------------|
  |             currl                env |  5.3142     2    0.070    |
  |             currl                ALL |  5.3142     2    0.070    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.82442                         AIC             =  10.20611
FPE            =  143.0259                         HQIC            =  9.536354
Det(Sigma_ml)  =  7.616766                         SBIC            =  10.30541

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .787501   0.6189   12.99383   0.0113
ltd                  5     11.4462   0.6740   16.53705   0.0024
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7317779   .4485983    -1.63   0.103    -1.611014    .1474587
         L2. |   .5248304   .4255419     1.23   0.217    -.3092165    1.358877
             |
         ltd |
         L1. |  -.0376522   .0170183    -2.21   0.027    -.0710074    -.004297
         L2. |  -.0242365    .022923    -1.06   0.290    -.0691648    .0206918
             |
       _cons |   12.41723   6.058712     2.05   0.040     .5423696    24.29208
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   16.22505   6.520328     2.49   0.013     3.445445    29.00466
         L2. |   15.69842   6.185205     2.54   0.011     3.575641     27.8212
             |
```

```
         ltd |
         L1. |  -.0888145   .2473589    -0.36   0.720     -.573629    .3959999
         L2. |   .1318232   .3331838     0.40   0.692    -.5212051    .7848515
             |
       _cons |  -118.2414   88.06271    -1.34   0.179    -290.8412    54.35829
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  8.3605     2    0.015    |
  |               env                ALL |  8.3605     2    0.015    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  7.7988     2    0.020    |
  |               ltd                ALL |  7.7988     2    0.020    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -33.79521                         AIC             =   10.9488
FPE            =  300.5826                         HQIC            =  10.27905
Det(Sigma_ml)  =  16.00736                         SBIC            =   11.0481

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .677166   0.7182   20.39251   0.0004
tl                   5     21.2213   0.8825   60.08934   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.9258496   .4660583    -1.99   0.047    -1.839307   -.0123921
         L2. |   .1649644   .4440271     0.37   0.710    -.7053127    1.035242
             |
          tl |
         L1. |   .0069395   .0102978     0.67   0.500    -.0132438    .0271228
         L2. |  -.0215358   .0088162    -2.44   0.015    -.0388153   -.0042564
             |
       _cons |   14.19964   4.987716     2.85   0.004     4.423901    23.97539
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   2.789463   14.60555     0.19   0.849     -25.8369    31.41582
         L2. |   13.70721   13.91513     0.99   0.325    -13.56594    40.98036
             |
```

```
          tl |
         L1. |   .9810496   .3227171     3.04   0.002     .3485357    1.613564
         L2. |  -.8461105   .2762863    -3.06   0.002    -1.387622   -.3045993
             |
       _cons |    104.075   156.3074     0.67   0.506    -202.2818    410.4318
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  14.126     2    0.001    |
  |               env                ALL |  14.126     2    0.001    |
  |--------------------------------------+---------------------------|
  |                tl                env |  1.8243     2    0.402    |
  |                tl                ALL |  1.8243     2    0.402    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.06553                         AIC             =  10.01638
FPE            =  118.3094                         HQIC            =  9.346632
Det(Sigma_ml)  =  6.300503                         SBIC            =  10.11569

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .54769   0.8157   35.40346   0.0000
oe                   5     12.3444   0.8855    61.8503   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.047062   .2753978    -3.80   0.000    -1.586831   -.5072918
         L2. |  -.7446414   .3760119    -1.98   0.048    -1.481611   -.0076717
             |
          oe |
         L1. |   .0582538   .0155113     3.76   0.000     .0278522    .0886554
         L2. |  -.0598053   .0125266    -4.77   0.000    -.0843569   -.0352537
             |
       _cons |   17.09503   3.178328     5.38   0.000     10.86562    23.32444
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   5.733739   6.207217     0.92   0.356    -6.432183    17.89966
         L2. |  -19.83773   8.474967    -2.34   0.019    -36.44836     -3.2271
             |
```

```
          oe |
         L1. |   1.461999   .3496109     4.18   0.000     .7767737    2.147223
         L2. |  -.6182007   .2823372    -2.19   0.029    -1.171571   -.0648299
             |
       _cons |   122.4972   71.63664     1.71   0.087    -17.90808    262.9024
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  25.824     2    0.000    |
  |               env                ALL |  25.824     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  18.993     2    0.000    |
  |                oe                ALL |  18.993     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 5.log
  log type:  text
 closed on:   2 Jul 2012, 17:03:45
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 6.log
  log type:  text
 opened on:   2 Jul 2012, 17:08:39

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -41.08504                         AIC             =  12.77126
FPE            =   1859.72                         HQIC            =  12.10151
Det(Sigma_ml)  =  99.03832                         SBIC            =  12.87056

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .754035   0.5401   9.39572   0.0519
revtot                5     74.7742   0.7312   21.7656   0.0002
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.4069225   .4726547    -0.86   0.389    -1.333309    .5194638
         L2. |  -.0889633   .2455779    -0.36   0.717    -.5702872    .3923606
             |
      revtot |
         L1. |   .0090663   .0051645     1.76   0.079    -.0010559    .0191885
         L2. |   .0120661   .0084579     1.43   0.154    -.0045111    .0286433
             |
       _cons |  -2.697325   7.573096    -0.36   0.722    -17.54032    12.14567
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -43.55772   46.87103    -0.93   0.353    -135.4232    48.30781
         L2. |   7.415082   24.35285     0.30   0.761    -40.31563    55.14579
             |
      revtot |
         L1. |   .3506981   .5121391     0.68   0.493    -.6530762    1.354472
         L2. |  -1.305773   .8387325    -1.56   0.120    -2.949659    .3381126
             |
       _cons |   2371.141   750.9896     3.16   0.002     899.2283    3843.053
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  8.3455     2    0.015    |
  |               env                ALL |  8.3455     2    0.015    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  1.1827     2    0.554    |
  |            revtot                ALL |  1.1827     2    0.554    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -39.53796                         AIC             =  12.38449
FPE            =  1263.208                         HQIC            =  11.71474
Det(Sigma_ml)  =  67.27141                         SBIC            =  12.48379

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .797184   0.4860   7.563523   0.1089
cos                  5     59.0407   0.7035   18.98554   0.0008
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.3889086   .4890457    -0.80   0.426    -1.347421    .5696033
         L2. |   -.122055   .2760713    -0.44   0.658    -.6631448    .4190347
             |
         cos |
         L1. |   .0091053   .0069845     1.30   0.192    -.0045841    .0227948
         L2. |   .0071993   .0098272     0.73   0.464    -.0120616    .0264602
             |
       _cons |   6.530936   6.536331     1.00   0.318    -6.280037    19.34191
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -33.52599   36.21949    -0.93   0.355    -104.5149    37.46291
         L2. |   15.62069   20.44627     0.76   0.445    -24.45327    55.69465
             |
         cos |
         L1. |   .7409444    .517285     1.43   0.152    -.2729155    1.754804
         L2. |  -.9101581   .7278156    -1.25   0.211    -2.336651    .5163344
             |
       _cons |   1070.441    484.091     2.21   0.027     121.6399    2019.242
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  6.6239     2    0.036    |
  |               env                ALL |  6.6239     2    0.036    |
  |--------------------------------------+---------------------------|
  |               cos                env |  2.2908     2    0.318    |
  |               cos                ALL |  2.2908     2    0.318    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.61815                         AIC             =  8.904538
FPE            =  38.91804                         HQIC            =  8.234786
Det(Sigma_ml)  =  2.072559                         SBIC            =   9.00384

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .466414   0.8240   37.46557   0.0000
ni                   5     13.0667   0.3594    4.48782   0.3440
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.7008921    .215436    -3.25   0.001    -1.123139   -.2786452
         L2. |   .0895665   .1447694     0.62   0.536    -.1941764    .3733093
             |
          ni |
         L1. |   .0257862   .0115619     2.23   0.026     .0031254    .0484471
         L2. |   .0642231   .0153244     4.19   0.000     .0341878    .0942585
             |
       _cons |   18.82402   3.025682     6.22   0.000     12.89379    24.75425
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -.4523307   6.035506    -0.07   0.940    -12.28171    11.37704
         L2. |   3.862042    4.05576     0.95   0.341    -4.087102    11.81119
             |
          ni |
         L1. |   .2291725   .3239093     0.71   0.479    -.4056781     .864023
         L2. |  -.4740504   .4293186    -1.10   0.270      -1.3155    .3673986
             |
       _cons |  -26.35017   84.76542    -0.31   0.756    -192.4873     139.787
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  34.721     2    0.000    |
  |               env                ALL |  34.721     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ni                env |  .90755     2    0.635    |
  |                ni                ALL |  .90755     2    0.635    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.65182                         AIC             =  12.16295
FPE            =  1012.193                         HQIC            =   11.4932
Det(Sigma_ml)  =  53.90378                         SBIC            =  12.26226

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .914223   0.3240   3.833723   0.4290
curra                5     39.4069   0.4745   7.223006   0.1246
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .1095282   .5594511     0.20   0.845    -.9869757    1.206032
         L2. |   .7160751   .4620496     1.55   0.121    -.1895255    1.621676
             |
       curra |
         L1. |   .0110805   .0121109     0.91   0.360    -.0126565    .0348175
         L2. |   .0138188    .010117     1.37   0.172    -.0060101    .0336477
             |
       _cons |  -7.872985   15.09977    -0.52   0.602    -37.46798    21.72201
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -18.98667    24.1147    -0.79   0.431    -66.25061    28.27727
         L2. |  -38.75172   19.91628    -1.95   0.052    -77.78692    .2834814
             |
       curra |
         L1. |  -.2044688   .5220324    -0.39   0.695    -1.227634     .818696
         L2. |  -.9476374   .4360842    -2.17   0.030    -1.802347   -.0929281
             |
       _cons |   1574.392   650.8636     2.42   0.016     298.7227    2850.061
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  3.1193     2    0.210    |
  |               env                ALL |  3.1193     2    0.210    |
  |--------------------------------------+---------------------------|
  |             curra                env |  3.8646     2    0.145    |
  |             curra                ALL |  3.8646     2    0.145    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -39.01842                         AIC             =  12.25461
FPE            =  1109.345                         HQIC            =  11.58485
Det(Sigma_ml)  =  59.07755                         SBIC            =  12.35391

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .908283   0.3327   3.988995   0.4075
asset                5     119.165   0.5801   11.05212   0.0260
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   -1.36045   .7844306    -1.73   0.083    -2.897906    .1770053
         L2. |  -.5759101   .4535682    -1.27   0.204    -1.464887    .3130672
             |
       asset |
         L1. |  -.0094305   .0067452    -1.40   0.162    -.0226508    .0037899
         L2. |   .0001554   .0057522     0.03   0.978    -.0111187    .0114296
             |
       _cons |   44.95261   17.90911     2.51   0.012     9.851396    80.05382
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   25.16936   102.9161     0.24   0.807    -176.5425    226.8812
         L2. |   33.10868   59.50745     0.56   0.578    -83.52378    149.7411
             |
       asset |
         L1. |   .9021728   .8849604     1.02   0.308    -.8323177    2.636663
         L2. |   .3981109   .7546853     0.53   0.598    -1.081045    1.877267
             |
       _cons |  -1060.929   2349.648    -0.45   0.652    -5666.154    3544.296
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  3.2652     2    0.195    |
  |               env                ALL |  3.2652     2    0.195    |
  |--------------------------------------+---------------------------|
  |             asset                env |  .33207     2    0.847    |
  |             asset                ALL |  .33207     2    0.847    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -37.46695                         AIC             =  11.86674
FPE            =  752.6931                         HQIC            =  11.19699
Det(Sigma_ml)  =  40.08425                         SBIC            =  11.96604

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .673722   0.6329   13.79037   0.0080
currl                5     60.5334   0.6661   15.95985   0.0031
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -1.139889   .3466342    -3.29   0.001    -1.819279   -.4604979
         L2. |  -.6780088   .3016185    -2.25   0.025     -1.26917   -.0868473
             |
       currl |
         L1. |  -.0115311   .0052416    -2.20   0.028    -.0218044   -.0012577
         L2. |  -.0158372   .0064055    -2.47   0.013    -.0283917   -.0032827
             |
       _cons |   46.34666   9.790698     4.73   0.000     27.15724    65.53607
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -11.92572   31.14485    -0.38   0.702    -72.96851    49.11707
         L2. |    5.16358   27.10022     0.19   0.849    -47.95188    58.27904
             |
       currl |
         L1. |   1.017797   .4709541     2.16   0.031     .0947439     1.94085
         L2. |   .0566641   .5755272     0.10   0.922    -1.071348    1.184677
             |
       _cons |   28.14513   879.6876     0.03   0.974    -1696.011    1752.301
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  12.475     2    0.002    |
  |               env                ALL |  12.475     2    0.002    |
  |--------------------------------------+---------------------------|
  |             currl                env |  .33884     2    0.844    |
  |             currl                ALL |  .33884     2    0.844    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -44.35083                         AIC             =  13.58771
FPE            =  4207.511                         HQIC            =  12.91795
Det(Sigma_ml)  =  224.0686                         SBIC            =  13.68701

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .966436   0.2445   2.589598   0.6287
ltd                  5     41.3048   0.6148   12.76934   0.0125
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.4344054   .3397624    -1.28   0.201    -1.100327    .2315167
         L2. |  -.2182111   .3668761    -0.59   0.552     -.937275    .5008528
             |
         ltd |
         L1. |  -.0071694    .009517    -0.75   0.451    -.0258223    .0114835
         L2. |  -.0006662   .0085264    -0.08   0.938    -.0173775    .0160452
             |
       _cons |   22.65059    7.97436     2.84   0.005     7.021127    38.28004
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   16.85769   14.52121     1.16   0.246    -11.60336    45.31874
         L2. |  -.2944968   15.68003    -0.02   0.985    -31.02679     30.4378
             |
         ltd |
         L1. |   .6773543   .4067483     1.67   0.096    -.1198577    1.474566
         L2. |    .019421   .3644104     0.05   0.957    -.6948102    .7336522
             |
       _cons |  -120.8957   340.8186    -0.35   0.723     -788.888    547.0965
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  1.9502     2    0.377    |
  |               env                ALL |  1.9502     2    0.377    |
  |--------------------------------------+---------------------------|
  |               ltd                env |   1.467     2    0.480    |
  |               ltd                ALL |   1.467     2    0.480    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -40.78208                         AIC             =  12.69552
FPE            =  1724.067                         HQIC            =  12.02577
Det(Sigma_ml)  =  91.81421                         SBIC            =  12.79482

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .765296   0.5263   8.887534   0.0640
oe                   5     57.5566   0.4799   7.380633   0.1171
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.9476638   .6330635    -1.50   0.134    -2.188445    .2931179
         L2. |  -.1710577   .2670378    -0.64   0.522    -.6944421    .3523268
             |
          oe |
         L1. |  -.0017706   .0073111    -0.24   0.809    -.0161001     .012559
         L2. |   .0183135   .0091815     1.99   0.046      .000318     .036309
             |
       _cons |   22.89489    9.25903     2.47   0.013      4.74752    41.04225
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   78.55291   47.61159     1.65   0.099    -14.76408    171.8699
         L2. |    30.2772   20.08344     1.51   0.132    -9.085617    69.64003
             |
          oe |
         L1. |   1.097242   .5498574     2.00   0.046     .0195417    2.174943
         L2. |  -1.601042   .6905271    -2.32   0.020    -2.954451   -.2476342
             |
       _cons |  -1049.634   696.3553    -1.51   0.132    -2414.465    315.1976
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  7.8679     2    0.020    |
  |               env                ALL |  7.8679     2    0.020    |
  |--------------------------------------+---------------------------|
  |                oe                env |  3.4912     2    0.175    |
  |                oe                ALL |  3.4912     2    0.175    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 6.log
  log type:  text
 closed on:   2 Jul 2012, 17:11:52
________________________________________________________________________________


--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 7.log
  log type:  text
 opened on:   2 Jul 2012, 17:12:04

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression
```

```
Sample:  2003 - 2010                                   No. of obs      =         8
Log likelihood = -45.15243                             AIC             =  13.78811
FPE            =  5141.128                             HQIC            =  13.11836
Det(Sigma_ml)  =  273.7879                             SBIC            =  13.88741

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .996656   0.6875   17.60024   0.0015
revtot               5     56.5168   0.6960   18.31156   0.0011
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5318875   .3760335    -1.41   0.157      -1.2689    .2051245
         L2. |   .1275545   .1061667     1.20   0.230    -.0805284    .3356374
             |
      revtot |
         L1. |   .0135258   .0079656     1.70   0.090    -.0020865     .029138
         L2. |  -.0220725   .0059693    -3.70   0.000    -.0337721    -.010373
             |
       _cons |   22.52615   3.957437     5.69   0.000     14.76971    30.28258
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -24.82549   21.32352    -1.16   0.244    -66.61882    16.96784
         L2. |   3.118618   6.020335     0.52   0.604    -8.681022    14.91826
             |
      revtot |
         L1. |    1.24925   .4516991     2.77   0.006     .3639362    2.134564
         L2. |  -.9634309   .3384963    -2.85   0.004    -1.626871   -.2999904
             |
       _cons |   670.9611   224.4122     2.99   0.003     231.1213    1110.801
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  15.293     2    0.000    |
  |               env                ALL |  15.293     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  1.3562     2    0.508    |
  |            revtot                ALL |  1.3562     2    0.508    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression
```

```
Sample:  2003 - 2010                                 No. of obs      =         8
Log likelihood = -41.01712                           AIC             =  12.75428
FPE            =  1828.404                           HQIC            =  12.08453
Det(Sigma_ml)  =  97.37064                           SBIC            =  12.85358

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .934069   0.7255   21.14588   0.0003
cos                  5     32.0196   0.7923   30.51763   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5429227   .3379785    -1.61   0.108    -1.205348     .119503
         L2. |   .1128132   .0997554     1.13   0.258    -.0827038    .3083302
             |
         cos |
         L1. |   .0215223   .0115581     1.86   0.063    -.0011311    .0441757
         L2. |  -.0354166   .0090148    -3.93   0.000    -.0530853   -.0177479
             |
       _cons |   23.39629   3.798944     6.16   0.000     15.95049    30.84208
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -14.14197   11.58581    -1.22   0.222    -36.84974    8.565787
         L2. |   .2067527   3.419587     0.06   0.952    -6.495515    6.909021
             |
         cos |
         L1. |   1.426799   .3962077     3.60   0.000     .6502463    2.203352
         L2. |   -1.08948   .3090255    -3.53   0.000    -1.695159    -.483801
             |
       _cons |   428.5199   130.2267     3.29   0.001     173.2803    683.7596
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  18.52      2    0.000    |
  |               env                ALL |  18.52      2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env | 1.6577      2    0.437    |
  |               cos                ALL | 1.6577      2    0.437    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression
```

```
Sample:  2003 - 2010                            No. of obs      =          8
Log likelihood = -41.03198                      AIC             =   12.75799
FPE            =  1835.211                      HQIC            =   12.08824
Det(Sigma_ml)  =  97.73312                      SBIC            =    12.8573

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.05458   0.6501   14.86528   0.0050
asset                5       25.213   0.6932   18.07223   0.0012
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2799696   .2979376    -0.94   0.347    -.8639165    .3039773
         L2. |   .0406897   .1074073     0.38   0.705    -.1698247     .251204
             |
       asset |
         L1. |   .0139657   .0112106     1.25   0.213    -.0080067    .0359381
         L2. |  -.0409591   .0119681    -3.42   0.001    -.0644161   -.0175021
             |
       _cons |   27.25758   5.639582     4.83   0.000      16.2042    38.31096
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -17.47867   7.123139    -2.45   0.014    -31.43977   -3.517572
         L2. |   6.768585    2.56791     2.64   0.008     1.735573     11.8016
             |
       asset |
         L1. |    .793412   .2680256     2.96   0.003     .2680915    1.318732
         L2. |   -.877827   .2861344    -3.07   0.002     -1.43864    -.317014
             |
       _cons |    605.305    134.832     4.49   0.000     341.0391     869.571
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  12.805     2    0.002    |
  |               env                ALL |  12.805     2    0.002    |
  |--------------------------------------+---------------------------|
  |             asset                env |  8.3928     2    0.015    |
  |             asset                ALL |  8.3928     2    0.015    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression
```

```
Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -39.99224                        AIC             =  12.49806
FPE            =  1415.134                        HQIC            =  11.82831
Det(Sigma_ml)  =  75.36217                        SBIC            =  12.59736

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.43389   0.3532   4.368035   0.3585
currl                5     25.2453   0.6037   12.18554   0.0160
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3522698   .6526519    -0.54   0.589    -1.631444    .9269044
         L2. |   .3809594   .6491378     0.59   0.557    -.8913274    1.653246
             |
       currl |
         L1. |   .0408783   .0507965     0.80   0.421     -.058681    .1404375
         L2. |   .0044641   .1535831     0.03   0.977    -.2965532    .3054815
             |
       _cons |   5.421006   31.60961     0.17   0.864    -56.53268     67.3747
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -17.84539   11.49067    -1.55   0.120    -40.36668    4.675905
         L2. |  -5.371351    11.4288    -0.47   0.638    -27.77138    17.02868
             |
       currl |
         L1. |   1.817087   .8943285     2.03   0.042      .064235    3.569938
         L2. |  -2.450105   2.704002    -0.91   0.365    -7.749852    2.849642
             |
       _cons |   557.4974   556.5224     1.00   0.316    -533.2666    1648.261
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  3.2535     2    0.197    |
  |               env                ALL |  3.2535     2    0.197    |
  |--------------------------------------+---------------------------|
  |             currl                env |  2.4658     2    0.291    |
  |             currl                ALL |  2.4658     2    0.291    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression
```

```
Sample:  2003 - 2010                                 No. of obs      =         8
Log likelihood = -23.79441                           AIC             =  8.448603
FPE            =  24.66841                           HQIC            =  7.778852
Det(Sigma_ml)  =  1.313702                           SBIC            =  8.547905

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.13198   0.5969   11.8453   0.0185
ltd                  5     5.60858   0.7095   19.54136  0.0006
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1900832   .2806266    -0.68   0.498    -.7401011    .3599348
         L2. |   .6960618   .3163913     2.20   0.028     .0759463    1.316177
             |
         ltd |
         L1. |   .2354112   .0747568     3.15   0.002     .0888906    .3819318
         L2. |   .0000304   .0586266     0.00   1.000    -.1148756    .1149364
             |
       _cons |   1.513062   4.589365     0.33   0.742    -7.481927    10.50805
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -.7550626   1.390412    -0.54   0.587    -3.480219    1.970094
         L2. |  -.1146934   1.567614    -0.07   0.942     -3.18716    2.957773
             |
         ltd |
         L1. |   .2049809   .3703951     0.55   0.580    -.5209801     .930942
         L2. |   .3020337   .2904754     1.04   0.298    -.2672876     .871355
             |
       _cons |    17.3874   22.73878     0.76   0.444    -27.17979    61.95459
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  10.057     2    0.007    |
  |               env                ALL |  10.057     2    0.007    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  .60275     2    0.740    |
  |               ltd                ALL |  .60275     2    0.740    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression
```

```
Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.44169                         AIC             =  12.11042
FPE            =  960.3932                         HQIC            =  11.44067
Det(Sigma_ml)  =   51.1452                         SBIC            =  12.20972

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.05717   0.6484   14.75317   0.0052
tl                   5     19.7055   0.8839   60.88944   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3679441   .3096847    -1.19   0.235     -.974915    .2390268
         L2. |   1.038694   .4087142     2.54   0.011     .2376292     1.83976
             |
          tl |
         L1. |   .0187657    .021858     0.86   0.391    -.0240753    .0616066
         L2. |   .0562472   .0446704     1.26   0.208    -.0313051    .1437995
             |
       _cons |  -11.63642    11.6414    -1.00   0.318    -34.45314     11.1803
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -10.84569   5.772461    -1.88   0.060    -22.15951    .4681243
         L2. |   22.04349   7.618351     2.89   0.004     7.111795    36.97518
             |
          tl |
         L1. |    .367548   .4074293     0.90   0.367    -.4309988    1.166095
         L2. |   1.963432   .8326467     2.36   0.018      .331474    3.595389
             |
       _cons |  -451.3781   216.9933    -2.08   0.038    -876.6773   -26.07898
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  12.703     2    0.002    |
  |               env                ALL |  12.703     2    0.002    |
  |--------------------------------------+---------------------------|
  |                tl                env |  9.8264     2    0.007    |
  |                tl                ALL |  9.8264     2    0.007    |
  +------------------------------------------------------------------+

. v
unrecognized command:  v
r(199);

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env ni

Vector autoregression

Sample:  2003 - 2010                           No. of obs      =         8
Log likelihood = -32.26885                     AIC             =  10.56721
FPE            =  205.2302                     HQIC            =  9.897461
Det(Sigma_ml)  =  10.92942                     SBIC            =  10.66651

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.06125   0.6457   14.57867   0.0057
ni                   5     11.8498   0.5315   9.077369   0.0592
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7368761   .4700626    -1.57   0.117    -1.658182    .1844296
         L2. |   .3103175   .1381523     2.25   0.025      .039544    .5810909
             |
          ni |
         L1. |   .0975752    .048758     2.00   0.045     .0020113    .1931391
         L2. |  -.1226814   .0348644    -3.52   0.000    -.1910143   -.0543486
             |
       _cons |    18.5934   4.645505     4.00   0.000     9.488375    27.69842
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -7.750773   5.248643    -1.48   0.140    -18.03792    2.536379
         L2. |   4.125511   1.542586     2.67   0.007     1.102098    7.148924
             |
          ni |
         L1. |   .7599612   .5444237     1.40   0.163    -.3070895    1.827012
         L2. |  -.7458374   .3892898    -1.92   0.055    -1.508831    .0171566
             |
       _cons |   69.78451   51.87096     1.35   0.179    -31.88071    171.4497
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  12.544     2    0.002    |
  |               env                ALL |  12.544     2    0.002    |
  |--------------------------------------+---------------------------|
  |                ni                env |   7.159     2    0.028    |
  |                ni                ALL |   7.159     2    0.028    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env curra

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -39.23926                        AIC             =  12.30982
FPE            =  1172.315                        HQIC            =  11.64006
Det(Sigma_ml)  =  62.43097                        SBIC            =  12.40912

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .978451   0.6988   18.56174   0.0010
curra                5     25.4874   0.5134   8.441728   0.0767
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3677824   .3224428    -1.14   0.254    -.9997586    .2641938
         L2. |   .1050459   .1021075     1.03   0.304     -.095081    .3051729
             |
       curra |
         L1. |   .0146006   .0154804     0.94   0.346    -.0157405    .0449417
         L2. |  -.0523382   .0144675    -3.62   0.000     -.080694   -.0239824
             |
       _cons |   24.77645   4.353121     5.69   0.000     16.24449    33.30841
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -12.70795   8.399206    -1.51   0.130    -29.17009    3.754196
         L2. |   7.491064   2.659764     2.82   0.005     2.278023     12.7041
             |
       curra |
         L1. |   .3014766   .4032447     0.75   0.455    -.4888684    1.091822
         L2. |  -.2786705   .3768596    -0.74   0.460    -1.017302    .4599607
             |
       _cons |   301.5355    113.393     2.66   0.008     79.28928    523.7817
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  16.168     2    0.000    |
  |               env                ALL |  16.168     2    0.000    |
  |--------------------------------------+---------------------------|
  |             curra                env |  7.9331     2    0.019    |
  |             curra                ALL |  7.9331     2    0.019    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env asset

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood = -41.03198                      AIC             =  12.75799
FPE            =  1835.211                      HQIC            =  12.08824
Det(Sigma_ml)  =  97.73312                      SBIC            =   12.8573

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.05458   0.6501   14.86528   0.0050
asset                5      25.213   0.6932   18.07223   0.0012
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2799696   .2979376    -0.94   0.347    -.8639165    .3039773
         L2. |   .0406897   .1074073     0.38   0.705    -.1698247     .251204
             |
       asset |
         L1. |   .0139657   .0112106     1.25   0.213    -.0080067    .0359381
         L2. |  -.0409591   .0119681    -3.42   0.001    -.0644161   -.0175021
             |
       _cons |   27.25758   5.639582     4.83   0.000      16.2042    38.31096
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -17.47867   7.123139    -2.45   0.014    -31.43977   -3.517572
         L2. |   6.768585    2.56791     2.64   0.008     1.735573     11.8016
             |
       asset |
         L1. |    .793412   .2680256     2.96   0.003     .2680915    1.318732
         L2. |   -.877827   .2861344    -3.07   0.002     -1.43864    -.317014
             |
       _cons |    605.305    134.832     4.49   0.000     341.0391     869.571
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  12.805     2    0.002    |
  |               env                ALL |  12.805     2    0.002    |
  |--------------------------------------+---------------------------|
  |             asset                env |  8.3928     2    0.015    |
  |             asset                ALL |  8.3928     2    0.015    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env oe

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood = -33.65729                      AIC             =  10.91432
FPE            =  290.3949                      HQIC            =  10.24457
Det(Sigma_ml)  =  15.46482                      SBIC            =  11.01362

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.07515   0.6363   13.99865   0.0073
oe                   5     10.5897   0.9774   345.4308   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2194373   .2810155    -0.78   0.435    -.7702175     .331343
         L2. |   .3278335   .1513022     2.17   0.030     .0312866    .6243803
             |
          oe |
         L1. |   .0177121   .0214026     0.83   0.408    -.0242361    .0596603
         L2. |  -.0395153   .0199987    -1.98   0.048    -.0787121   -.0003185
             |
       _cons |   15.64173   2.938256     5.32   0.000     9.882855    21.40061
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -6.017266   2.767868    -2.17   0.030    -11.44219   -.5923455
         L2. |   7.185306   1.490254     4.82   0.000     4.264463    10.10615
             |
          oe |
         L1. |   1.060171   .2108049     5.03   0.000     .6470011    1.473341
         L2. |  -.4196828   .1969778    -2.13   0.033    -.8057522   -.0336134
             |
       _cons |   78.89083   28.94041     2.73   0.006     22.16867     135.613
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  12.016     2    0.002    |
  |               env                ALL |  12.016     2    0.002    |
  |--------------------------------------+---------------------------|
  |                oe                env |  23.574     2    0.000    |
  |                oe                ALL |  23.574     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/firm 7.log
  log type:  text
```

```
 closed on:   2 Jul 2012, 17:16:31
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/Firm
8.log
  log type:  text
 opened on:   2 Jul 2012, 17:17:20

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -15.91483                         AIC             =  6.478707
FPE            =  3.440533                         HQIC            =  5.808955
Det(Sigma_ml)  =  .1832237                         SBIC            =  6.578008

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .448585   0.1352   1.250879   0.8697
revtot               5     2.87808   0.6279   13.50087   0.0091
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.259821   .3324911    -0.78   0.435    -.9114917    .3918496
         L2. |  -.0962831   .3051905    -0.32   0.752    -.6944454    .5018792
             |
      revtot |
         L1. |  -.0186389   .0387218    -0.48   0.630    -.0945322    .0572544
         L2. |  -.0697247   .0742446    -0.94   0.348    -.2152414    .0757919
             |
       _cons |   4.853792   4.449277     1.09   0.275     -3.86663    13.57421
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   1.071406   2.133231     0.50   0.615     -3.10965    5.252462
         L2. |   2.615863   1.958073     1.34   0.182    -1.221888    6.453615
             |
      revtot |
         L1. |  -.5781281   .2484352    -2.33   0.020    -1.065052    -.091204
         L2. |  -1.348511   .4763459    -2.83   0.005    -2.282132   -.4148903
             |
       _cons |   125.9449   28.54613     4.41   0.000      69.9955    181.8943
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)
```

```
  Granger causality Wald tests
 +------------------------------------------------------------------+
 |          Equation           Excluded |   chi2     df Prob > chi2 |
 |--------------------------------------+---------------------------|
 |               env             revtot |  .88349     2    0.643    |
 |               env                ALL |  .88349     2    0.643    |
 |--------------------------------------+---------------------------|
 |            revtot                env |  1.9733     2    0.373    |
 |            revtot                ALL |  1.9733     2    0.373    |
 +------------------------------------------------------------------+

.
. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -9.748892                         AIC             =  4.937223
FPE            =  .7364919                         HQIC            =  4.267471
Det(Sigma_ml)  =  .0392215                         SBIC            =  5.036525

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .472434   0.0408   .340448   0.9871
cos                  5     1.13034   0.9210   93.20879  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.187491   .3372949    -0.56   0.578    -.8485769    .4735949
         L2. |  -.0522615   .3320062    -0.16   0.875    -.7029818    .5984587
             |
         cos |
         L1. |  -.0031079   .0507896    -0.06   0.951    -.1026536    .0964379
         L2. |  -.0075328   .0796758    -0.09   0.925    -.1636945    .1486289
             |
       _cons |   1.220467   3.765622     0.32   0.746    -6.160016     8.60095
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   1.919644   .8070103     2.38   0.017     .3379331    3.501355
         L2. |   4.650295   .7943566     5.85   0.000     3.093385    6.207206
             |
         cos |
         L1. |  -.6602881   .1215189    -5.43   0.000    -.8984607   -.4221155
         L2. |  -1.550824   .1906319    -8.14   0.000    -1.924456   -1.177193
             |
       _cons |   102.0883   9.009609    11.33   0.000     84.42981    119.7468
------------------------------------------------------------------------------

. est store cosreg
```

```
. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  .00921     2    0.995    |
  |               env                ALL |  .00921     2    0.995    |
  |--------------------------------------+---------------------------|
  |               cos                env |  39.704     2    0.000    |
  |               cos                ALL |  39.704     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -1.290693                         AIC             =  2.822673
FPE            =  .0888855                         HQIC            =  2.152922
Det(Sigma_ml)  =  .0047335                         SBIC            =  2.921975

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .438107   0.1751   1.698668   0.7910
ni                   5     .882188   0.4731   7.182416   0.1266
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1472883   .3880254    -0.38   0.704    -.9078041    .6132274
         L2. |  -.4347709   .4406874    -0.99   0.324    -1.298502    .4289606
             |
          ni |
         L1. |   .0651116   .1671001     0.39   0.697    -.2623986    .3926218
         L2. |  -.2652529   .2344147    -1.13   0.258    -.7246973    .1941914
             |
       _cons |   1.189628   .4332586     2.75   0.006     .3404571      2.0388
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   1.051522   .7813421     1.35   0.178    -.4798803    2.582925
         L2. |  -1.698871   .8873844    -1.91   0.056    -3.438113    .0403706
             |
          ni |
         L1. |    .433774   .3364789     1.29   0.197    -.2257126    1.093261
         L2. |  -.2936973    .472026    -0.62   0.534    -1.218851    .6314567
             |
       _cons |   .5060595   .8724255     0.58   0.562    -1.203863    2.215982
------------------------------------------------------------------------------

. est store nireg
```

```
. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  1.3135     2    0.519    |
  |               env                ALL |  1.3135     2    0.519    |
  |--------------------------------------+---------------------------|
  |                ni                env |  4.9883     2    0.083    |
  |                ni                ALL |  4.9883     2    0.083    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -3.615051                         AIC             =  3.403763
FPE            =  .1589259                         HQIC            =  2.734011
Det(Sigma_ml)  =  .0084635                         SBIC            =  3.503065

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .40629   0.2906   3.277165   0.5126
curra                5     1.11502   0.6594   15.48847   0.0038
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2201183   .3211409    -0.69   0.493    -.8495429    .4093063
         L2. |   -.342858   .4118335    -0.83   0.405    -1.150037    .4643209
             |
       curra |
         L1. |   .0208371   .0968119     0.22   0.830    -.1689107     .210585
         L2. |   .1272075   .0762536     1.67   0.095    -.0222469    .2766618
             |
       _cons |   -3.40644   3.465741    -0.98   0.326    -10.19917    3.386288
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   3.201408   .8813373     3.63   0.000     1.474019    4.928797
         L2. |   2.693515   1.130234     2.38   0.017     .4782982    4.908732
             |
       curra |
         L1. |  -.5531377   .2656901    -2.08   0.037    -1.073881   -.0323947
         L2. |  -.2720563     .20927    -1.30   0.194    -.6822179    .1381054
             |
       _cons |   51.66284   9.511361     5.43   0.000     33.02092    70.30477
------------------------------------------------------------------------------

. est store currareg
```

```
. vargranger, estimates (curareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.8293     2    0.243    |
  |               env                ALL |  2.8293     2    0.243    |
  |--------------------------------------+---------------------------|
  |             curra                env |  14.654     2    0.001    |
  |             curra                ALL |  14.654     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -9.402848                         AIC             =  4.850712
FPE            =  .6754554                         HQIC            =   4.18096
Det(Sigma_ml)  =   .035971                         SBIC            =  4.950014

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .418847   0.2461   2.611097   0.6249
asset                5     1.48615   0.7455   23.43806   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3796218   .5342492    -0.71   0.477    -1.426731    .6674875
         L2. |  -.4474143   .6991661    -0.64   0.522    -1.817755     .922926
             |
       asset |
         L1. |    .035183   .1569577     0.22   0.823    -.2724484    .3428143
         L2. |   .0534927   .0727082     0.74   0.462    -.0890127    .1959981
             |
       _cons |  -2.572001   4.100039    -0.63   0.530    -10.60793    5.463929
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   3.902345   1.895618     2.06   0.040     .1870019    7.617687
         L2. |   .5196824   2.480774     0.21   0.834    -4.342545     5.38191
             |
       asset |
         L1. |   .0125475   .5569156     0.02   0.982    -1.078987    1.104082
         L2. |   .3044606   .2579824     1.18   0.238    -.2011757    .8100968
             |
       _cons |   27.66495   14.54772     1.90   0.057    -.8480542    56.17795
------------------------------------------------------------------------------

. est store assetreg
```

```
. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  2.1897     2    0.335    |
  |               env                ALL |  2.1897     2    0.335    |
  |--------------------------------------+---------------------------|
  |             asset                env |  8.9376     2    0.011    |
  |             asset                ALL |  8.9376     2    0.011    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -9.291907                         AIC             =  4.822977
FPE            =   .656979                         HQIC            =  4.153225
Det(Sigma_ml)  =   .034987                         SBIC            =  4.922279

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .217216   0.7972   31.4539   0.0000
currl                5     2.38274   0.2838   3.169952   0.5298
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2644434   .1709795    -1.55   0.122    -.5995571    .0706704
         L2. |  -.5272167    .172081    -3.06   0.002    -.8644893    -.189944
             |
       currl |
         L1. |  -.0194622   .0298431    -0.65   0.514    -.0779536    .0390292
         L2. |   .1484233   .0272437     5.45   0.000     .0950265      .20182
             |
       _cons |  -1.409389   .6618946    -2.13   0.033    -2.706679   -.1120994
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |    .919678   1.875552     0.49   0.624    -2.756336    4.595692
         L2. |   .6116637   1.887635     0.32   0.746    -3.088032     4.31136
             |
       currl |
         L1. |  -.2636125   .3273625    -0.81   0.421    -.9052312    .3780062
         L2. |   .4039087   .2988489     1.35   0.177    -.1818243    .9896417
             |
       _cons |   17.79746   7.260621     2.45   0.014     3.566903    32.02802
------------------------------------------------------------------------------

. est store currlreg
```

```
. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  29.887     2    0.000    |
  |               env                ALL |  29.887     2    0.000    |
  |--------------------------------------+---------------------------|
  |             currl                env |  .29655     2    0.862    |
  |             currl                ALL |  .29655     2    0.862    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -9.704617                         AIC             =  4.926154
FPE            =  .7283848                         HQIC            =  4.256403
Det(Sigma_ml)  =  .0387897                         SBIC            =  5.025456

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .304235   0.6022   12.11192   0.0165
ltd                  5     2.07001   0.5130    8.42824   0.0771
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3506982   .2206083    -1.59   0.112    -.7830825    .0816862
         L2. |  -.3624218      .2358    -1.54   0.124    -.8245813    .0997377
             |
         ltd |
         L1. |   .0650817   .0498381     1.31   0.192    -.0325991    .1627626
         L2. |  -.2302821   .0698007    -3.30   0.001    -.3670889   -.0934753
             |
       _cons |   1.567244   .2979781     5.26   0.000     .9832174     2.15127
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   2.525118   1.501013     1.68   0.093    -.4168135    5.467049
         L2. |   1.243451   1.604377     0.78   0.438     -1.90107    4.387972
             |
         ltd |
         L1. |   .4409333   .3390971     1.30   0.193    -.2236848    1.105551
         L2. |   .3727319    .474922     0.78   0.433    -.5580981    1.303562
             |
       _cons |  -1.538903   2.027435    -0.76   0.448    -5.512602    2.434796
------------------------------------------------------------------------------

. est store ltdreg
```

```
. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  11.313     2    0.003    |
  |               env                ALL |  11.313     2    0.003    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  3.1235     2    0.210    |
  |               ltd                ALL |  3.1235     2    0.210    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -6.618336                         AIC             =  4.154584
FPE            =  .3367225                         HQIC            =  3.484832
Det(Sigma_ml)  =   .017932                         SBIC            =  4.253886

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .27062   0.6853   17.41864   0.0016
tl                   5     1.32676   0.8846   61.30101   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6134114   .2954819     2.08   0.038     .0342775    1.192545
         L2. |  -.0244771   .2216436    -0.11   0.912    -.4588906    .4099365
             |
          tl |
         L1. |  -.2470941      .0697    -3.55   0.000    -.3837036   -.1104847
         L2. |   .2611658   .0646771     4.04   0.000      .134401    .3879306
             |
       _cons |   .0975641   .9522397     0.10   0.918    -1.768791     1.96392
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   3.652069   1.448648     2.52   0.012     .8127717    6.491367
         L2. |   .1485285   1.086644     0.14   0.891    -1.981254    2.278311
             |
          tl |
         L1. |  -.1866626   .3417153    -0.55   0.585    -.8564124    .4830871
         L2. |    1.22264     .31709     3.86   0.000     .6011553    1.844125
             |
       _cons |  -1.651724   4.668509    -0.35   0.723    -10.80183    7.498385
------------------------------------------------------------------------------

. est store tlreg
```

```
. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  16.409     2    0.000    |
  |               env                ALL |  16.409     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  6.6877     2    0.035    |
  |                tl                ALL |  6.6877     2    0.035    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -6.546862                         AIC             =  4.136716
FPE            =  .3307593                         HQIC            =  3.466964
Det(Sigma_ml)  =  .0176144                         SBIC            =  4.236018

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5      .41093   0.2743   3.023909   0.5538
oe                    5     1.09459   0.7767   27.82744   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3148708   .3267127    -0.96   0.335     -.955216    .3254744
         L2. |   -.314745   .3171251    -0.99   0.321    -.9362987    .3068087
             |
          oe |
         L1. |   .1025229   .0815837     1.26   0.209    -.0573782     .262424
         L2. |   .0836751   .1042069     0.80   0.422    -.1205666    .2879168
             |
       _cons |  -1.825376   1.793164    -1.02   0.309    -5.339912     1.68916
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   1.808927   .8702569     2.08   0.038     .1032545    3.514599
         L2. |  -3.099961   .8447185    -3.67   0.000    -4.755579   -1.444343
             |
          oe |
         L1. |   .9568214   .2173125     4.40   0.000     .5308967    1.382746
         L2. |  -.3922602   .2775733    -1.41   0.158     -.936294    .1517735
             |
       _cons |   7.465488   4.776407     1.56   0.118    -1.896097    16.82707
------------------------------------------------------------------------------

. est store oereg
```

```
. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  2.5861     2    0.274    |
  |               env                ALL |  2.5861     2    0.274    |
  |--------------------------------------+---------------------------|
  |                oe                env |   20.02     2    0.000    |
  |                oe                ALL |   20.02     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/Firm
8.log
  log type:  text
 closed on:   2 Jul 2012, 17:20:18
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
9.log
  log type:  text
 opened on:   2 Jul 2012, 17:20:31

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -16.95715                         AIC             =  6.739286
FPE            =   4.46472                         HQIC            =  6.069535
Det(Sigma_ml)  =  .2377661                         SBIC            =  6.838588

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5      .42259   0.4539   6.648054   0.1557
revtot                5     18.7487   0.7749   27.53992   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0807498   .2034432    -0.40   0.691    -.4794911    .3179915
         L2. |   .1393271   .1724204     0.81   0.419    -.1986107    .4772649
             |
      revtot |
         L1. |   .0094309   .0094503     1.00   0.318    -.0090914    .0279532
         L2. |  -.0170994   .0081183    -2.11   0.035     -.033011   -.0011878
             |
       _cons |   6.075932   .8679986     7.00   0.000     4.374686    7.777178
```

```
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   2.811719   9.025973     0.31   0.755    -14.87886     20.5023
         L2. |   10.19234   7.649615     1.33   0.183    -4.800634    25.18531
             |
      revtot |
         L1. |   .6989649   .4192738     1.67   0.095    -.1227965    1.520726
         L2. |  -.3059765   .3601767    -0.85   0.396     -1.01191    .3999569
             |
       _cons |   71.49416   38.50968     1.86   0.063    -3.983428    146.9717
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  5.8008     2    0.055    |
  |               env                ALL |  5.8008     2    0.055    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  2.2089     2    0.331    |
  |            revtot                ALL |  2.2089     2    0.331    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -9.706047                         AIC             =  4.926512
FPE            =  .7286453                         HQIC            =   4.25676
Det(Sigma_ml)  =  .0388036                         SBIC            =  5.025814

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .427535   0.4410   6.311185   0.1771
cos                  5     11.6928   0.8622   50.06538   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0730716   .2032592    -0.36   0.719    -.4714524    .3253092
         L2. |   .0997379   .1738971     0.57   0.566    -.2410942    .4405699
             |
         cos |
         L1. |   .0152519   .0150899     1.01   0.312    -.0143238    .0448275
         L2. |  -.0252184   .0133546    -1.89   0.059     -.051393    .0009562
             |
       _cons |   5.987774   .8546961     7.01   0.000     4.312601    7.662948
```

```
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   1.633585   5.558998     0.29   0.769     -9.26185    12.52902
         L2. |   5.286038   4.755964     1.11   0.266    -4.035481    14.60756
             |
         cos |
         L1. |   1.087899   .4126977     2.64   0.008     .2790269    1.896772
         L2. |  -.6083238   .3652402    -1.67   0.096    -1.324181    .1075338
             |
       _cons |   42.76559   23.37534     1.83   0.067    -3.049231    88.58042
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  5.4835     2    0.064    |
  |               env                ALL |  5.4835     2    0.064    |
  |--------------------------------------+---------------------------|
  |               cos                env |   1.467     2    0.480    |
  |               cos                ALL |   1.467     2    0.480    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -5.479684                         AIC             =  3.869921
FPE            =  .2533055                         HQIC            =  3.200169
Det(Sigma_ml)  =  .0134896                         SBIC            =  3.969223

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .401143   0.5079   8.256262   0.0826
ni                   5     1.95791   0.7992   31.84377   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4238048   .2490096    -1.70   0.089    -.9118547    .0642451
         L2. |  -.5763133   .2763142    -2.09   0.037    -1.117879   -.0347474
             |
          ni |
         L1. |   .3038017   .1136595     2.67   0.008     .0810331    .5265703
         L2. |  -.1017765   .0519196    -1.96   0.050    -.2035371    -.000016
             |
       _cons |   7.361327   1.279145     5.75   0.000     4.854248    9.868406
```

```
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   2.029356   1.215376     1.67   0.095    -.3527375    4.411449
         L2. |   .7570687   1.348646     0.56   0.575    -1.886228    3.400365
             |
          ni |
         L1. |   .0914288   .5547541     0.16   0.869    -.9958692    1.178727
         L2. |   .0748557   .2534113     0.30   0.768    -.4218214    .5715328
             |
       _cons |  -3.700303   6.243305    -0.59   0.553    -15.93696    8.536349
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  7.316     2    0.026     |
  |               env                ALL |  7.316     2    0.026     |
  |--------------------------------------+---------------------------|
  |                ni                env | 2.9542     2    0.228     |
  |                ni                ALL | 2.9542     2    0.228     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -23.62001                         AIC             =  8.405004
FPE            =  23.61598                         HQIC            =  7.735252
Det(Sigma_ml)  =  1.257656                         SBIC            =  8.504306

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .246305   0.8145   35.11932   0.0000
curra                5     17.8569   0.5547   9.965521   0.0410
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.079901   .0946223    -0.84   0.398    -.2653573    .1055553
         L2. |   .0118405   .0881317     0.13   0.893    -.1608945    .1845755
             |
       curra |
         L1. |   .0238649   .0052718     4.53   0.000     .0135325    .0341974
         L2. |  -.0249244   .0046546    -5.35   0.000    -.0340473   -.0158016
             |
       _cons |   5.250899   .4602806    11.41   0.000     4.348766    6.153032
```

```
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   .8252414   6.860036     0.12   0.904    -12.62018    14.27067
         L2. |   10.90495   6.389476     1.71   0.088    -1.618196    23.42809
             |
       curra |
         L1. |   .4425583    .382198     1.16   0.247    -.3065361    1.191653
         L2. |  -.3074133   .3374554    -0.91   0.362    -.9688138    .3539873
             |
       _cons |   56.95208   33.36996     1.71   0.088    -8.451835     122.356
------------------------------------------------------------------------------

. est store curraregg

. vargranger, estimates (curraregg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  32.625     2    0.000    |
  |               env                ALL |  32.625     2    0.000    |
  |--------------------------------------+---------------------------|
  |             curra                env |  3.3268     2    0.189    |
  |             curra                ALL |  3.3268     2    0.189    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.87615                         AIC             =  10.21904
FPE            =  144.8874                         HQIC            =  9.549285
Det(Sigma_ml)  =  7.715896                         SBIC            =  10.31834

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .249552   0.8095   34.00448   0.0000
asset                5     33.0783   0.6866   17.52739   0.0015
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1030153   .0959142    -1.07   0.283    -.2910037    .0849732
         L2. |  -.1221818   .0929618    -1.31   0.189    -.3043835    .0600199
             |
       asset |
         L1. |   .0138928   .0027265     5.10   0.000      .008549    .0192366
         L2. |  -.0109549    .002208    -4.96   0.000    -.0152825   -.0066273
             |
       _cons |   5.121642    .415335    12.33   0.000       4.3076    5.935683
```

```
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   5.310116   12.71349     0.42   0.676    -19.60786    30.22809
         L2. |   18.86095   12.32213     1.53   0.126    -5.289985    43.01189
             |
       asset |
         L1. |   .6199671   .3613972     1.72   0.086    -.0883584    1.328293
         L2. |  -.3804687   .2926707    -1.30   0.194    -.9540927    .1931553
             |
       _cons |   78.99801   55.05289     1.43   0.151    -28.90367    186.8997
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  31.575     2    0.000    |
  |               env                ALL |  31.575     2    0.000    |
  |--------------------------------------+---------------------------|
  |             asset                env |   2.873     2    0.238    |
  |             asset                ALL |   2.873     2    0.238    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -19.69451                         AIC             =  7.423627
FPE            =  8.851149                         HQIC            =  6.753876
Det(Sigma_ml)  =   .471363                         SBIC            =  7.522929

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .18116   0.8996   71.70679   0.0000
currl                5     12.1387   0.4989   7.965493   0.0929
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1767478   .0620321     2.85   0.004     .0551672    .2983285
         L2. |  -.1117311   .0541765    -2.06   0.039    -.2179151   -.0055472
             |
       currl |
         L1. |   .0197279    .003898     5.06   0.000     .0120879    .0273679
         L2. |  -.0305123   .0040301    -7.57   0.000    -.0384112   -.0226134
             |
       _cons |   5.287122   .3833928    13.79   0.000     4.535686    6.038558
```

```
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   3.684955   4.156497     0.89   0.375    -4.461629    11.83154
         L2. |   3.542361   3.630129     0.98   0.329    -3.572561    10.65728
             |
       currl |
         L1. |   .3571773   .2611899     1.37   0.171    -.1547455    .8691001
         L2. |  -.5467315   .2700414    -2.02   0.043    -1.076003   -.0174601
             |
       _cons |   49.84795   25.68946     1.94   0.052    -.5024745    100.1984
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  67.097     2    0.000    |
  |               env                ALL |  67.097     2    0.000    |
  |--------------------------------------+---------------------------|
  |             currl                env |  3.3405     2    0.188    |
  |             currl                ALL |  3.3405     2    0.188    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -12.32627                         AIC             =  5.581568
FPE            =  1.402825                         HQIC            =  4.911817
Det(Sigma_ml)  =  .0747067                         SBIC            =   5.68087

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .318504   0.6898   17.78625   0.0014
ltd                   5     2.40388   0.7534   24.44397   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5559372   .1814288     3.06   0.002     .2003433    .9115311
         L2. |  -.1864963   .1130755    -1.65   0.099    -.4081202    .0351276
             |
         ltd |
         L1. |  -.0032161   .0285719    -0.11   0.910     -.059216    .0527838
         L2. |   .0882456   .0224491     3.93   0.000     .0442462     .132245
             |
       _cons |   2.580716   .7094185     3.64   0.000     1.190281    3.971151
```

```
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -1.883096   1.369318    -1.38   0.169     -4.56691    .8007171
         L2. |  -1.180648   .8534274    -1.38   0.167    -2.853335    .4920387
             |
         ltd |
         L1. |   .5550139    .215644     2.57   0.010     .1323594    .9776683
         L2. |   .0535409   .1694327     0.32   0.752     -.278541    .3856228
             |
       _cons |   15.69267   5.354274     2.93   0.003     5.198487    26.18685
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  16.295     2    0.000    |
  |               env                ALL |  16.295     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  10.905     2    0.004    |
  |               ltd                ALL |  10.905     2    0.004    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -22.30274                         AIC             =  8.075684
FPE            =  16.98964                         HQIC            =  7.405932
Det(Sigma_ml)  =  .9047739                         SBIC            =  8.174986

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .219342   0.8529   46.37201   0.0000
tl                   5     13.4305   0.6453   14.55309   0.0057
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.077569   .0805181    -0.96   0.335    -.2353816    .0802436
         L2. |  -.0482769   .0674404    -0.72   0.474    -.1804578    .0839039
             |
          tl |
         L1. |   .0238663   .0040872     5.84   0.000     .0158554    .0318771
         L2. |  -.0208417   .0042125    -4.95   0.000    -.0290981   -.0125853
             |
       _cons |   5.186127    .481013    10.78   0.000     4.243359    6.128896
```

```
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -1.035644   4.930195    -0.21   0.834    -10.69865     8.62736
         L2. |   4.927349   4.129438     1.19   0.233      -3.1662     13.0209
             |
          tl |
         L1. |   .5888971   .2502655     2.35   0.019     .0983857    1.079408
         L2. |  -.8234579   .2579374    -3.19   0.001    -1.329006   -.3179099
             |
       _cons |   100.6368   29.45285     3.42   0.001     42.91029    158.3634
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  43.227     2    0.000    |
  |               env                ALL |  43.227     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |   1.575     2    0.455    |
  |                tl                ALL |   1.575     2    0.455    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.54203                         AIC             =  9.385508
FPE            =  62.95549                         HQIC            =  8.715756
Det(Sigma_ml)  =  3.352659                         SBIC            =   9.48481

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .302456   0.7202   20.59523   0.0004
oe                   5     17.1726   0.8367   40.99481   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1240355   .1230879    -1.01   0.314    -.3652834    .1172124
         L2. |  -.2090117   .1340215    -1.56   0.119     -.471689    .0536655
             |
          oe |
         L1. |   .0303905   .0076063     4.00   0.000     .0154824    .0452987
         L2. |  -.0236218    .005591    -4.22   0.000    -.0345799   -.0126637
             |
       _cons |      5.219   .4677573    11.16   0.000     4.302213    6.135788
```

```
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   4.368764   6.988585     0.63   0.532    -9.328612    18.06614
         L2. |   10.09347   7.609362     1.33   0.185    -4.820608    25.00754
             |
          oe |
         L1. |   .6289183   .4318663     1.46   0.145    -.2175241    1.475361
         L2. |  -.1250442   .3174391    -0.39   0.694    -.7472133    .4971249
             |
       _cons |   14.06837   26.55794     0.53   0.596    -37.98423    66.12098
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  18.941     2    0.000    |
  |               env                ALL |  18.941     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  2.0939     2    0.351    |
  |                oe                ALL |  2.0939     2    0.351    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
9.log
  log type:  text
 closed on:   2 Jul 2012, 17:23:39
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
10.log
  log type:  text
 opened on:   2 Jul 2012, 17:23:49

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -23.42203                         AIC             =  8.355507
FPE            =  22.47554                         HQIC            =  7.685756
Det(Sigma_ml)  =  1.196922                         SBIC            =  8.454809

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                   5     .356054   0.9702   260.3711   0.0000
revtot                5     9.68221   0.9618   201.6735   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6622067   .2409112     2.75   0.006     .1900293    1.134384
         L2. |   .8238095   .2598125     3.17   0.002     .3145864    1.333033
             |
      revtot |
         L1. |  -.0071154   .0055533    -1.28   0.200    -.0179997    .0037689
         L2. |  -.0084303   .0086104    -0.98   0.328    -.0253064    .0084458
             |
       _cons |   2.195577    3.37575     0.65   0.515    -4.420772    8.811925
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   55.67503   6.551112     8.50   0.000     42.83509    68.51498
         L2. |   17.97886   7.065096     2.54   0.011     4.131529    31.82619
             |
      revtot |
         L1. |   .1749471   .1510114     1.16   0.247    -.1210299     .470924
         L2. |   1.244843   .2341437     5.32   0.000     .7859301    1.703756
             |
       _cons |    -548.93   91.79697    -5.98   0.000    -728.8488   -369.0113
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  22.732     2    0.000    |
  |               env                ALL |  22.732     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  78.414     2    0.000    |
  |            revtot                ALL |  78.414     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -17.59035                         AIC             =  6.897586
FPE            =  5.230497                         HQIC            =  6.227835
Det(Sigma_ml)  =  .2785472                         SBIC            =  6.996888

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                  5      .31559   0.9766   333.6041   0.0000
cos                  5      4.6389   0.9795   381.9332   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.315139   .3675637     3.58   0.000     .5947269     2.03555
         L2. |   1.293707   .2712316     4.77   0.000     .7621026    1.825311
             |
         cos |
         L1. |   -.040175   .0125571    -3.20   0.001    -.0647864   -.0155635
         L2. |   .0359642   .0251081     1.43   0.152    -.0132467    .0851751
             |
       _cons |  -8.574844   6.137397    -1.40   0.162    -20.60392    3.454233
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   51.26401   5.402875     9.49   0.000     40.67457    61.85345
         L2. |   19.47461   3.986874     4.88   0.000     11.66048    27.28874
             |
         cos |
         L1. |  -.0252075   .1845786    -0.14   0.891    -.3869749      .33656
         L2. |   2.224507   .3690674     6.03   0.000     1.501149    2.947866
             |
       _cons |  -671.3809   90.21454    -7.44   0.000    -848.1982   -494.5637
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  31.118     2    0.000    |
  |               env                ALL |  31.118     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  90.953     2    0.000    |
  |               cos                ALL |  90.953     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -9.25854                         AIC             =  4.814635
FPE            =  .6515215                         HQIC            =  4.144883
Det(Sigma_ml)  =  .0346964                         SBIC            =  4.913937

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                   5     .344612   0.9721   278.4886   0.0000
ni                    5     3.29037   0.8523   46.17857   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .8204331   .2169706     3.78   0.000     .3951785    1.245688
         L2. |   .9205913   .2353877     3.91   0.000     .4592398    1.381943
             |
          ni |
         L1. |  -.0174544   .0266866    -0.65   0.513    -.0697591    .0348504
         L2. |  -.0413539   .0309398    -1.34   0.181    -.1019949     .019287
             |
       _cons |  -3.865429   1.721531    -2.25   0.025    -7.239568     -.49129
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   10.22049   2.071643     4.93   0.000     6.160147    14.28084
         L2. |  -3.327132    2.24749    -1.48   0.139    -7.732132    1.077867
             |
          ni |
         L1. |  -.3069958   .2548045    -1.20   0.228    -.8064035    .1924119
         L2. |   1.014486   .2954147     3.43   0.001     .4354839    1.593488
             |
       _cons |  -29.53335   16.43724    -1.80   0.072    -61.74974    2.683047
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  24.807     2    0.000    |
  |               env                ALL |  24.807     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ni                env |  24.772     2    0.000    |
  |                ni                ALL |  24.772     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -26.40205                         AIC             =  9.100513
FPE            =  47.34365                         HQIC            =  8.430761
Det(Sigma_ml)  =  2.521259                         SBIC            =  9.199815

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                   5     .607216   0.9133   84.27466   0.0000
curra                 5     7.40039   0.9599   191.6888   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.215834   .2628502     4.63   0.000      .700657    1.731011
         L2. |   .7049449   .4194967     1.68   0.093    -.1172535    1.527143
             |
       curra |
         L1. |  -.0113855   .0114241    -1.00   0.319    -.0337763    .0110054
         L2. |   .0112838   .0075531     1.49   0.135    -.0035199    .0260876
             |
       _cons |    -5.7097   3.176085    -1.80   0.072    -11.93471     .515312
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -32.58615   3.203463   -10.17   0.000    -38.86482   -26.30748
         L2. |   15.62146   5.112578     3.06   0.002     5.600988    25.64192
             |
       curra |
         L1. |   .4543759   .1392302     3.26   0.001     .1814898    .7272621
         L2. |  -.7189358   .0920523    -7.81   0.000    -.8993551   -.5385166
             |
       _cons |   344.2109   38.70824     8.89   0.000     268.3442    420.0777
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.5667     2    0.277    |
  |               env                ALL |  2.5667     2    0.277    |
  |--------------------------------------+---------------------------|
  |             curra                env |  131.85     2    0.000    |
  |             curra                ALL |  131.85     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -31.0729                         AIC             =  10.26822
FPE            =  152.1923                         HQIC            =  9.598473
Det(Sigma_ml)  =  8.104915                         SBIC            =  10.36753

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                   5     .477894   0.9463   140.9726   0.0000
asset                 5     16.0573   0.9081   79.07145   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.065174   .2188421     4.87   0.000     .6362516    1.494097
         L2. |   1.204562   .3287541     3.66   0.000     .5602157    1.848908
             |
       asset |
         L1. |   -.010925   .0042478    -2.57   0.010    -.0192505   -.0025996
         L2. |   .0097976   .0039452     2.48   0.013     .0020652      .01753
             |
       _cons |  -7.275461   2.734841    -2.66   0.008    -12.63565   -1.915271
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -25.35158   7.353112    -3.45   0.001    -39.76341   -10.93974
         L2. |  -9.004133   11.04617    -0.82   0.415    -30.65422    12.64595
             |
       asset |
         L1. |   .7914125   .1427251     5.55   0.000     .5116764    1.071149
         L2. |  -.9801035   .1325587    -7.39   0.000    -1.239914   -.7202932
             |
       _cons |    753.976   91.89088     8.21   0.000     573.8732    934.0788
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  9.0594     2    0.011    |
  |               env                ALL |  9.0594     2    0.011    |
  |--------------------------------------+---------------------------|
  |             asset                env |  29.152     2    0.000    |
  |             asset                ALL |  29.152     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -17.81099                         AIC             =  6.952747
FPE            =  5.527123                         HQIC            =  6.282996
Det(Sigma_ml)  =  .2943438                         SBIC            =  7.052049

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                  5     .410914   0.9603   193.4959   0.0000
currl                5     11.7556   0.3985   5.300736   0.2578
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.017925   .1614337     6.31   0.000     .7015208    1.334329
         L2. |   1.106834   .2870211     3.86   0.000     .5442833    1.669385
             |
       currl |
         L1. |  -.0038981    .007442    -0.52   0.600    -.0184841    .0106878
         L2. |   .0254699   .0072541     3.51   0.000     .0112521    .0396878
             |
       _cons |  -8.972469   1.335606    -6.72   0.000    -11.59021    -6.35473
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -1.655961    4.61836    -0.36   0.720    -10.70778    7.395859
         L2. |    10.3171   8.211213     1.26   0.209     -5.77658    26.41078
             |
       currl |
         L1. |   .2146229   .2129026     1.01   0.313    -.2026584    .6319043
         L2. |  -.1427656   .2075295    -0.69   0.491    -.5495159    .2639847
             |
       _cons |   26.65471   38.20954     0.70   0.485    -48.23462     101.544
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  15.074     2    0.001    |
  |               env                ALL |  15.074     2    0.001    |
  |--------------------------------------+---------------------------|
  |             currl                env |  1.9504     2    0.377    |
  |             currl                ALL |  1.9504     2    0.377    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -18.3292                         AIC             =    7.0823
FPE            =  6.291629                         HQIC            =  6.412548
Det(Sigma_ml)  =  .3350572                         SBIC            =  7.181602

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                   5     .488801   0.9438   134.3982   0.0000
ltd                   5     7.64013   0.9338   112.7989   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .9564755   .3587985     2.67   0.008     .2532434    1.659708
         L2. |   .8079272   .3321015     2.43   0.015     .1570203    1.458834
             |
         ltd |
         L1. |  -.0168049   .0179086    -0.94   0.348    -.0519051    .0182954
         L2. |    .018586   .0065516     2.84   0.005     .0057451    .0314268
             |
       _cons |  -4.923724   2.064206    -2.39   0.017    -8.969493   -.8779551
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -22.86174   5.608143    -4.08   0.000     -33.8535   -11.86999
         L2. |   .8643662   5.190859     0.17   0.868    -9.309531    11.03826
             |
         ltd |
         L1. |  -.0659335   .2799178    -0.24   0.814    -.6145622    .4826952
         L2. |   -.427103   .1024032    -4.17   0.000    -.6278096   -.2263964
             |
       _cons |   155.4647   32.26424     4.82   0.000     92.22795    218.7014
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  8.3065     2    0.016    |
  |               env                ALL |  8.3065     2    0.016    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  22.752     2    0.000    |
  |               ltd                ALL |  22.752     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -20.08045                         AIC             =  7.520113
FPE            =  9.747721                         HQIC            =  6.850362
Det(Sigma_ml)  =  .5191094                         SBIC            =  7.619415

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                   5     .362104   0.9692   251.4784   0.0000
tl                    5     7.12592   0.8980   70.45858   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.005341   .1592231     6.31   0.000     .6932693    1.317412
         L2. |    1.03794   .2564404     4.05   0.000     .5353261    1.540554
             |
          tl |
         L1. |  -.0107825   .0055743    -1.93   0.053    -.0217079    .0001429
         L2. |   .0146149   .0033595     4.35   0.000     .0080305    .0211994
             |
       _cons |  -7.152819   1.087198    -6.58   0.000    -9.283689   -5.021949
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -16.30568   3.133381    -5.20   0.000    -22.44699   -10.16436
         L2. |   10.57513   5.046539     2.10   0.036      .684096    20.46617
             |
          tl |
         L1. |   .1830239   .1096975     1.67   0.095    -.0319793     .398027
         L2. |   -.276508   .0661117    -4.18   0.000    -.4060845   -.1469315
             |
       _cons |   187.1082   21.39518     8.75   0.000     145.1745     229.042
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  21.714     2    0.000    |
  |               env                ALL |  21.714     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  33.964     2    0.000    |
  |                tl                ALL |  33.964     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.38806                         AIC             =  9.347016
FPE            =  60.57825                         HQIC            =  8.677264
Det(Sigma_ml)  =  3.226061                         SBIC            =  9.446318

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
```

```
env                  5     .412975   0.9599   191.4898   0.0000
oe                   5     15.8817   0.8139   34.98543   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7033571    .227947     3.09   0.002     .2565892    1.150125
         L2. |   .7719282    .299721     2.58   0.010     .1844859    1.359371
             |
          oe |
         L1. |   .0011723   .0097956     0.12   0.905    -.0180267    .0203714
         L2. |  -.0198379   .0123155    -1.61   0.107    -.0439759       .0043
             |
       _cons |   2.652988   3.191091     0.83   0.406    -3.601435    8.907411
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -10.82344   8.766131    -1.23   0.217    -28.00474    6.357856
         L2. |  -18.31547   11.52633    -1.59   0.112    -40.90667    4.275727
             |
          oe |
         L1. |   1.678805    .376708     4.46   0.000     .9404712    2.417139
         L2. |   -1.25574   .4736162    -2.65   0.008     -2.18401    -.327469
             |
       _cons |   351.4281   122.7194     2.86   0.004     110.9025    591.9536
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  14.844     2    0.001    |
  |               env                ALL |  14.844     2    0.001    |
  |--------------------------------------+---------------------------|
  |                oe                env |  4.6844     2    0.096    |
  |                oe                ALL |  4.6844     2    0.096    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
10.log
  log type:  text
 closed on:   2 Jul 2012, 17:26:42
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
11.log
  log type:  text
 opened on:   2 Jul 2012, 17:26:52
```

```
. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -15.19143                        AIC             =  6.297858
FPE            =  2.871338                        HQIC            =  5.628106
Det(Sigma_ml)  =  .1529115                        SBIC            =   6.39716

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .476523   0.8608   49.45851   0.0000
revtot               5     3.91606   0.8532   46.49397   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.811042    .298822    -2.71   0.007    -1.396722   -.2253617
         L2. |   1.231711    .297145     4.15   0.000     .6493174    1.814105
             |
      revtot |
         L1. |   .0296546   .0250734     1.18   0.237    -.0194883    .0787975
         L2. |  -.0162517   .0243314    -0.67   0.504    -.0639404     .031437
             |
       _cons |   1.173865   2.712459     0.43   0.665    -4.142456    6.490187
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -2.877669   2.455714    -1.17   0.241    -7.690779    1.935441
         L2. |    2.89911   2.441933     1.19   0.235     -1.88699     7.68521
             |
      revtot |
         L1. |   .9941288   .2060524     4.82   0.000     .5902734    1.397984
         L2. |  -.8297057   .1999551    -4.15   0.000    -1.221611   -.4378008
             |
       _cons |    117.731   22.29094     5.28   0.000     74.04161    161.4205
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  1.4255     2    0.490    |
  |               env                ALL |  1.4255     2    0.490    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  1.4465     2    0.485    |
  |            revtot                ALL |  1.4465     2    0.485    |
```

```
  +-------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -10.91914                         AIC             =  5.229786
FPE            =  .9867938                         HQIC            =  4.560034
Det(Sigma_ml)  =  .0525512                         SBIC            =  5.329088

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .493986   0.8504   45.4678   0.0000
cos                  5     2.50695   0.8435   43.10889   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.9023536   .2853727    -3.16   0.002    -1.461674   -.3430335
         L2. |   1.341807   .2951671     4.55   0.000     .7632905    1.920324
             |
         cos |
         L1. |   .0301768   .0343935     0.88   0.380    -.0372333    .0975869
         L2. |  -.018417     .033047    -0.56   0.577    -.0831879    .0463539
             |
       _cons |   1.951383   2.738163     0.71   0.476    -3.415317    7.318083
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -5.467598    1.44825    -3.78   0.000    -8.306116    -2.62908
         L2. |   4.588556   1.497956     3.06   0.002     1.652615    7.524496
             |
         cos |
         L1. |   .9137312   .1745453     5.23   0.000     .5716287    1.255834
         L2. |  -.5567302   .1677115    -3.32   0.001    -.8854387   -.2280217
             |
       _cons |   65.20056   13.89602     4.69   0.000     37.96487    92.43626
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  .77088     2    0.680    |
  |               env                ALL |  .77088     2    0.680    |
  |--------------------------------------+---------------------------|
  |               cos                env |  14.706     2    0.001    |
  |               cos                ALL |  14.706     2    0.001    |
```

```
  +--------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -10.79711                         AIC             =  5.199277
FPE            =  .9571425                         HQIC            =  4.529525
Det(Sigma_ml)  =  .0509721                         SBIC            =  5.298579

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .413025   0.8954   68.48369   0.0000
ni                   5     1.69977   0.6087   12.44379   0.0143
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8202888   .2576675    -3.18   0.001    -1.325308   -.3152699
         L2. |   1.618996   .4641399     3.49   0.000     .7092982    2.528693
             |
          ni |
         L1. |   .0720741   .1080954     0.67   0.505     -.139789    .2839372
         L2. |  -.2522175   .1632931    -1.54   0.122    -.5722662    .0678312
             |
       _cons |     2.4903   .4113035     6.05   0.000      1.68416    3.296441
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -1.661227   1.060409    -1.57   0.117     -3.73959    .4171359
         L2. |   3.669566   1.910128     1.92   0.055    -.0742171    7.413349
             |
          ni |
         L1. |   .2894407   .4448574     0.65   0.515    -.5824638    1.161345
         L2. |  -1.359118   .6720191    -2.02   0.043    -2.676251   -.0419848
             |
       _cons |   2.366454   1.692685     1.40   0.162    -.9511473    5.684055
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  4.5464     2    0.103    |
  |               env                ALL |  4.5464     2    0.103    |
  |--------------------------------------+---------------------------|
  |                ni                env |  3.7619     2    0.152    |
  |                ni                ALL |  3.7619     2    0.152    |
```

```
  +-------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -17.77196                         AIC             =  6.942989
FPE            =  5.473448                         HQIC            =  6.273237
Det(Sigma_ml)  =  .2914854                         SBIC            =  7.042291

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .50978   0.8407   42.20602   0.0000
curra                5      3.8266   0.4203   5.801017   0.2145
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8820443   .3073495    -2.87   0.004    -1.484438   -.2796504
         L2. |   1.378102   .3675403     3.75   0.000     .6577365    2.098468
             |
       curra |
         L1. |   .0183207   .0432829     0.42   0.672    -.0665122    .1031535
         L2. |  -.0027167   .0397198    -0.07   0.945    -.0805661    .0751326
             |
       _cons |   1.772114    2.89409     0.61   0.540    -3.900198    7.444427
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -3.627447   2.307081    -1.57   0.116    -8.149242     .894348
         L2. |   3.901478   2.758895     1.41   0.157    -1.505858    9.308813
             |
       curra |
         L1. |    .427396   .3248974     1.32   0.188    -.2093912    1.064183
         L2. |   .0661244   .2981516     0.22   0.824     -.518242    .6504908
             |
       _cons |   34.48918   21.72413     1.59   0.112    -8.089321    77.06769
------------------------------------------------------------------------------

. est store curraureg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  .23582     2    0.889    |
  |               env                ALL |  .23582     2    0.889    |
  |--------------------------------------+---------------------------|
  |             curra                env |  2.4776     2    0.290    |
  |             curra                ALL |  2.4776     2    0.290    |
```

```
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -21.52927                         AIC             =  7.882317
FPE            =  14.00251                         HQIC            =  7.212565
Det(Sigma_ml)  =   .745696                         SBIC            =  7.981619

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .509043   0.8411   42.35151   0.0000
asset                5     5.32943   0.8243   37.53675   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.873624    .286103    -3.05   0.002    -1.434376   -.3128724
         L2. |    1.36784   .2711333     5.04   0.000     .8364288    1.899252
             |
       asset |
         L1. |  -.0061469   .0158206    -0.39   0.698    -.0371547    .0248608
         L2. |   .0068434   .0144919     0.47   0.637    -.0215602    .0352469
             |
       _cons |   2.701695    2.88482     0.94   0.349    -2.952449    8.355838
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   -4.06814   2.995357    -1.36   0.174    -9.938932    1.802652
         L2. |   7.967515   2.838631     2.81   0.005       2.4039    13.53113
             |
       asset |
         L1. |   .4295794   .1656335     2.59   0.009     .1049436    .7542151
         L2. |  -.4863395   .1517227    -3.21   0.001    -.7837106   -.1889684
             |
       _cons |   182.0456   30.20264     6.03   0.000     122.8495    241.2416
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  .25969     2    0.878    |
  |               env                ALL |  .25969     2    0.878    |
  |--------------------------------------+---------------------------|
  |             asset                env |  16.874     2    0.000    |
  |             asset                ALL |  16.874     2    0.000    |
```

```
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -14.00136                         AIC             =   6.00034
FPE            =  2.132425                         HQIC            =  5.330588
Det(Sigma_ml)  =  .1135611                         SBIC            =  6.099642

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .506275   0.8428   42.90367   0.0000
currl                5     1.79958   0.9526    160.658   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.9352532   .3241784    -2.88   0.004    -1.570631   -.2998753
         L2. |   1.449586    .354646     4.09   0.000     .7544924    2.144679
             |
       currl |
         L1. |  -.0219073   .0457174    -0.48   0.632    -.1115117    .0676972
         L2. |   .0221868   .0431649     0.51   0.607    -.0624148    .1067883
             |
       _cons |   2.708749   4.146351     0.65   0.514    -5.417948    10.83545
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -3.495946   1.152309    -3.03   0.002     -5.75443   -1.237461
         L2. |  -3.652621   1.260608    -2.90   0.004    -6.123368   -1.181874
             |
       currl |
         L1. |   .6196952    .162505     3.81   0.000     .3011913    .9381991
         L2. |  -.8692281   .1534318    -5.67   0.000    -1.169949   -.5685073
             |
       _cons |   101.2335   14.73842     6.87   0.000     72.34674    130.1203
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  .35026     2    0.839    |
  |               env                ALL |  .35026     2    0.839    |
  |--------------------------------------+---------------------------|
  |             currl                env |      36     2    0.000    |
  |             currl                ALL |      36     2    0.000    |
```

```
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -23.59967                         AIC             =  8.399917
FPE            =  23.49616                         HQIC            =  7.730165
Det(Sigma_ml)  =  1.251275                         SBIC            =  8.499219

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .472733   0.8630   50.38341   0.0000
ltd                  5      6.32604   0.7593   25.23558   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.6240171    .345384    -1.81   0.071    -1.300957    .0529232
         L2. |   1.222308   .3109098     3.93   0.000     .6129363     1.83168
             |
         ltd |
         L1. |  -.0361861   .0289164    -1.25   0.211    -.0928612     .020489
         L2. |   .0217694   .0453419     0.48   0.631     -.067099    .1106378
             |
       _cons |   2.597069   .9316434     2.79   0.005     .7710812    4.423056
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -1.740441   4.621872    -0.38   0.706    -10.79914    7.318262
         L2. |    5.98438   4.160544     1.44   0.150    -2.170135     14.1389
             |
         ltd |
         L1. |   .9334659   .3869547     2.41   0.016     .1750486    1.691883
         L2. |   .3621456   .6067573     0.60   0.551    -.8270767    1.551368
             |
       _cons |  -15.00015    12.4671    -1.20   0.229    -39.43522    9.434909
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  1.5772      2    0.454    |
  |               env                ALL |  1.5772      2    0.454    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  6.1685      2    0.046    |
  |               ltd                ALL |  6.1685      2    0.046    |
```

```
  +-----------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -17.57355                         AIC             =  6.893388
FPE            =  5.208586                         HQIC            =  6.223637
Det(Sigma_ml)  =  .2773803                         SBIC            =   6.99269

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .443216   0.8796   58.41896   0.0000
tl                   5     3.45333   0.5972   11.85941   0.0184
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7748738   .2571121    -3.01   0.003    -1.278804   -.2709433
         L2. |    1.34535   .2492345     5.40   0.000      .856859     1.83384
             |
          tl |
         L1. |   -.039042   .0239693    -1.63   0.103    -.0860211     .007937
         L2. |   .0308417   .0230708     1.34   0.181    -.0143762    .0760595
             |
       _cons |   3.166109   2.259735     1.40   0.161    -1.262889    7.595108
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -1.406183     2.0033    -0.70   0.483    -5.332579    2.520212
         L2. |   2.137072   1.941921     1.10   0.271    -1.669023    5.943167
             |
          tl |
         L1. |   .5371268   .1867582     2.88   0.004     .1710875    .9031662
         L2. |  -.3184714   .1797569    -1.77   0.076    -.6707885    .0338456
             |
       _cons |   64.66613   17.60682     3.67   0.000      30.1574    99.17486
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  2.8954     2    0.235    |
  |               env                ALL |  2.8954     2    0.235    |
  |--------------------------------------+---------------------------|
  |                tl                env |  1.3202     2    0.517    |
  |                tl                ALL |  1.3202     2    0.517    |
```

```
  +-------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -19.9258                         AIC             =  7.481451
FPE            =  9.378038                         HQIC            =  6.811699
Det(Sigma_ml)  =  .4994221                         SBIC            =  7.580752

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .498631   0.8476   44.47639   0.0000
oe                   5     3.98291   0.8340   40.19112   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8447936   .2836457    -2.98   0.003    -1.400729   -.2888583
         L2. |   1.214522   .3506145     3.46   0.001     .5273304    1.901714
             |
          oe |
         L1. |   .0211004   .0278747     0.76   0.449    -.0335331    .0757338
         L2. |   .0024624    .030639     0.08   0.936    -.0575889    .0625137
             |
       _cons |   .9536785   3.086102     0.31   0.757     -5.09497    7.002327
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -2.599444   2.265675    -1.15   0.251    -7.040086    1.841199
         L2. |   9.765563   2.800602     3.49   0.000     4.276484    15.25464
             |
          oe |
         L1. |   .3232898   .2226548     1.45   0.147    -.1131056    .7596851
         L2. |   -.861319   .2447349    -3.52   0.000    -1.340991   -.3816475
             |
       _cons |   126.3529   24.65084     5.13   0.000     78.03818    174.6677
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  .60825     2    0.738    |
  |               env                ALL |  .60825     2    0.738    |
  |--------------------------------------+---------------------------|
  |                oe                env |  17.391     2    0.000    |
  |                oe                ALL |  17.391     2    0.000    |
```

```
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
11.log
  log type:  text
 closed on:   2 Jul 2012, 17:29:59
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
12.log
  log type:  text
 opened on:   3 Jul 2012, 11:20:16

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -67.30301                         AIC             =  19.32575
FPE            =   1306252                         HQIC            =    18.656
Det(Sigma_ml)  =  69563.72                         SBIC            =  19.42505

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.15579   0.3859   5.026142   0.2846
revtot               5     201.712   0.8920   66.10352   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0350295   .4149019    -0.08   0.933    -.8482224    .7781634
         L2. |   -.494998   .3790147    -1.31   0.192    -1.237853    .2478571
             |
      revtot |
         L1. |   .0111221   .0106126     1.05   0.295    -.0096782    .0319224
         L2. |   -.005068   .0097445    -0.52   0.603    -.0241669    .0140309
             |
       _cons |   30.40319   11.30862     2.69   0.007     8.238706    52.56768
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |    16.5584   20.13837     0.82   0.411    -22.91208    56.02889
         L2. |  -2.329419   18.39649    -0.13   0.899    -38.38588    33.72704
             |
      revtot |
         L1. |    1.64159   .5151109     3.19   0.001     .6319911    2.651189
         L2. |  -1.046602   .4729759    -2.21   0.027    -1.973618   -.1195863
             |
       _cons |   467.3193    548.894     0.85   0.395    -608.4932    1543.132
------------------------------------------------------------------------------
```

```
. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  2.8819     2    0.237    |
  |               env                ALL |  2.8819     2    0.237    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  .72911     2    0.695    |
  |            revtot                ALL |  .72911     2    0.695    |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood = -62.95931                      AIC             =  18.23983
FPE            =  440977.1                      HQIC            =  17.57008
Det(Sigma_ml)  =  23483.99                      SBIC            =  18.33913

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.66927   0.5212    8.70946   0.0688
cos                  5     111.506   0.9616   200.4609   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3681255   .4186486    -0.88   0.379    -1.188662    .4524107
         L2. |  -.6002447   .3480943    -1.72   0.085    -1.282497    .0820076
             |
         cos |
         L1. |   .0284096    .013858     2.05   0.040     .0012483    .0555708
         L2. |   -.021127     .01294    -1.63   0.103    -.0464889    .0042348
             |
       _cons |   42.70411   12.36342     3.45   0.001     18.47226    66.93596
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |    -7.6855   12.72235    -0.60   0.546    -32.62085    17.24986
         L2. |  -14.46567   10.57827    -1.37   0.171    -35.19871     6.26736
             |
         cos |
         L1. |   2.941868   .4211335     6.99   0.000     2.116462    3.767275
         L2. |  -2.325193   .3932342    -5.91   0.000    -3.095918   -1.554469
             |
       _cons |   1078.442   375.7131     2.87   0.004     342.0581    1814.826
------------------------------------------------------------------------------
```

```
. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  5.9589     2    0.051    |
  |               env                ALL |  5.9589     2    0.051    |
  |--------------------------------------+---------------------------|
  |               cos                env |  1.9727     2    0.373    |
  |               cos                ALL |  1.9727     2    0.373    |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =   -59.281                         AIC             =  17.32025
FPE            =  175811.9                         HQIC            =   16.6505
Det(Sigma_ml)  =  9362.766                         SBIC            =  17.41955

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.03278   0.4217   5.832896   0.2120
ni                   5     97.7466   0.1315   1.211021   0.8763
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2601626   .4566169    -0.57   0.569    -1.155115    .6347901
         L2. |  -.3773151   .3568917    -1.06   0.290     -1.07681    .3221797
             |
          ni |
         L1. |   .0238129   .0162671     1.46   0.143      -.00807    .0556958
         L2. |   .0442997   .0266282     1.66   0.096    -.0078906    .0964901
             |
       _cons |   45.05987   16.30384     2.76   0.006     13.10493    77.01481
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   1.630349   11.06749     0.15   0.883    -20.06152    23.32222
         L2. |   8.848782   8.650345     1.02   0.306    -8.105583    25.80315
             |
          ni |
         L1. |   .0298602   .3942823     0.08   0.940    -.7429189    .8026394
         L2. |   -.530411   .6454149    -0.82   0.411    -1.795401     .734579
             |
       _cons |  -227.9429   395.1727    -0.58   0.564    -1002.467    546.5813
------------------------------------------------------------------------------
```

```
. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  3.5559     2    0.169    |
  |               env                ALL |  3.5559     2    0.169    |
  |--------------------------------------+---------------------------|
  |                ni                env |  1.0479     2    0.592    |
  |                ni                ALL |  1.0479     2    0.592    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -55.42941                        AIC             =  16.35735
FPE            =  67122.42                        HQIC            =   15.6876
Det(Sigma_ml)  =  3574.567                        SBIC            =  16.45666

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.25254   0.3569   4.440131   0.3497
curra                5     89.4183   0.9188   90.52903   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5890757   .3285916     1.79   0.073     -.054952    1.233104
         L2. |  -.0453883   .3646025    -0.12   0.901    -.7599961    .6692195
             |
       curra |
         L1. |  -.0174581   .0141747    -1.23   0.218      -.04524    .0103238
         L2. |   .0210818    .013696     1.54   0.124    -.0057618    .0479254
             |
       _cons |   11.27391   11.31923     1.00   0.319    -10.91136    33.45919
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   11.74973   6.909302     1.70   0.089    -1.792248    25.29172
         L2. |   16.57111   7.666503     2.16   0.031     1.545036    31.59718
             |
       curra |
         L1. |   .6672262   .2980513     2.24   0.025     .0830563    1.251396
         L2. |   .0736157   .2879853     0.26   0.798    -.4908252    .6380565
             |
       _cons |    -498.87   238.0096    -2.10   0.036    -965.3602   -32.37979
------------------------------------------------------------------------------
```

```
. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.3924     2    0.302    |
  |               env                ALL |  2.3924     2    0.302    |
  |--------------------------------------+---------------------------|
  |             curra                env |  8.3171     2    0.016    |
  |             curra                ALL |  8.3171     2    0.016    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -64.87311                         AIC             =  18.71828
FPE            =  711547.2                         HQIC            =  18.04853
Det(Sigma_ml)  =  37893.05                         SBIC            =  18.81758

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.85272   0.4722   7.156087   0.1279
asset                5     171.656   0.9468   142.4125   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6935264   .2969036     2.34   0.019     .1116061    1.275447
         L2. |  -.0061743   .3092308    -0.02   0.984    -.6122555    .5999069
             |
       asset |
         L1. |  -.0107892   .0055859    -1.93   0.053    -.0217373     .000159
         L2. |   .0125472   .0059465     2.11   0.035     .0008922    .0242022
             |
       _cons |   6.818087   11.42408     0.60   0.551    -15.57271    29.20888
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   26.49768   13.22838     2.00   0.045     .5705235    52.42484
         L2. |   55.77942   13.77762     4.05   0.000     28.77578    82.78305
             |
       asset |
         L1. |   .2723216   .2488766     1.09   0.274    -.2154676    .7601108
         L2. |    .955121   .2649443     3.60   0.000     .4358396    1.474402
             |
       _cons |  -2694.112   508.9942    -5.29   0.000    -3691.723   -1696.502
------------------------------------------------------------------------------
```

```
. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  4.6613     2    0.097    |
  |               env                ALL |  4.6613     2    0.097    |
  |--------------------------------------+---------------------------|
  |             asset                env |  25.537     2    0.000    |
  |             asset                ALL |  25.537     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -56.92811                         AIC             =  16.73203
FPE            =  97630.75                         HQIC            =  16.06228
Det(Sigma_ml)  =  5199.271                         SBIC            =  16.83133

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.02598   0.4236   5.879678   0.2083
currl                5     49.0903   0.8882   63.57561   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1912655   .3558263     0.54   0.591    -.5061412    .8886722
         L2. |   .3132356   .3542832     0.88   0.377    -.3811466    1.007618
             |
       currl |
         L1. |  -.0276828   .0165657    -1.67   0.095     -.060151    .0047854
         L2. |   .0195955   .0159715     1.23   0.220    -.0117081    .0508991
             |
       _cons |   23.39818   26.38526     0.89   0.375    -28.31598    75.11234
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   11.06658   4.338728     2.55   0.011     2.562834    19.57033
         L2. |   16.46909   4.319912     3.81   0.000     8.002223    24.93597
             |
       currl |
         L1. |   .6931153    .201992     3.43   0.001     .2972182    1.089012
         L2. |   .4311055   .1947471     2.21   0.027     .0494082    .8128028
             |
       _cons |  -905.9798   321.7257    -2.82   0.005    -1536.551    -275.409
------------------------------------------------------------------------------
```

```
. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  3.595      2    0.166    |
  |               env                ALL |  3.595      2    0.166    |
  |--------------------------------------+---------------------------|
  |             currl                env | 37.491      2    0.000    |
  |             currl                ALL | 37.491      2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -54.73812                         AIC             =  16.18453
FPE            =  56469.14                         HQIC            =  15.51478
Det(Sigma_ml)  =  3007.232                         SBIC            =  16.28383

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.22671   0.6298   13.60735   0.0087
ltd                  5      87.007   0.9097   80.55659   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2681562    .315104    -0.85   0.395    -.8857486    .3494363
         L2. |  -.0753552   .2389929    -0.32   0.753    -.5437728    .3930623
             |
         ltd |
         L1. |   .0242742   .0153291     1.58   0.113    -.0057704    .0543187
         L2. |  -.0633056   .0211115    -3.00   0.003    -.1046833   -.0219279
             |
       _cons |   56.97465   13.63682     4.18   0.000     30.24698    83.70232
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -9.645185    8.49665    -1.14   0.256    -26.29831    7.007944
         L2. |   17.42704   6.444347     2.70   0.007      4.79635    30.05773
             |
         ltd |
         L1. |   2.410013   .4133435     5.83   0.000     1.599874    3.220151
         L2. |  -1.115395   .5692625    -1.96   0.050    -2.231129    .0003392
             |
       _cons |  -308.3171   367.7112    -0.84   0.402    -1029.018    412.3836
------------------------------------------------------------------------------
```

```
. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  10.051     2    0.007    |
  |               env                ALL |  10.051     2    0.007    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  7.5912     2    0.022    |
  |               ltd                ALL |  7.5912     2    0.022    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -63.55765                        AIC             =  18.38941
FPE            =    512129                        HQIC            =  17.71966
Det(Sigma_ml)  =  27273.14                        SBIC            =  18.48871

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.25631   0.3558   4.418088   0.3524
tl                   5     133.808   0.9174   88.83127   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .3986331    .360385     1.11   0.269    -.3077085    1.104975
         L2. |    .329379    .416952     0.79   0.430     -.487832     1.14659
             |
          tl |
         L1. |  -.0173284   .0113666    -1.52   0.127    -.0396065    .0049497
         L2. |   .0157865   .0158985     0.99   0.321     -.015374     .046947
             |
       _cons |   11.43901   27.43352     0.42   0.677    -42.32969    65.20771
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   34.59183   11.32958     3.05   0.002     12.38626     56.7974
         L2. |   51.96128    13.1079     3.96   0.000     26.27025     77.6523
             |
          tl |
         L1. |   .7145499    .357337     2.00   0.046     .0141822    1.414917
         L2. |   1.331267   .4998085     2.66   0.008     .3516606    2.310874
             |
       _cons |  -4062.719   862.4395    -4.71   0.000    -5753.069   -2372.368
------------------------------------------------------------------------------
```

```
. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  2.374     2    0.305     |
  |               env                ALL |  2.374     2    0.305     |
  |--------------------------------------+---------------------------|
  |                tl                env | 28.317     2    0.000     |
  |                tl                ALL | 28.317     2    0.000     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -62.67738                         AIC             =  18.16934
FPE            =  410965.3                         HQIC            =  17.49959
Det(Sigma_ml)  =  21885.73                         SBIC            =  18.26865

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.07673   0.4090   5.536216   0.2366
oe                   5     152.113   0.8078   33.63337   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5981783   .3667938     1.63   0.103    -.1207244    1.317081
         L2. |  -.4066608   .3535668    -1.15   0.250    -1.099639    .2863174
             |
          oe |
         L1. |  -.0094254   .0092371    -1.02   0.308    -.0275298     .008679
         L2. |   .0149849   .0083948     1.79   0.074    -.0014686    .0314384
             |
       _cons |   21.14469    10.6908     1.98   0.048     .1910974    42.09828
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   13.78697   13.68594     1.01   0.314    -13.03698    40.61093
         L2. |   16.15102   13.19241     1.22   0.221    -9.705633    42.00767
             |
          oe |
         L1. |   .1511397   .3446583     0.44   0.661    -.5243781    .8266576
         L2. |   .4977842   .3132302     1.59   0.112    -.1161357    1.111704
             |
       _cons |  -529.3094   398.8991    -1.33   0.185    -1311.137    252.5183
------------------------------------------------------------------------------
```

```
. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |   3.308     2    0.191    |
  |               env                ALL |   3.308     2    0.191    |
  |--------------------------------------+---------------------------|
  |                oe                env |  3.0046     2    0.223    |
  |                oe                ALL |  3.0046     2    0.223    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
12.log
  log type:  text
 closed on:   3 Jul 2012, 11:23:10
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
13.log
  log type:  text
 opened on:   3 Jul 2012, 11:23:19

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -54.69908                         AIC             =  16.17477
FPE            =  55920.69                         HQIC            =  15.50502
Det(Sigma_ml)  =  2978.025                         SBIC            =  16.27407

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.65371   0.8541   46.82869   0.0000
revtot               5      117.291   0.9213   93.65484   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .4617259   .3744902     1.23   0.218    -.2722614    1.195713
         L2. |  -.0783959    .375595    -0.21   0.835    -.8145486    .6577568
             |
```

```
      revtot |
         L1. |  -.0006703   .0026821    -0.25   0.803     -.005927    .0045865
         L2. |   .0054896    .003367     1.63   0.103    -.0011097    .0120888
             |
       _cons |   8.519578     5.5512     1.53   0.125    -2.360574    19.39973
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   33.38725   26.56104     1.26   0.209    -18.67143    85.44593
         L2. |   54.33044    26.6394     2.04   0.041      2.11818    106.5427
             |
      revtot |
         L1. |   1.317929   .1902274     6.93   0.000       .94509    1.690767
         L2. |  -1.365526   .2388084    -5.72   0.000    -1.833582   -.8974703
             |
       _cons |  -540.1741   393.7236    -1.37   0.170    -1311.858      231.51
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  2.747      2    0.253     |
  |               env                ALL |  2.747      2    0.253     |
  |--------------------------------------+---------------------------|
  |            revtot                env | 8.0029      2    0.018     |
  |            revtot                ALL | 8.0029      2    0.018     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -54.15448                         AIC             =  16.03862
FPE            =  48802.59                         HQIC            =  15.36887
Det(Sigma_ml)  =  2598.955                         SBIC            =  16.13792

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.64855   0.8550   47.17225   0.0000
cos                  5     88.4709   0.9469   142.7644   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .4312226   .3708577     1.16   0.245    -.2956452     1.15809
         L2. |  -.0837211    .376472    -0.22   0.824    -.8215926    .6541504
             |
```

```
         cos |
         L1. |  -.0001274   .0035376    -0.04   0.971     -.007061    .0068062
         L2. |   .0058964   .0038563     1.53   0.126    -.0016618    .0134545
             |
       _cons |   9.834347   6.209518     1.58   0.113    -2.336084    22.00478
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   36.46078   19.90235     1.83   0.067    -2.547111    75.46867
         L2. |   24.07897   20.20364     1.19   0.233    -15.51944    63.67738
             |
         cos |
         L1. |   1.512865   .1898489     7.97   0.000     1.140768    1.884962
         L2. |  -1.390738   .2069494    -6.72   0.000    -1.796351   -.9851247
             |
       _cons |  -464.6602   333.2383    -1.39   0.163    -1117.795    188.4748
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  2.8143     2    0.245    |
  |               env                ALL |  2.8143     2    0.245    |
  |--------------------------------------+---------------------------|
  |               cos                env |  6.4295     2    0.040    |
  |               cos                ALL |  6.4295     2    0.040    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -48.59025                         AIC             =  14.64756
FPE            =  12142.67                         HQIC            =  13.97781
Det(Sigma_ml)  =  646.6512                         SBIC            =  14.74686

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.80292   0.8266   38.12902   0.0000
ni                   5      40.486   0.6927   18.03301   0.0012
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7084933   .3642717     1.94   0.052    -.0054662    1.422453
         L2. |    .109824   .3714353     0.30   0.767    -.6181758    .8378237
             |
```

```
          ni |
         L1. |   -.012374   .0121492    -1.02   0.308    -.036186     .011438
         L2. |   .0218203   .0442471     0.49   0.622   -.0649025    .1085431
             |
       _cons |    4.78778   5.316254     0.90   0.368   -5.631887    15.20745
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -5.420841   8.180003    -0.66   0.508   -21.45335    10.61167
         L2. |   13.14899   8.340865     1.58   0.115   -3.198806    29.49679
             |
          ni |
         L1. |   .7464123   .2728197     2.74   0.006    .2116955    1.281129
         L2. |  -2.927703   .9936038    -2.95   0.003   -4.875131   -.9802755
             |
       _cons |  -86.41338   119.3806    -0.72   0.469    -320.395    147.5683
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  1.0418     2    0.594    |
  |               env                ALL |  1.0418     2    0.594    |
  |--------------------------------------+---------------------------|
  |                ni                env |  2.9096     2    0.233    |
  |                ni                ALL |  2.9096     2    0.233    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -47.24081                         AIC             =   14.3102
FPE            =  8665.659                         HQIC            =  13.64045
Det(Sigma_ml)  =  461.4848                         SBIC            =  14.40951

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.88536   0.8104   34.18304   0.0000
curra                5     36.9531   0.9559   173.5146   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7716383   .3527887     2.19   0.029    .0801852    1.463091
         L2. |   .2542881   .3992263     0.64   0.524    -.528181    1.036757
             |
```

```
       curra |
         L1. |  -.0026285   .0051279    -0.51   0.608    -.0126789    .0074219
         L2. |   .0012208   .0056366     0.22   0.829    -.0098268    .0122683
             |
       _cons |   1.529901    3.84258     0.40   0.691    -6.001417    9.061219
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -12.37799   6.914654    -1.79   0.073    -25.93047    1.174478
         L2. |    57.9114   7.824831     7.40   0.000     42.57501    73.24778
             |
       curra |
         L1. |   .5793606   .1005059     5.76   0.000     .3823726    .7763485
         L2. |  -.9955786   .1104773    -9.01   0.000     -1.21211   -.7790471
             |
       _cons |  -147.1608   75.31452    -1.95   0.051    -294.7745    .4529464
------------------------------------------------------------------------------

. est store curra reg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  .26833     2    0.874    |
  |               env                ALL |  .26833     2    0.874    |
  |--------------------------------------+---------------------------|
  |             curra                env |  86.434     2    0.000    |
  |             curra                ALL |  86.434     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.75335                         AIC             =  12.18834
FPE            =  1038.214                         HQIC            =  11.51859
Det(Sigma_ml)  =  55.28953                         SBIC            =  12.28764

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.85282   0.8168   35.67787   0.0000
asset                5     23.8995   0.9846   512.7031   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7373101   .3357505     2.20   0.028     .0792513    1.395369
         L2. |   .2299365   .3621517     0.63   0.525    -.4798678    .9397409
             |
```

```
       asset |
         L1. |  -.0024619   .0037691    -0.65   0.514    -.0098492    .0049253
         L2. |   .0023297   .0045928     0.51   0.612     -.006672    .0113314
             |
       _cons |   2.155869   5.731012     0.38   0.707    -9.076709    13.38845
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -22.07382   4.330844    -5.10   0.000    -30.56212   -13.58552
         L2. |    58.4817   4.671394    12.52   0.000     49.32594    67.63747
             |
       asset |
         L1. |   .5557992    .048617    11.43   0.000     .4605116    .6510869
         L2. |  -1.130579   .0592422   -19.08   0.000    -1.246692   -1.014467
             |
       _cons |    1301.95    73.9243    17.61   0.000     1157.061    1446.839
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  .56133     2    0.755    |
  |               env                ALL |  .56133     2    0.755    |
  |--------------------------------------+---------------------------|
  |             asset                env |  242.11     2    0.000    |
  |             asset                ALL |  242.11     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -42.02415                         AIC             =  13.00604
FPE            =  2351.848                         HQIC            =  12.33629
Det(Sigma_ml)  =  125.2464                         SBIC            =  13.10534

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.84849   0.8177   35.88259   0.0000
currl                5     16.3739   0.9809   410.8848   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7502173    .336684     2.23   0.026     .0903287    1.410106
         L2. |   .2354115   .3608401     0.65   0.514    -.4718222    .9426451
             |
```

```
       currl |
         L1. |  -.0046178   .0060004    -0.77   0.442    -.0163784    .0071428
         L2. |   .0000833   .0076811     0.01   0.991    -.0149713    .0151379
             |
       _cons |   3.813756   5.210694     0.73   0.464    -6.399017    14.02653
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -26.54277   2.982336    -8.90   0.000    -32.38804    -20.6975
         L2. |   34.19465   3.196309    10.70   0.000        27.93     40.4593
             |
       currl |
         L1. |   .4934975   .0531513     9.28   0.000     .3893227    .5976722
         L2. |  -1.222288   .0680387   -17.96   0.000    -1.355641   -1.088934
             |
       _cons |   700.8565   46.15614    15.18   0.000     610.3921    791.3209
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  .60146     2    0.740    |
  |               env                ALL |  .60146     2    0.740    |
  |--------------------------------------+---------------------------|
  |             currl                env |  115.22     2    0.000    |
  |             currl                ALL |  115.22     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -36.26174                         AIC             =  11.56543
FPE            =  556.8828                         HQIC            =  10.89568
Det(Sigma_ml)  =  29.65648                         SBIC            =  11.66474

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.38233   0.8981   70.47021   0.0000
ltd                  5     13.1216   0.9583   183.6186   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.132989   .3153072     3.59   0.000     .5149983     1.75098
         L2. |  -.9039971    .502844    -1.80   0.072    -1.889553    .0815591
             |
```

```
         ltd |
         L1. |   .0640843   .0236582     2.71   0.007      .017715    .1104536
         L2. |  -.0673674   .0281391    -2.39   0.017    -.1225191   -.0122157
             |
       _cons |   18.20136   9.258129     1.97   0.049     .0557605    36.34696
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   7.874093   2.993016     2.63   0.009      2.00789     13.7403
         L2. |   16.03115   4.773186     3.36   0.001     6.675877    25.38642
             |
         ltd |
         L1. |  -.1412352    .224573    -0.63   0.529    -.5813903    .2989198
         L2. |   1.433491   .2671075     5.37   0.000     .9099703    1.957012
             |
       _cons |  -585.9393   87.88168    -6.67   0.000    -758.1843   -413.6944
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  7.381      2    0.025    |
  |               env                ALL |  7.381      2    0.025    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  83.12      2    0.000    |
  |               ltd                ALL |  83.12      2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -43.55566                         AIC             =  13.38892
FPE            =  3448.984                         HQIC            =  12.71916
Det(Sigma_ml)  =  183.6737                         SBIC            =  13.48822

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.8988   0.8076   33.58792   0.0000
tl                   5     22.0692   0.9478   145.1649   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7052119   .3477255     2.03   0.043     .0236825    1.386741
         L2. |   .2889324   .3646157     0.79   0.428    -.4257012    1.003566
             |
```

```
          tl |
         L1. |  -.0026152   .0071745    -0.36   0.715    -.0166769    .0114465
         L2. |   .0001231   .0066701     0.02   0.985    -.0129501    .0131964
             |
       _cons |    3.53926   7.280034     0.49   0.627    -10.72934    17.80786
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -23.07209   4.041499    -5.71   0.000    -30.99328    -15.1509
         L2. |   32.87358   4.237809     7.76   0.000     24.56763    41.17953
             |
          tl |
         L1. |   .4385302   .0833865     5.26   0.000     .2750957    .6019647
         L2. |  -.6535348   .0775249    -8.43   0.000    -.8054807   -.5015888
             |
       _cons |   819.0249   84.61344     9.68   0.000     653.1856    984.8642
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  .15167     2    0.927    |
  |               env                ALL |  .15167     2    0.927    |
  |--------------------------------------+---------------------------|
  |                tl                env |  65.597     2    0.000    |
  |                tl                ALL |  65.597     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -48.76742                        AIC             =  14.69186
FPE            =  12692.62                        HQIC            =   14.0221
Det(Sigma_ml)  =  675.9382                        SBIC            =  14.79116

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.59275   0.8646   51.10584   0.0000
oe                   5     65.8675   0.6502   14.86863   0.0050
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5731639   .3263229     1.76   0.079    -.0664173    1.212745
         L2. |  -.0176492   .3368147    -0.05   0.958    -.6777939    .6424955
             |
```

```
          oe |
         L1. |  -.0064812   .0059349    -1.09   0.275    -.0181133     .005151
         L2. |   .0196686   .0111502     1.76   0.078    -.0021854    .0415227
             |
       _cons |   4.687735   3.578872     1.31   0.190    -2.326726     11.7022
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   4.104036   13.49493     0.30   0.761    -22.34554    30.55361
         L2. |   25.96667   13.92881     1.86   0.062    -1.333301    53.26664
             |
          oe |
         L1. |   .7432433   .2454334     3.03   0.002     .2622028    1.224284
         L2. |  -1.332207   .4611131    -2.89   0.004    -2.235972   -.4284414
             |
       _cons |   107.4028   148.0026     0.73   0.468    -182.6769    397.4825
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  3.5854     2    0.167    |
  |               env                ALL |  3.5854     2    0.167    |
  |--------------------------------------+---------------------------|
  |                oe                env |  5.8193     2    0.054    |
  |                oe                ALL |  5.8193     2    0.054    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
13.log
  log type:  text
 closed on:   3 Jul 2012, 11:34:29
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
14.log
  log type:  text
 opened on:   3 Jul 2012, 11:34:39

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -29.92178                         AIC             =  9.980445
FPE            =  114.1331                         HQIC            =  9.310694
```

```
Det(Sigma_ml)  =  6.078094                          SBIC            =  10.07975

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.05969   0.8779   57.50985   0.0000
revtot               5     6.64679   0.9603   193.3519   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3465182    .388639    -0.89   0.373    -1.108237    .4152002
         L2. |   .0475332   .8176793     0.06   0.954    -1.555089    1.650155
             |
      revtot |
         L1. |  -.0643937   .0471499    -1.37   0.172    -.1568057    .0280183
         L2. |  -.0423711   .0631468    -0.67   0.502    -.1661365    .0813943
             |
       _cons |   27.80739   9.382789     2.96   0.003     9.417458    46.19732
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   18.93826   2.437685     7.77   0.000     14.16049    23.71604
         L2. |   5.086282   5.128782     0.99   0.321    -4.965946    15.13851
             |
      revtot |
         L1. |   1.055339   .2957411     3.57   0.000     .4756973    1.634981
         L2. |   .8683712   .3960795     2.19   0.028     .0920695    1.644673
             |
       _cons |  -294.9385   58.85227    -5.01   0.000    -410.2868   -179.5901
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  17.524     2    0.000     |
  |               env                ALL |  17.524     2    0.000     |
  |--------------------------------------+---------------------------|
  |            revtot                env |  74.462     2    0.000     |
  |            revtot                ALL |  74.462     2    0.000     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                                No. of obs      =         8
Log likelihood = -26.97819                          AIC             =  9.244547
FPE            =  54.67829                          HQIC            =  8.574795
```

```
Det(Sigma_ml)  =  2.911862                          SBIC            =  9.343849

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5       1.0916   0.8704   53.73662   0.0000
cos                  5     4.31982   0.9736   295.1505   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2147641   .3833566    -0.56   0.575    -.9661292     .536601
         L2. |  -.0916522   1.011558    -0.09   0.928    -2.074269    1.890965
             |
         cos |
         L1. |  -.0710902   .0857989    -0.83   0.407     -.239253    .0970726
         L2. |  -.0552555   .1153338    -0.48   0.632    -.2813055    .1707945
             |
       _cons |   22.71651   9.596275     2.37   0.018      3.90816    41.52487
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   12.35165   1.517072     8.14   0.000     9.378243    15.32506
         L2. |   3.157393   4.003079     0.79   0.430    -4.688497    11.00328
             |
         cos |
         L1. |   1.238463   .3395356     3.65   0.000     .5729857    1.903941
         L2. |   .3794448   .4564149     0.83   0.406     -.515112    1.274002
             |
       _cons |  -150.2634   37.97573    -3.96   0.000    -224.6944   -75.83231
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  16.054     2    0.000    |
  |               env                ALL |  16.054     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  82.806     2    0.000    |
  |               cos                ALL |  82.806     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                                No. of obs      =         8
Log likelihood = -20.45579                          AIC             =  7.613947
FPE            =  10.70667                          HQIC            =  6.944195
```

```
Det(Sigma_ml)  =  .5701777                          SBIC            =  7.713249

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.8539   0.6262   13.40412   0.0095
ni                   5     1.12877   0.8720   54.48501   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.040941     .34749     3.00   0.003     .3598734    1.722009
         L2. |  -.0499321    .729743    -0.07   0.945    -1.480202    1.380338
             |
          ni |
         L1. |   -.172823   .3024907    -0.57   0.568    -.7656938    .4200478
         L2. |  -.0000152   .2235765    -0.00   1.000    -.4382171    .4381867
             |
       _cons |   .5020975   2.504619     0.20   0.841    -4.406865     5.41106
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   1.032891   .2115736     4.88   0.000      .618214    1.447567
         L2. |  -3.022322   .4443131    -6.80   0.000     -3.89316   -2.151484
             |
          ni |
         L1. |   .7603518   .1841752     4.13   0.000     .3993751    1.121329
         L2. |  -.0663385   .1361273    -0.49   0.626    -.3331432    .2004661
             |
       _cons |   12.02486   1.524968     7.89   0.000     9.035981    15.01375
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  .33962     2    0.844    |
  |               env                ALL |  .33962     2    0.844    |
  |--------------------------------------+---------------------------|
  |                ni                env |  50.959     2    0.000    |
  |                ni                ALL |  50.959     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                                No. of obs      =         8
Log likelihood = -39.12935                          AIC             =  12.28234
FPE            =   1140.54                          HQIC            =  11.61259
```

```
Det(Sigma_ml)  =   60.7388                         SBIC            =  12.38164

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.27735   0.8226   37.08639   0.0000
curra                5     16.3861   0.3552   4.407881   0.3536
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5902658   .5014886     1.18   0.239    -.3926338    1.573165
         L2. |   .4092571   .4246207     0.96   0.335    -.4229842    1.241498
             |
       curra |
         L1. |  -.0773687   .0444144    -1.74   0.082    -.1644193    .0096819
         L2. |  -.0290379   .0722556    -0.40   0.688    -.1706562    .1125804
             |
       _cons |   12.99633   8.076078     1.61   0.108    -2.832489    28.82516
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   6.502617   6.433157     1.01   0.312    -6.106138    19.11137
         L2. |  -8.269628   5.447086    -1.52   0.129    -18.94572    2.406464
             |
       curra |
         L1. |   .5870775   .5697533     1.03   0.303    -.5296183    1.703773
         L2. |   .1864949   .9269031     0.20   0.841    -1.630202    2.003192
             |
       _cons |   40.46495   103.6009     0.39   0.696    -162.5891     243.519
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  9.5669     2    0.008    |
  |               env                ALL |  9.5669     2    0.008    |
  |--------------------------------------+---------------------------|
  |             curra                env |  3.1069     2    0.212    |
  |             curra                ALL |  3.1069     2    0.212    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -41.28291                         AIC             =  12.82073
FPE            =  1954.025                         HQIC            =  12.15097
```

```
Det(Sigma_ml)  =  104.0605                         SBIC            =  12.92003

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .916537   0.9086   79.57258   0.0000
asset                5     31.3421   0.5523   9.867523   0.0427
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5858357   .6222804     0.94   0.346    -.6338114    1.805483
         L2. |   .3574077   .2631325     1.36   0.174    -.1583224    .8731379
             |
       asset |
         L1. |   -.045264   .0180548    -2.51   0.012    -.0806509   -.0098772
         L2. |   .0037545   .0386597     0.10   0.923     -.072017    .0795261
             |
       _cons |   9.908408   8.296623     1.19   0.232    -6.352675    26.16949
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   19.46857   21.27963     0.91   0.360    -22.23873    61.17587
         L2. |  -14.62836   8.998131    -1.63   0.104    -32.26437    3.007653
             |
       asset |
         L1. |   .6744833   .6174073     1.09   0.275    -.5356127    1.884579
         L2. |   .5714914   1.322013     0.43   0.666    -2.019607     3.16259
             |
       _cons |    -69.227    283.713    -0.24   0.807    -625.2943    486.8403
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  26.121     2    0.000    |
  |               env                ALL |  26.121     2    0.000    |
  |--------------------------------------+---------------------------|
  |             asset                env |   3.001     2    0.223    |
  |             asset                ALL |   3.001     2    0.223    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =    -38.14                         AIC             =    12.035
FPE            =  890.6221                         HQIC            =  11.36525
```

```
Det(Sigma_ml)  =  47.42958                        SBIC            =   12.1343

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.02922   0.8848   61.44682   0.0000
currl                5     20.0264   0.1688   1.624619   0.8044
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .9546034   .4152229     2.30   0.022     .1407815    1.768425
         L2. |   .0517791   .2968438     0.17   0.862    -.5300241    .6335822
             |
       currl |
         L1. |  -.0823595   .0191613    -4.30   0.000    -.1199151   -.044804
         L2. |    .027194   .0413391     0.66   0.511    -.0538291    .1082171
             |
       _cons |    4.76852   5.375938     0.89   0.375    -5.768125    15.30516
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -3.100582   8.079364    -0.38   0.701    -18.93585    12.73468
         L2. |  -1.405923   5.775957    -0.24   0.808    -12.72659    9.914744
             |
       currl |
         L1. |   .3676607   .3728393     0.99   0.324    -.3630909    1.098412
         L2. |  -.6086373   .8043716    -0.76   0.449    -2.185177    .9679021
             |
       _cons |   138.9312   104.6044     1.33   0.184    -66.08978    343.9521
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  19.058     2    0.000    |
  |               env                ALL |  19.058     2    0.000    |
  |--------------------------------------+---------------------------|
  |             currl                env |  .52487     2    0.769    |
  |             currl                ALL |  .52487     2    0.769    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -25.82523                        AIC             =  8.956308
FPE            =   40.9859                        HQIC            =  8.286556
```

```
Det(Sigma_ml)  =  2.182681                          SBIC            =   9.05561

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.06353   0.8770   57.03778   0.0000
ltd                  5     3.93917   0.5897    11.4996   0.0215
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1440116   .3118371     0.46   0.644    -.4671779    .7552011
         L2. |   .2608603    .326339     0.80   0.424    -.3787524     .900473
             |
         ltd |
         L1. |  -.3821189   .0919387    -4.16   0.000    -.5623156   -.2019223
         L2. |  -.0237992   .0884738    -0.27   0.788    -.1972047    .1496064
             |
       _cons |   9.638656   3.553414     2.71   0.007     2.674094    16.60322
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   1.760515   1.154999     1.52   0.127    -.5032414    4.024272
         L2. |  -.5242328   1.208712    -0.43   0.664    -2.893265    1.844799
             |
         ltd |
         L1. |   .9975435   .3405277     2.93   0.003     .3301215    1.664965
         L2. |   .2791096   .3276942     0.85   0.394    -.3631592    .9213784
             |
       _cons |  -9.481852   13.16132    -0.72   0.471    -35.27757    16.31387
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  17.34      2    0.000    |
  |               env                ALL |  17.34      2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env | 2.3916      2    0.302    |
  |               ltd                ALL | 2.3916      2    0.302    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                                No. of obs      =         8
Log likelihood = -38.47878                          AIC             =   12.1197
FPE            =  969.3397                          HQIC            =  11.44994
```

```
Det(Sigma_ml)  =  51.62164                         SBIC            =    12.219

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .799572   0.9305   107.0677   0.0000
tl                   5     25.1742   0.2266   2.343293   0.6729
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .9996563   .3597837     2.78   0.005      .2944933    1.704819
         L2. |   .1126931   .2253445     0.50   0.617      -.328974    .5543603
             |
          tl |
         L1. |   -.071934   .0118926    -6.05   0.000      -.095243   -.0486249
         L2. |   .0352878   .0288422     1.22   0.221     -.0212418    .0918174
             |
       _cons |   3.810712   4.911105     0.78   0.438     -5.814877     13.4363
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -2.497786   11.32763    -0.22   0.825     -24.69954    19.70396
         L2. |  -3.086649   7.094874    -0.44   0.664     -16.99235    10.81905
             |
          tl |
         L1. |    .552514   .3744328     1.48   0.140     -.1813609    1.286389
         L2. |  -.5281525   .9080831    -0.58   0.561     -2.307963    1.251658
             |
       _cons |    153.772    154.624     0.99   0.320     -149.2855    456.8294
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  36.833     2    0.000    |
  |               env                ALL |  36.833     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  .48911     2    0.783    |
  |                tl                ALL |  .48911     2    0.783    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -29.64339                         AIC             =  9.910849
FPE            =  106.4599                         HQIC            =  9.241097
```

```
Det(Sigma_ml)  =  5.669463                        SBIC            =  10.01015

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .708121   0.9455    138.708   0.0000
oe                   5     9.43786   0.8073   33.50723   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2147491   .2286974    -0.94   0.348    -.6629877    .2334895
         L2. |  -.7539164   .2652131    -2.84   0.004    -1.273724   -.2341083
             |
          oe |
         L1. |   .1607748   .0440807     3.65   0.000     .0743782    .2471715
         L2. |  -.2487315   .0473987    -5.25   0.000    -.3416313   -.1558317
             |
       _cons |   17.64746   2.493246     7.08   0.000     12.76078    22.53413
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   4.247392   3.048088     1.39   0.163     -1.72675    10.22153
         L2. |   -8.81985   3.534771    -2.50   0.013    -15.74787   -1.891826
             |
          oe |
         L1. |   1.223166   .5875098     2.08   0.037     .0716675    2.374664
         L2. |  -.2557599   .6317319    -0.40   0.686    -1.493932    .9824118
             |
       _cons |   29.28386   33.23009     0.88   0.378    -35.84591    94.41364
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  49.161     2    0.000    |
  |               env                ALL |  49.161     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  9.6651     2    0.008    |
  |                oe                ALL |  9.6651     2    0.008    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
14.log
  log type:  text
 closed on:   3 Jul 2012, 11:37:22
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
```

```
      log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
15.log
  log type:  text
 opened on:   3 Jul 2012, 11:37:29

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                             No. of obs      =         8
Log likelihood = -18.17327                       AIC             =  7.043318
FPE            =  6.051085                       HQIC            =  6.373566
Det(Sigma_ml)  =  .3222471                       SBIC            =  7.142619

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .189156   0.7314   21.78298   0.0002
revtot               5     8.35317   0.5926   11.63477   0.0203
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3279325   .1873008    -1.75   0.080    -.6950353    .0391702
         L2. |  -.5050709   .1788605    -2.82   0.005    -.8556309   -.1545108
             |
      revtot |
         L1. |   .0280122   .0072784     3.85   0.000     .0137467    .0422776
         L2. |    .001434   .0067035     0.21   0.831    -.0117046    .0145726
             |
       _cons |   .2667427   .7643158     0.35   0.727    -1.231289    1.764774
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -3.660281   8.271245    -0.44   0.658    -19.87162    12.55106
         L2. |  -3.711632   7.898518    -0.47   0.638    -19.19244    11.76918
             |
      revtot |
         L1. |   .9636567   .3214169     3.00   0.003     .3336911    1.593622
         L2. |  -.3495244   .2960274    -1.18   0.238    -.9297275    .2306786
             |
       _cons |   73.63695   33.75236     2.18   0.029     7.483542    139.7904
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
```

```
  |            env            revtot |  19.734     2    0.000     |
  |            env               ALL |  19.734     2    0.000     |
  |----------------------------------+--------------------------|
  |         revtot               env |  .38542     2    0.825     |
  |         revtot               ALL |  .38542     2    0.825     |
  +-------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -14.13145                         AIC             =  6.032862
FPE            =  2.202915                         HQIC            =   5.36311
Det(Sigma_ml)  =   .117315                         SBIC            =  6.132164

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .153089   0.8241   37.46952   0.0000
cos                  5     6.40567   0.6816   17.12195   0.0018
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4141469   .1576365    -2.63   0.009    -.7231088    -.105185
         L2. |   -.595816   .1491117    -4.00   0.000    -.8880696   -.3035624
             |
         cos |
         L1. |   .0418557    .008258     5.07   0.000     .0256703     .058041
         L2. |  -.0059675    .007795    -0.77   0.444    -.0212455    .0093104
             |
       _cons |    1.27933   .5199207     2.46   0.014     .2603043    2.298356
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -2.535037   6.595956    -0.38   0.701    -15.46287     10.3928
         L2. |  -3.359847   6.239254    -0.54   0.590    -15.58856    8.868867
             |
         cos |
         L1. |   1.155504   .3455382     3.34   0.001     .4782611    1.832746
         L2. |  -.5690593   .3261654    -1.74   0.081    -1.208332     .070213
             |
       _cons |   55.99759   21.75495     2.57   0.010     13.35868    98.63651
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +-------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |----------------------------------+--------------------------|
```

```
  |              env                 cos |  34.342     2    0.000      |
  |              env                 ALL |  34.342     2    0.000      |
  |--------------------------------------+---------------------------|
  |              cos                 env |  .38851     2    0.823      |
  |              cos                 ALL |  .38851     2    0.823      |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                             No. of obs      =         8
Log likelihood = -1.766497                       AIC             =  2.941624
FPE            =   .100113                       HQIC            =  2.271873
Det(Sigma_ml)  =  .0053315                       SBIC            =  3.040926

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .088066   0.9418   129.4013   0.0000
ni                   5     2.68804   0.4089   5.534652   0.2367
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0212566    .072797    -0.29   0.770    -.1639361    .1214229
         L2. |   -.285351   .0790886    -3.61   0.000    -.4403618   -.1303401
             |
          ni |
         L1. |  -.0642091    .010196    -6.30   0.000     -.084193   -.0442253
         L2. |   .1067999   .0099267    10.76   0.000     .0873438    .1262559
             |
       _cons |   3.021598    .222523    13.58   0.000     2.585461    3.457735
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   2.148239   2.221984     0.97   0.334    -2.206771    6.503248
         L2. |  -3.083672   2.414024    -1.28   0.201    -7.815072    1.647729
             |
          ni |
         L1. |   .6440123    .311214     2.07   0.039     .0340441    1.253981
         L2. |   -.189983   .3029941    -0.63   0.531    -.7838405    .4038746
             |
       _cons |   4.881109   6.792073     0.72   0.472     -8.43111    18.19333
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
```

```
  |              env                   ni |  119.95     2    0.000     |
  |              env                  ALL |  119.95     2    0.000     |
  |---------------------------------------+---------------------------|
  |               ni                  env |  2.3246     2    0.313     |
  |               ni                  ALL |  2.3246     2    0.313     |
  +-------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -6.520065                         AIC             =  4.130016
FPE            =  .3285508                         HQIC            =  3.460265
Det(Sigma_ml)  =  .0174968                         SBIC            =  4.229318

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .256431   0.5063   8.205741   0.0843
curra                5     1.41503   0.9106   81.44882   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1728822   .3408293    -0.51   0.612    -.8408954     .495131
         L2. |  -.2593987   .2324746    -1.12   0.265    -.7150406    .1962433
             |
       curra |
         L1. |  -.0317074   .0363888    -0.87   0.384     -.103028    .0396133
         L2. |  -.0375406   .0272339    -1.38   0.168    -.0909181     .015837
             |
       _cons |   8.555686   2.376971     3.60   0.000     3.896908    13.21446
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -5.401064   1.880752    -2.87   0.004    -9.087271   -1.714858
         L2. |  -6.115093   1.282833    -4.77   0.000      -8.6294   -3.600786
             |
       curra |
         L1. |   .7537698   .2007992     3.75   0.000     .3602107    1.147329
         L2. |  -.2374058   .1502813    -1.58   0.114    -.5319518    .0571402
             |
       _cons |   61.42611   13.11652     4.68   0.000     35.71821    87.13401
------------------------------------------------------------------------------

. est store curraregc

. vargranger, estimates (curraregc)

   Granger causality Wald tests
  +-------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |---------------------------------------+---------------------------|
```

```
  |              env               curra |  7.0909     2    0.029    |
  |              env                 ALL |  7.0909     2    0.029    |
  |--------------------------------------+---------------------------|
  |            curra                 env |  47.129     2    0.000    |
  |            curra                 ALL |  47.129     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -26.50117                         AIC             =  9.125293
FPE            =  48.53148                         HQIC            =  8.455541
Det(Sigma_ml)  =  2.584517                         SBIC            =  9.224595

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .338687   0.1388   1.289879   0.8631
asset                5     13.1383   0.5685   10.53972   0.0323
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1740109    .292644     0.59   0.552    -.3995609    .7475826
         L2. |  -.2754395   .3303239    -0.83   0.404    -.9228624    .3719834
             |
       asset |
         L1. |  -.0065865   .0086487    -0.76   0.446    -.0235376    .0103647
         L2. |  -.0007846   .0130011    -0.06   0.952    -.0262663    .0246972
             |
       _cons |   4.076288   2.433528     1.68   0.094     -.693338    8.845915
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -22.34225   11.35222    -1.97   0.049    -44.59219   -.0923129
         L2. |  -14.62696   12.81389    -1.14   0.254    -39.74172     10.4878
             |
       asset |
         L1. |   .4269706   .3354995     1.27   0.203    -.2305964    1.084538
         L2. |   .3425405   .5043387     0.68   0.497    -.6459451    1.331026
             |
       _cons |   126.3722   94.40116     1.34   0.181    -58.65067    311.3951
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
```

```
  |              env              asset |  .65081     2    0.722     |
  |              env                ALL |  .65081     2    0.722     |
  |-------------------------------------+----------------------------|
  |            asset                env |  5.2893     2    0.071     |
  |            asset                ALL |  5.2893     2    0.071     |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -14.16464                        AIC             =   6.04116
FPE            =  2.221272                        HQIC            =  5.371409
Det(Sigma_ml)  =  .1182926                        SBIC            =  6.140462

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .12764   0.8777   57.40861   0.0000
currl                5     9.46035   0.5835   11.20931   0.0243
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2350773   .1434681    -1.64   0.101    -.5162697    .0461151
         L2. |  -.1132511   .1230334    -0.92   0.357    -.3543922      .12789
             |
       currl |
         L1. |  -.0095474   .0046407    -2.06   0.040    -.0186431   -.0004518
         L2. |  -.0263065   .0049881    -5.27   0.000    -.0360829     -.01653
             |
       _cons |   5.503364   .5115809    10.76   0.000     4.500684    6.506044
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -2.637058   10.63349    -0.25   0.804    -23.47832     18.2042
         L2. |  -23.48444   9.118924    -2.58   0.010     -41.3572   -5.611677
             |
       currl |
         L1. |  -.0868325     .34396    -0.25   0.801    -.7609817    .5873167
         L2. |   .3534442   .3697043     0.96   0.339     -.371163    1.078051
             |
       _cons |   101.6821   37.91707     2.68   0.007     27.36599    175.9982
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
```

```
  |              env              currl |  52.909     2    0.000    |
  |              env                ALL |  52.909     2    0.000    |
  |-------------------------------------+---------------------------|
  |            currl                env |  9.2858     2    0.010    |
  |            currl                ALL |  9.2858     2    0.010    |
  +-----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -20.73154                         AIC             =  7.682884
FPE            =   11.4708                         HQIC            =  7.013133
Det(Sigma_ml)  =  .6108709                         SBIC            =  7.782186

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .275162   0.4316   6.074472   0.1937
ltd                  5     7.87558   0.6783   16.86652   0.0021
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1608686   .2751511    -0.58   0.559    -.7001549    .3784176
         L2. |  -.5425761   .2756315    -1.97   0.049    -1.082804   -.0023483
             |
         ltd |
         L1. |  -.0107882   .0115514    -0.93   0.350    -.0334286    .0118521
         L2. |  -.0096228   .0107231    -0.90   0.370    -.0306398    .0113941
             |
       _cons |   4.626119   1.148173     4.03   0.000     2.375742    6.876496
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -4.130586    7.87528    -0.52   0.600    -19.56585    11.30468
         L2. |  -2.322427    7.88903    -0.29   0.768    -17.78464    13.13979
             |
         ltd |
         L1. |   .3273978   .3306203     0.99   0.322    -.3206061    .9754018
         L2. |   .2852889   .3069136     0.93   0.353    -.3162507    .8868286
             |
       _cons |   19.65994    32.8626     0.60   0.550    -44.74958    84.06946
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +-----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |-------------------------------------+---------------------------|
```

```
  |              env                ltd |  5.1063     2    0.078     |
  |              env                ALL |  5.1063     2    0.078     |
  |-------------------------------------+----------------------------|
  |              ltd                env |   .3224     2    0.851     |
  |              ltd                ALL |   .3224     2    0.851     |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -6.006242                        AIC             =  4.001561
FPE            =  .2889448                        HQIC            =  3.331809
Det(Sigma_ml)  =  .0153876                        SBIC            =  4.100862

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .178102   0.7619   25.59465   0.0000
tl                   5     4.14469   0.9701   259.8339   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2059047   .1750988    -1.18   0.240    -.5490921    .1372826
         L2. |  -.4037715    .223928    -1.80   0.071    -.8426624    .0351194
             |
          tl |
         L1. |  -.0030662   .0082139    -0.37   0.709    -.0191651    .0130327
         L2. |  -.0160201   .0083939    -1.91   0.056    -.0324718    .0004317
             |
       _cons |   5.869096   .8465544     6.93   0.000      4.20988    7.528312
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -14.00336   4.074803    -3.44   0.001    -21.98982   -6.016888
         L2. |  -24.68701    5.21113    -4.74   0.000    -34.90064   -14.47339
             |
          tl |
         L1. |   .1492585   .1911485     0.78   0.435    -.2253856    .5239027
         L2. |   .5380696   .1953382     2.75   0.006     .1552137    .9209254
             |
       _cons |   113.7919   19.70055     5.78   0.000     75.17951    152.4042
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
```

```
|              env                  tl |  23.284     2    0.000     |
|              env                 ALL |  23.284     2    0.000     |
|--------------------------------------+---------------------------|
|               tl                 env |  48.423     2    0.000     |
|               tl                 ALL |  48.423     2    0.000     |
+------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -21.51576                         AIC             =  7.878939
FPE            =   13.9553                         HQIC            =  7.209188
Det(Sigma_ml)  =  .7431815                         SBIC            =  7.978241

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .22825   0.6089   12.45435   0.0143
oe                   5     10.0721   0.7126   19.83882   0.0005
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3489513   .2446839    -1.43   0.154    -.8285229    .1306202
         L2. |  -.4204899   .1993466    -2.11   0.035    -.8112021   -.0297777
             |
          oe |
         L1. |  -.0060326   .0072124    -0.84   0.403    -.0201687    .0081034
         L2. |   .0199483   .0077497     2.57   0.010     .0047591    .0351375
             |
       _cons |    3.19706   .6604506     4.84   0.000       1.9026    4.491519
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   11.62707   10.79726     1.08   0.282    -9.535167     32.7893
         L2. |   10.37594   8.796644     1.18   0.238    -6.865164    27.61705
             |
          oe |
         L1. |   1.085984   .3182652     3.41   0.001     .4621956    1.709772
         L2. |  -.5910422    .341976    -1.73   0.084    -1.261303    .0792185
             |
       _cons |  -8.269673   29.14395    -0.28   0.777    -65.39077    48.85142
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
```

```
  |               env                 oe |  11.047     2    0.004    |
  |               env                ALL |  11.047     2    0.004    |
  |--------------------------------------+---------------------------|
  |                oe                env |  2.3751     2    0.305    |
  |                oe                ALL |  2.3751     2    0.305    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
15.log
  log type:  text
 closed on:   3 Jul 2012, 11:40:35
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
16.log
  log type:  text
 opened on:   3 Jul 2012, 11:40:43

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -3.192512                         AIC             =  3.298128
FPE            =  .1429941                         HQIC            =  2.628376
Det(Sigma_ml)  =  .0076151                         SBIC            =   3.39743

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .299415   0.8681   52.64257   0.0000
revtot               5     1.01078   0.9990   7628.803   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.114108   .2903021     3.84   0.000     .5451262     1.68309
         L2. |   .8277112   .3143321     2.63   0.008     .2116316    1.443791
             |
      revtot |
         L1. |  -.0783115   .0246395    -3.18   0.001    -.1266041    -.030019
         L2. |   .0407596   .0163297     2.50   0.013     .0087539    .0727653
             |
       _cons |   .6934879   .6576363     1.05   0.292    -.5954556    1.982431
-------------+----------------------------------------------------------------
revtot       |
         env |
```

```
         L1. |   19.29658   .9800117    19.69   0.000     17.37579    21.21737
         L2. |   .7653688   1.061133     0.72   0.471    -1.314413    2.845151
             |
      revtot |
         L1. |   .5211386   .0831789     6.27   0.000     .3581109    .6841664
         L2. |  -.1679556   .0551264    -3.05   0.002    -.2760014   -.0599097
             |
       _cons |   -9.81581   2.220071    -4.42   0.000    -14.16707   -5.464551
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  11.681     2    0.003    |
  |               env                ALL |  11.681     2    0.003    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  411.12     2    0.000    |
  |            revtot                ALL |  411.12     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -5.139711                         AIC             =  3.784928
FPE            =  .2326658                         HQIC            =  3.115176
Det(Sigma_ml)  =  .0123905                         SBIC            =   3.88423

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .364475   0.8045   32.92522   0.0000
cos                  5      1.62015   0.9970   2662.592   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    1.04774   .3471855     3.02   0.003     .3672693    1.728211
         L2. |   .6574513    .384305     1.71   0.087    -.0957726    1.410675
             |
         cos |
         L1. |  -.0856187   .0394378    -2.17   0.030    -.1629153    -.008322
         L2. |   .0573342   .0303595     1.89   0.059    -.0021693    .1168377
             |
       _cons |  -.0581862   .9290754    -0.06   0.950    -1.879141    1.762768
-------------+----------------------------------------------------------------
cos          |
         env |
```

```
         L1. |   10.44914   1.543292     6.77   0.000     7.424339    13.47393
         L2. |   2.502684   1.708294     1.47   0.143    -.8455117    5.850879
             |
         cos |
         L1. |   1.193234   .1753069     6.81   0.000     .8496391     1.53683
         L2. |   -.799655   .1349525    -5.93   0.000    -1.064157    -.535153
             |
       _cons |  -7.132235   4.129882    -1.73   0.084    -15.22665    .9621855
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  5.2822     2    0.071    |
  |               env                ALL |  5.2822     2    0.071    |
  |--------------------------------------+---------------------------|
  |               cos                env |  55.363     2    0.000    |
  |               cos                ALL |  55.363     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -2.757666                         AIC             =  3.189417
FPE            =  .1282642                         HQIC            =  2.519665
Det(Sigma_ml)  =  .0068306                         SBIC            =  3.288719

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .366847   0.8020   32.3976   0.0000
ni                    5     .711005   0.9446   136.3215  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.789833   .5367743     3.33   0.001     .7377751    2.841892
         L2. |  -1.025562   .4811743    -2.13   0.033    -1.968646   -.0824777
             |
          ni |
         L1. |  -.3615285   .1599838    -2.26   0.024    -.6750909   -.0479661
         L2. |   .6454764   .3105002     2.08   0.038     .0369072    1.254046
             |
       _cons |  -.2367351   1.006536    -0.24   0.814     -2.20951     1.73604
-------------+----------------------------------------------------------------
ni           |
         env |
```

```
         L1. |   8.604017    1.04035     8.27   0.000     6.564969    10.64307
         L2. |  -9.201275   .9325887    -9.87   0.000    -11.02911   -7.373434
             |
          ni |
         L1. |  -2.396324   .3100728    -7.73   0.000    -3.004055   -1.788592
         L2. |   4.060593   .6017964     6.75   0.000     2.881094    5.240093
             |
       _cons |  -4.197675    1.95082    -2.15   0.031    -8.021212   -.3741391
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  5.1109     2    0.078    |
  |               env                ALL |  5.1109     2    0.078    |
  |--------------------------------------+---------------------------|
  |                ni                env |  120.69     2    0.000    |
  |                ni                ALL |  120.69     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -13.49941                         AIC             =  5.874854
FPE            =  1.880944                         HQIC            =  5.205102
Det(Sigma_ml)  =  .1001686                         SBIC            =  5.974156

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .161584   0.9616   200.222   0.0000
curra                5     5.41226   0.8193   36.2634   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5861895   .1588087     3.69   0.000     .2749302    .8974489
         L2. |   .2791997   .1119145     2.49   0.013     .0598513     .498548
             |
       curra |
         L1. |  -.0248017   .0059959    -4.14   0.000    -.0365535    -.01305
         L2. |  -.0294105   .0066619    -4.41   0.000    -.0424676   -.0163535
             |
       _cons |   4.137073   .5026204     8.23   0.000     3.151956    5.122191
-------------+----------------------------------------------------------------
curra        |
         env |
```

```
         L1. |   24.71579   5.319291     4.65   0.000     14.29017     35.1414
         L2. |  -11.43245   3.748571    -3.05   0.002    -18.77952   -4.085389
             |
       curra |
         L1. |  -.2485182   .2008325    -1.24   0.216    -.6421427    .1451063
         L2. |   .0494154   .2231398     0.22   0.825    -.3879305    .4867613
             |
       _cons |   17.26147   16.83525     1.03   0.305      -15.735    50.25795
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  59.578     2    0.000    |
  |               env                ALL |  59.578     2    0.000    |
  |--------------------------------------+---------------------------|
  |             curra                env |  27.086     2    0.000    |
  |             curra                ALL |  27.086     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -15.73379                         AIC             =  6.433448
FPE            =   3.28829                         HQIC            =  5.763696
Det(Sigma_ml)  =  .1751161                         SBIC            =   6.53275

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .189232   0.9473   143.822   0.0000
asset                5     6.15983   0.9352   115.4073  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .9732393    .192363     5.06   0.000     .5962147    1.350264
         L2. |   .6218023   .1635523     3.80   0.000     .3012457    .9423588
             |
       asset |
         L1. |  -.0257825   .0060167    -4.29   0.000    -.0375751     -.01399
         L2. |  -.0207947   .0051369    -4.05   0.000    -.0308629   -.0107265
             |
       _cons |    3.85144   .5214163     7.39   0.000     2.829482    4.873397
-------------+----------------------------------------------------------------
asset        |
         env |
```

```
          L1. |   41.85696   6.261733     6.68   0.000     29.58419    54.12974
          L2. |  -3.260768   5.323896    -0.61   0.540    -13.69541    7.173877
              |
        asset |
          L1. |  -.4515364   .1958534    -2.31   0.021    -.8354021   -.0676707
          L2. |  -.2737201   .1672154    -1.64   0.102    -.6014563    .0540161
              |
        _cons |   67.37983   16.97296     3.97   0.000     34.11343    100.6462
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  41.273     2    0.000    |
  |               env                ALL |  41.273     2    0.000    |
  |--------------------------------------+---------------------------|
  |             asset                env |  61.786     2    0.000    |
  |             asset                ALL |  61.786     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -11.92292                         AIC             =   5.48073
FPE            =  1.268266                         HQIC            =  4.810979
Det(Sigma_ml)  =  .0675408                         SBIC            =  5.580032

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .181719   0.9514   156.6367   0.0000
currl                5     3.85815   0.9076   78.60924   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
              |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env           |
          env |
          L1. |   .8417146   .1641505     5.13   0.000     .5199855    1.163444
          L2. |   .7239623    .174544     4.15   0.000     .3818622    1.066062
              |
        currl |
          L1. |  -.0716609   .0119472    -6.00   0.000    -.0950769   -.0482448
          L2. |  -.0493824   .0121843    -4.05   0.000    -.0732632   -.0255016
              |
        _cons |   1.560715   .3296835     4.73   0.000     .9145474    2.206883
-------------+----------------------------------------------------------------
currl         |
          env |
```

```
         L1. |   21.92075   3.485152     6.29   0.000     15.08998    28.75152
         L2. |  -4.355471   3.705821    -1.18   0.240    -11.61875    2.907805
             |
       currl |
         L1. |  -1.263157    .253656    -4.98   0.000    -1.760314   -.7660007
         L2. |   .6072682   .2586908     2.35   0.019     .1002435    1.114293
             |
       _cons |  -20.62559   6.999655    -2.95   0.003    -34.34466   -6.906515
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  45.432     2    0.000    |
  |               env                ALL |  45.432     2    0.000    |
  |--------------------------------------+---------------------------|
  |             currl                env |  53.036     2    0.000    |
  |             currl                ALL |  53.036     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -11.92139                         AIC             =  5.480347
FPE            =   1.26778                         HQIC            =  4.810595
Det(Sigma_ml)  =  .0675149                         SBIC            =  5.579649

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .335273   0.8346   40.36466   0.0000
ltd                  5      3.7959   0.8511   45.71941   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5888236   .3199839     1.84   0.066    -.0383334    1.215981
         L2. |   .5822018   .2902447     2.01   0.045     .0133326    1.151071
             |
         ltd |
         L1. |  -.0372203   .0360276    -1.03   0.302    -.1078332    .0333925
         L2. |  -.0423924   .0282836    -1.50   0.134    -.0978273    .0130425
             |
       _cons |   .1171161   .8645442     0.14   0.892     -1.57736    1.811592
-------------+----------------------------------------------------------------
ltd          |
         env |
```

```
         L1. |   9.939383   3.622797     2.74   0.006     2.838831    17.03993
         L2. |   1.469854   3.286095     0.45   0.655    -4.970775    7.910482
             |
         ltd |
         L1. |  -.0024919   .4078978    -0.01   0.995    -.8019569     .796973
         L2. |  -.4412341   .3202219    -1.38   0.168    -1.068858    .1863893
             |
       _cons |   -35.9348   9.788204    -3.67   0.000    -55.11933   -16.75027
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  7.6966     2    0.021    |
  |               env                ALL |  7.6966     2    0.021    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  15.914     2    0.000    |
  |               ltd                ALL |  15.914     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -13.61037                         AIC             =  5.902593
FPE            =  1.933849                         HQIC            =  5.232841
Det(Sigma_ml)  =  .1029861                         SBIC            =  6.001894

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .201481   0.9403   125.9238   0.0000
tl                   5     4.79675   0.9295   105.4684   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .9025806   .2004516     4.50   0.000     .5097027    1.295458
         L2. |   .6484498   .1808147     3.59   0.000     .2940595     1.00284
             |
          tl |
         L1. |  -.0410525   .0093302    -4.40   0.000    -.0593393   -.0227657
         L2. |  -.0197374   .0074175    -2.66   0.008    -.0342755   -.0051994
             |
       _cons |   .7745169   .3910729     1.98   0.048     .0080281    1.541006
-------------+----------------------------------------------------------------
tl           |
         env |
```

```
         L1. |   28.34422   4.772238     5.94   0.000     18.9908    37.69763
         L2. |  -3.938847   4.304735    -0.92   0.360   -12.37597    4.498279
             |
          tl |
         L1. |  -.3548956   .2221271    -1.60   0.110   -.7902569    .0804656
         L2. |    .003064   .1765916     0.02   0.986   -.3430491    .3491771
             |
       _cons |  -36.58684   9.310444    -3.93   0.000   -54.83497    -18.3387
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  35.465     2    0.000    |
  |               env                ALL |  35.465     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  48.085     2    0.000    |
  |                tl                ALL |  48.085     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -2.285999                         AIC             =    3.0715
FPE            =  .1139973                         HQIC            =  2.401748
Det(Sigma_ml)  =  .0060709                         SBIC            =  3.170802

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .176421   0.9542    166.672   0.0000
oe                   5     1.19949   0.9717   275.0841   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.084788   .1895671     5.72   0.000     .7132432    1.456332
         L2. |   .4783689   .1368752     3.49   0.000     .2100984    .7466394
             |
          oe |
         L1. |   -.043043   .0153402    -2.81   0.005   -.0731093   -.0129768
         L2. |  -.1147606   .0181409    -6.33   0.000   -.1503161   -.0792051
             |
       _cons |   11.21541   1.471859     7.62   0.000    8.330618     14.1002
-------------+----------------------------------------------------------------
oe           |
         env |
```

```
         L1. |   13.80361    1.28887    10.71   0.000     11.27747    16.32975
         L2. |  -.9128218   .9306173    -0.98   0.327    -2.736798    .9111547
             |
          oe |
         L1. |   -.276496   .1042984    -2.65   0.008    -.4809171   -.0720749
         L2. |  -1.105157   .1233403    -8.96   0.000    -1.346899   -.8634139
             |
       _cons |   147.6403    10.0072    14.75   0.000     128.0265     167.254
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  48.689     2    0.000    |
  |               env                ALL |  48.689     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  161.98     2    0.000    |
  |                oe                ALL |  161.98     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
16.log
  log type:  text
 closed on:   3 Jul 2012, 11:43:16
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
17.log
  log type:  text
 opened on:   3 Jul 2012, 11:43:25

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -33.43949                         AIC             =  10.85987
FPE            =  275.0057                         HQIC            =  10.19012
Det(Sigma_ml)  =  14.64528                         SBIC            =  10.95917

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .684036   0.8731   55.03382   0.0000
revtot               5      16.3371   0.9651   221.4534   0.0000
```

```
------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .186054   .2653197     0.70   0.483    -.3339631    .7060712
         L2. |   .0139853   .1971087     0.07   0.943    -.3723405    .4003112
             |
      revtot |
         L1. |   .0154253   .0090157     1.71   0.087    -.0022452    .0330958
         L2. |  -.0220295   .0072836    -3.02   0.002    -.0363051   -.0077539
             |
       _cons |   15.50991   3.893224     3.98   0.000     7.879332    23.14049
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -22.39903   6.336738    -3.53   0.000     -34.8188   -9.979247
         L2. |   14.27312   4.707625     3.03   0.002     5.046347     23.4999
             |
      revtot |
         L1. |   1.486039   .2153264     6.90   0.000     1.064007    1.908071
         L2. |  -1.234376   .1739568    -7.10   0.000    -1.575325   -.8934265
             |
       _cons |   761.1432   92.98343     8.19   0.000      578.899    943.3873
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  12.614     2    0.002    |
  |               env                ALL |  12.614     2    0.002    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  12.746     2    0.002    |
  |            revtot                ALL |  12.746     2    0.002    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -35.15112                         AIC             =  11.28778
FPE            =  421.8712                         HQIC            =  10.61803
Det(Sigma_ml)  =  22.46651                         SBIC            =  11.38708

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .680539   0.8744   55.68328   0.0000
cos                  5     19.4935   0.9077   78.71737   0.0000
```

```
-----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1408544    .271915     0.52   0.604    -.3920893    .6737981
         L2. |  -.0258832   .1971945    -0.13   0.896    -.4123773    .3606108
             |
         cos |
         L1. |   .0229577   .0138278     1.66   0.097    -.0041442    .0500596
         L2. |  -.0333825   .0117393    -2.84   0.004    -.0563911   -.0103739
             |
       _cons |   17.01256    3.83878     4.43   0.000     9.488688    24.53643
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -17.64938   7.788779    -2.27   0.023    -32.91511   -2.383655
         L2. |   5.014849   5.648471     0.89   0.375     -6.05595    16.08565
             |
         cos |
         L1. |   1.900166   .3960844     4.80   0.000     1.123854    2.676477
         L2. |  -1.636452    .336262    -4.87   0.000    -2.295513   -.9773904
             |
       _cons |   593.2248   109.9587     5.39   0.000     377.7098    808.7398
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  12.826     2    0.002    |
  |               env                ALL |  12.826     2    0.002    |
  |--------------------------------------+---------------------------|
  |               cos                env |  6.1035     2    0.047    |
  |               cos                ALL |  6.1035     2    0.047    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.31458                         AIC             =  8.828645
FPE            =  36.07373                         HQIC            =  8.158893
Det(Sigma_ml)  =  1.921086                         SBIC            =  8.927947

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .421084   0.9519   158.3388   0.0000
ni                   5     11.7771   0.1787   1.741134   0.7832
```

```
------------------------------------------------------------------

--------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
env          |
         env |
         L1. |  -.2077221   .1956374    -1.06   0.288    -.5911643    .1757201
         L2. |  -.3565354   .1046711    -3.41   0.001     -.561687   -.1513837
             |
          ni |
         L1. |   .0497082   .0075551     6.58   0.000     .0349005    .0645159
         L2. |   .0422367   .0098929     4.27   0.000     .0228471    .0616264
             |
       _cons |   17.80397   2.129942     8.36   0.000     13.62936    21.97858
-------------+------------------------------------------------------------------
ni           |
         env |
         L1. |  -3.067411   5.471681    -0.56   0.575    -13.79171    7.656886
         L2. |   1.451886   2.927493     0.50   0.620    -4.285895    7.189667
             |
          ni |
         L1. |   .2001391   .2113046     0.95   0.344    -.2140103    .6142886
         L2. |   .0067282   .2766884     0.02   0.981    -.5355711    .5490276
             |
       _cons |   34.40449   59.57125     0.58   0.564      -82.353     151.162
--------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  46.397     2    0.000    |
  |               env                ALL |  46.397     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ni                env |  .42862     2    0.807    |
  |                ni                ALL |  .42862     2    0.807    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -24.86776                         AIC             =   8.71694
FPE            =  32.26103                         HQIC            =  8.047188
Det(Sigma_ml)  =  1.718043                         SBIC            =  8.816242

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .780697   0.8347   40.39112   0.0000
curra                5     4.72041   0.9935   1223.861   0.0000
```

```
------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2650954   .3046089     0.87   0.384    -.3319271    .8621179
         L2. |  -.1385047   .2848536    -0.49   0.627    -.6968076    .4197981
             |
       curra |
         L1. |   .0261073   .0212617     1.23   0.219    -.0155648    .0677794
         L2. |  -.0306871   .0139585    -2.20   0.028    -.0580452   -.003329
             |
       _cons |   11.94286   2.972289     4.02   0.000     6.117284    17.76844
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   .7705739    1.84179     0.42   0.676    -2.839267    4.380415
         L2. |   11.33722   1.722341     6.58   0.000     7.961492    14.71295
             |
       curra |
         L1. |   .1745454   .1285567     1.36   0.175     -.077421    .4265119
         L2. |   .0289117   .0843987     0.34   0.732    -.1365067      .19433
             |
       _cons |   116.6622   17.97167     6.49   0.000     81.43839     151.886
------------------------------------------------------------------------------

. est store curraregt

. vargranger, estimates (curraregt)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  7.8252     2    0.020    |
  |               env                ALL |  7.8252     2    0.020    |
  |--------------------------------------+---------------------------|
  |             curra                env |  81.455     2    0.000    |
  |             curra                ALL |  81.455     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -32.50799                         AIC             =    10.627
FPE            =  217.8742                         HQIC            =  9.957246
Det(Sigma_ml)  =  11.60277                         SBIC            =   10.7263

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .86235   0.7983   31.66102   0.0000
asset                5     49.2463   0.4788    7.35009   0.1185
```

```
------------------------------------------------------------------

--------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
env          |
         env |
         L1. |    1.09244   .3858536     2.83   0.005      .336181    1.848699
         L2. |  -.5876922   .2934208    -2.00   0.045    -1.162786   -.012598
             |
       asset |
         L1. |   .0132591   .0072248     1.84   0.066    -.0009013    .0274195
         L2. |  -.0070097   .0040614    -1.73   0.084    -.0149699    .0009505
             |
       _cons |   .9914563   6.930259     0.14   0.886     -12.5916    14.57451
-------------+------------------------------------------------------------------
asset        |
         env |
         L1. |   5.090985   22.03496     0.23   0.817    -38.09673     48.2787
         L2. |   1.593167   16.75639     0.10   0.924    -31.24876    34.43509
             |
       asset |
         L1. |   .2940695   .4125878     0.71   0.476    -.5145878    1.102727
         L2. |  -.2792024    .231935    -1.20   0.229    -.7337865    .1753818
             |
       _cons |   701.2772   395.7666     1.77   0.076    -74.41108    1476.965
--------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  4.9702     2    0.083    |
  |               env                ALL |  4.9702     2    0.083    |
  |--------------------------------------+---------------------------|
  |             asset                env |  .96256     2    0.618    |
  |             asset                ALL |  .96256     2    0.618    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -40.22171                         AIC             =  12.55543
FPE            =  1498.693                         HQIC            =  11.88568
Det(Sigma_ml)  =  79.81205                         SBIC            =  12.65473

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .940913   0.7599   25.31444   0.0000
currl                5     28.6721   0.3436   4.187567   0.3812
```

```
------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .580358   .5015714     1.16   0.247    -.4027039     1.56342
         L2. |  -.2893873   .3167255    -0.91   0.361    -.9101577    .3313832
             |
       currl |
         L1. |  -.0008368   .0118267    -0.07   0.944    -.0240167     .022343
         L2. |  -.0137741   .0083025    -1.66   0.097    -.0300468    .0024985
             |
       _cons |   13.02496   6.855576     1.90   0.057    -.4117203    26.46164
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -8.440172   15.28421    -0.55   0.581    -38.39668    21.51634
         L2. |   11.81808   9.651467     1.22   0.221    -7.098448    30.73461
             |
       currl |
         L1. |  -.1180071   .3603896    -0.33   0.743    -.8243578    .5883435
         L2. |   .1832891   .2529997     0.72   0.469    -.3125811    .6791593
             |
       _cons |   240.0784   208.9076     1.15   0.250     -169.373    649.5298
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  2.8947     2    0.235    |
  |               env                ALL |  2.8947     2    0.235    |
  |--------------------------------------+---------------------------|
  |             currl                env |  3.3107     2    0.191    |
  |             currl                ALL |  3.3107     2    0.191    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -37.10895                         AIC             =  11.77724
FPE            =  688.2533                         HQIC            =  11.10749
Det(Sigma_ml)  =  36.65254                         SBIC            =  11.87654

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.05303   0.6992   18.5981   0.0009
ltd                  5     15.8934   0.8346   40.37643   0.0000
```

```
------------------------------------------------------------------

--------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
env          |
         env |
         L1. |   .5463115   .4301094     1.27   0.204    -.2966875    1.389311
         L2. |   .0319369    .393771     0.08   0.935    -.7398402    .8037139
             |
         ltd |
         L1. |   .0134985   .0179779     0.75   0.453    -.0217375    .0487346
         L2. |   .0034407   .0112404     0.31   0.760    -.0185901    .0254715
             |
       _cons |   4.102838   2.416079     1.70   0.089    -.6325893    8.838264
-------------+------------------------------------------------------------------
ltd          |
         env |
         L1. |  -11.20704   6.491655    -1.73   0.084    -23.93045    1.516368
         L2. |   .9052789   5.943198     0.15   0.879    -10.74317    12.55373
             |
         ltd |
         L1. |   .4872918   .2713412     1.80   0.073    -.0445272    1.019111
         L2. |   -.329809   .1696516    -1.94   0.052      -.66232    .0027021
             |
       _cons |   187.6972   36.46594     5.15   0.000     116.2252    259.1691
--------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  .69831     2    0.705    |
  |               env                ALL |  .69831     2    0.705    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  23.471     2    0.000    |
  |               ltd                ALL |  23.471     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -36.04793                         AIC             =  11.51198
FPE            =   527.898                         HQIC            =  10.84223
Det(Sigma_ml)  =  28.11291                         SBIC            =  11.61128

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .777383   0.8361   40.8046   0.0000
tl                   5     21.7904   0.5267   8.901597   0.0636
```

```
------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.165951   .4255051     2.74   0.006     .3319764    1.999926
         L2. |  -.7363839   .2459415    -2.99   0.003     -1.21842   -.2543474
             |
          tl |
         L1. |   .0241374   .0149573     1.61   0.107    -.0051784    .0534531
         L2. |  -.0234775   .0100322    -2.34   0.019    -.0431402   -.0038149
             |
       _cons |    6.70337   12.35258     0.54   0.587    -17.50725    30.91399
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -16.97095   11.92708    -1.42   0.155    -40.34759    6.405695
         L2. |   9.863174   6.893838     1.43   0.153    -3.648501    23.37485
             |
          tl |
         L1. |  -.5600313   .4192589    -1.34   0.182    -1.381764     .261701
         L2. |   .3769206   .2812052     1.34   0.180    -.1742314    .9280726
             |
       _cons |   603.6989   346.2478     1.74   0.081    -74.93436    1282.332
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  7.9604     2    0.019    |
  |               env                ALL |  7.9604     2    0.019    |
  |--------------------------------------+---------------------------|
  |                tl                env |  2.7396     2    0.254    |
  |                tl                ALL |  2.7396     2    0.254    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -37.98706                         AIC             =  11.99676
FPE            =  857.2112                         HQIC            =  11.32701
Det(Sigma_ml)  =   45.6503                         SBIC            =  12.09607

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.00008   0.7287   21.48929   0.0003
oe                   5     24.8176   0.8692    53.1837   0.0000
```

```
-----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .8532873   .3673042     2.32   0.020     .1333843     1.57319
         L2. |  -.4119522   .3711271    -1.11   0.267    -1.139348    .3154435
             |
          oe |
         L1. |   .0121393   .0108436     1.12   0.263    -.0091137    .0333924
         L2. |  -.0057109    .006362    -0.90   0.369    -.0181801    .0067583
             |
       _cons |   4.473145   3.334442     1.34   0.180    -2.062241    11.00853
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   4.511532    9.11491     0.49   0.621    -13.35336    22.37643
         L2. |   8.840099   9.209778     0.96   0.337    -9.210733    26.89093
             |
          oe |
         L1. |   .3836075   .2690912     1.43   0.154    -.1438016    .9110165
         L2. |  -.4496229   .1578763    -2.85   0.004    -.7590548   -.1401911
             |
       _cons |   218.8038   82.74651     2.64   0.008     56.62365     380.984
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  1.6438     2    0.440    |
  |               env                ALL |  1.6438     2    0.440    |
  |--------------------------------------+---------------------------|
  |                oe                env |  10.548     2    0.005    |
  |                oe                ALL |  10.548     2    0.005    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
17.log
  log type:  text
 closed on:   3 Jul 2012, 11:45:52
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
18.log
  log type:  text
 opened on:   3 Jul 2012, 11:46:44

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  19.31603                         AIC             = -2.329008
FPE            =  .0005146                         HQIC            =  -2.99876
Det(Sigma_ml)  =  .0000274                         SBIC            = -2.229706

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .055371   0.8819   59.71848   0.0000
revtot               5     .652353   0.9803   397.7622   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7252549   .2733733     2.65   0.008     .1894531    1.261057
         L2. |  -.1165468   .1846685    -0.63   0.528    -.4784904    .2453968
             |
      revtot |
         L1. |  -.0238586   .0076246    -3.13   0.002    -.0388025   -.0089147
         L2. |   .0211623   .0066098     3.20   0.001     .0082072    .0341173
             |
       _cons |   .4692894   .8913803     0.53   0.599    -1.277784    2.216363
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   -37.4015   3.220747   -11.61   0.000    -43.71405   -31.08895
         L2. |   24.05156   2.175672    11.05   0.000     19.78732     28.3158
             |
      revtot |
         L1. |   .6532411   .0898291     7.27   0.000     .4771793    .8293029
         L2. |  -1.142937   .0778739   -14.68   0.000    -1.295568   -.9903075
             |
       _cons |   101.3848    10.5018     9.65   0.000     80.80165    121.9679
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  26.403     2    0.000    |
  |               env                ALL |  26.403     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  191.04     2    0.000    |
  |            revtot                ALL |  191.04     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env cos

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood =  19.74179                        AIC             = -2.435449
FPE            =  .0004627                        HQIC            =   -3.1052
Det(Sigma_ml)  =  .0000246                        SBIC            = -2.336147

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .049893   0.9041   75.40651   0.0000
cos                   5     .605891   0.9801   393.1129   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .613417   .2514376     2.44   0.015     .1206084    1.106226
         L2. |  -.0429771   .1627832    -0.26   0.792    -.3620263    .2760721
             |
         cos |
         L1. |  -.0323707   .0092802    -3.49   0.000    -.0505597   -.0141818
         L2. |   .0293904    .007088     4.15   0.000     .0154982    .0432826
             |
       _cons |    .457718   .7193688     0.64   0.525    -.9522189    1.867655
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   -19.8047   3.053437    -6.49   0.000    -25.78933   -13.82008
         L2. |   19.52268   1.976826     9.88   0.000     15.64817    23.39718
             |
         cos |
         L1. |   1.162388   .1126984    10.31   0.000     .9415037    1.383273
         L2. |  -1.224324   .0860758   -14.22   0.000    -1.393029   -1.055618
             |
       _cons |   43.59534   8.735955     4.99   0.000     26.47318    60.71749
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  34.373     2    0.000    |
  |               env                ALL |  34.373     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  114.72     2    0.000    |
  |               cos                ALL |  114.72     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  27.54334                         AIC             = -4.385836
FPE            =  .0000658                         HQIC            = -5.055588
Det(Sigma_ml)  =  3.50e-06                         SBIC            = -4.286534

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .041677   0.9331   111.5311   0.0000
ni                   5     .444256   0.8395   41.85948   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6071347   .1303866     4.66   0.000     .3515816    .8626878
         L2. |  -.6106451   .1773036    -3.44   0.001    -.9581537   -.2631364
             |
          ni |
         L1. |  -.3298813   .0576297    -5.72   0.000    -.4428334   -.2169292
         L2. |   .0972337   .0227135     4.28   0.000      .052716    .1417514
             |
       _cons |   1.479849   .1973256     7.50   0.000     1.093098      1.8666
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -3.334575   1.389858    -2.40   0.016    -6.058648   -.6105028
         L2. |  -1.015373   1.889971    -0.54   0.591    -4.719648    2.688901
             |
          ni |
         L1. |  -.9280698   .6143048    -1.51   0.131    -2.132085    .2759455
         L2. |   .5306828   .2421152     2.19   0.028     .0561457     1.00522
             |
       _cons |   7.930392   2.103395     3.77   0.000     3.807814    12.05297
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  52.726     2    0.000    |
  |               env                ALL |  52.726     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ni                env |  11.924     2    0.003    |
  |                ni                ALL |  11.924     2    0.003    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -1.174613                         AIC             =  2.793653
FPE            =  .0863431                         HQIC            =  2.123902
Det(Sigma_ml)  =  .0045982                         SBIC            =  2.892955

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .050161   0.9030   74.51534   0.0000
curra                5     3.62018   0.2961   3.364605   0.4988
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .3358089   .2665342     1.26   0.208    -.1865885    .8582064
         L2. |  -.0773962    .174625    -0.44   0.658     -.419655    .2648625
             |
       curra |
         L1. |  -.0255508   .0045488    -5.62   0.000    -.0344663   -.0166353
         L2. |  -.0068906    .007421    -0.93   0.353    -.0214354    .0076542
             |
       _cons |    2.10923   .5284687     3.99   0.000      1.07345    3.145009
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -2.279952   19.23599    -0.12   0.906     -39.9818    35.42189
         L2. |   .4946456   12.60283     0.04   0.969    -24.20644    25.19573
             |
       curra |
         L1. |   -.093284   .3282899    -0.28   0.776    -.7367204    .5501525
         L2. |   .4573039   .5355767     0.85   0.393    -.5924071    1.507015
             |
       _cons |   32.67877   38.14001     0.86   0.392    -42.07427    107.4318
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  33.92      2    0.000    |
  |               env                ALL |  33.92      2    0.000    |
  |--------------------------------------+---------------------------|
  |             curra                env | .01622      2    0.992    |
  |             curra                ALL | .01622      2    0.992    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  4.650081                         AIC             =   1.33748
FPE            =  .0201289                         HQIC            =  .6677282
Det(Sigma_ml)  =   .001072                         SBIC            =  1.436782

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .04128   0.9343   113.8395   0.0000
asset                5     2.12638   0.7400    22.7674   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6944858   .2871486     2.42   0.016     .1316849    1.257287
         L2. |   .0181484   .2187938     0.08   0.934    -.4106796    .4469764
             |
       asset |
         L1. |  -.0246347   .0036276    -6.79   0.000    -.0317445   -.0175248
         L2. |   .0072064   .0070269     1.03   0.305    -.0065661    .0209789
             |
       _cons |   1.582934   .7450147     2.12   0.034     .1227319    3.043136
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -69.35451    14.7913    -4.69   0.000    -98.34493   -40.36409
         L2. |   52.15078   11.27028     4.63   0.000     30.06143    74.24012
             |
       asset |
         L1. |  -.2107517   .1868588    -1.13   0.259    -.5769882    .1554848
         L2. |  -1.571689   .3619633    -4.34   0.000    -2.281124   -.8622543
             |
       _cons |   232.1902   38.37643     6.05   0.000     156.9738    307.4066
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  53.898     2    0.000    |
  |               env                ALL |  53.898     2    0.000    |
  |--------------------------------------+---------------------------|
  |             asset                env |  22.664     2    0.000    |
  |             asset                ALL |  22.664     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env currl

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -.9872085                        AIC             =  2.746802
FPE            =  .0823911                        HQIC            =  2.077051
Det(Sigma_ml)  =  .0043877                        SBIC            =  2.846104

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .084804   0.7229   20.86939   0.0003
currl                5     2.36229   0.7803   28.41873   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .829286   .3766977     2.20   0.028     .0909721      1.5676
         L2. |   .0572049   .4316094     0.13   0.895     -.788734    .9031438
             |
       currl |
         L1. |  -.0168506   .0077389    -2.18   0.029    -.0320185   -.0016827
         L2. |   .0017853   .0095423     0.19   0.852    -.0169173    .0204879
             |
       _cons |   .4864039   .3459432     1.41   0.160    -.1916323     1.16444
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -4.297599   10.49325    -0.41   0.682    -24.86399    16.26879
         L2. |   33.25528   12.02287     2.77   0.006     9.690899    56.81967
             |
       currl |
         L1. |   -.166811   .2155735    -0.77   0.439    -.5893274    .2557054
         L2. |  -.2122745   .2658094    -0.80   0.425    -.7332514    .3087023
             |
       _cons |   13.08652   9.636556     1.36   0.174    -5.800786    31.97382
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  6.6666     2    0.036    |
  |               env                ALL |  6.6666     2    0.036    |
  |--------------------------------------+---------------------------|
  |             currl                env |  20.472     2    0.000    |
  |             currl                ALL |  20.472     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  1.389459                         AIC             =  2.152635
FPE            =  .0454817                         HQIC            =  1.482884
Det(Sigma_ml)  =  .0024221                         SBIC            =  2.251937

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .08024   0.7519   24.24675   0.0001
ltd                  5     2.06372   0.7159    20.1545   0.0005
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1843283   .4165741    -0.44   0.658    -1.000799     .632142
         L2. |  -.1576657   .2947482    -0.53   0.593    -.7353617    .4200302
             |
         ltd |
         L1. |   .0234132   .0089153     2.63   0.009     .0059396    .0408868
         L2. |   .0138963   .0110295     1.26   0.208    -.0077211    .0355138
             |
       _cons |   .9388185   .3179178     2.95   0.003      .315711    1.561926
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   -6.82638   10.71397    -0.64   0.524    -27.82538    14.17262
         L2. |  -2.326065   7.580702    -0.31   0.759    -17.18397    12.53184
             |
         ltd |
         L1. |    .488157    .229294     2.13   0.033     .0387489     .937565
         L2. |   .4345408   .2836707     1.53   0.126    -.1214436    .9905252
             |
       _cons |   6.099946   8.176606     0.75   0.456    -9.925907     22.1258
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  8.3824     2    0.015    |
  |               env                ALL |  8.3824     2    0.015    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  .62952     2    0.730    |
  |               ltd                ALL |  .62952     2    0.730    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env tl

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood =  4.524302                      AIC             =  1.368925
FPE            =  .0207719                      HQIC            =   .699173
Det(Sigma_ml)  =  .0011062                      SBIC            =  1.468226

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .063875   0.8428   42.88789   0.0000
tl                   5     1.59314   0.9589   186.4419   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.105343   .2932038     3.77   0.000     .5306743    1.680012
         L2. |  -.4559239   .3071221    -1.48   0.138    -1.057872    .1460243
             |
          tl |
         L1. |  -.0219313   .0075421    -2.91   0.004    -.0367136   -.0071491
         L2. |   .0258119   .0063533     4.06   0.000     .0133597    .0382642
             |
       _cons |   .0861635   .1239093     0.70   0.487    -.1566942    .3290212
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   23.41893   7.312995     3.20   0.001     9.085723    37.75214
         L2. |   20.68047   7.660142     2.70   0.007     5.666866    35.69407
             |
          tl |
         L1. |  -.3158676   .1881129    -1.68   0.093    -.6845621    .0528269
         L2. |   .4345044   .1584619     2.74   0.006     .1239249     .745084
             |
       _cons |  -7.858608   3.090506    -2.54   0.011    -13.91589   -1.801328
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  17.853     2    0.000    |
  |               env                ALL |  17.853     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  25.339     2    0.000    |
  |                tl                ALL |  25.339     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit
```

```
. var env oe

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood =  8.378723                        AIC             =  .4053193
FPE            =  .0079248                        HQIC            = -.2644323
Det(Sigma_ml)  =   .000422                        SBIC            =  .5046212

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .066167   0.8313   39.42255   0.0000
oe                   5     1.93229   0.9490   148.8304   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.413077   .7578004    -0.55   0.586    -1.898338    1.072184
         L2. |   -.256609   .3199771    -0.80   0.423    -.8837527    .3705346
             |
          oe |
         L1. |  -.0212669   .0199873    -1.06   0.287    -.0604413    .0179076
         L2. |  -.0069397   .0356935    -0.19   0.846    -.0768976    .0630182
             |
       _cons |   2.546197   1.510596     1.69   0.092    -.4145161     5.50691
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   5.046454   22.13017     0.23   0.820    -38.32788    48.42079
         L2. |  -1.455136   9.344344    -0.16   0.876    -19.76971    16.85944
             |
          oe |
         L1. |   1.036403   .5836935     1.78   0.076    -.1076148    2.180422
         L2. |    .013162   1.042362     0.01   0.990     -2.02983    2.056154
             |
       _cons |  -2.702579   44.11417    -0.06   0.951    -89.16477    83.75961
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  16.092     2    0.000    |
  |               env                ALL |  16.092     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  .19364     2    0.908    |
  |                oe                ALL |  .19364     2    0.908    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
```

```
      log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
18.log
  log type:  text
 closed on:   3 Jul 2012, 11:48:39
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
19.log
  log type:  text
 opened on:   3 Jul 2012, 11:48:48

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -43.84661                         AIC             =  13.46165
FPE            =  3709.203                         HQIC            =   12.7919
Det(Sigma_ml)  =  197.5315                         SBIC            =  13.56095

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.36284   0.7932   30.68474   0.0000
revtot               5     28.0855   0.9929   1120.207   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2931947   .3409735    -0.86   0.390    -.9614905    .3751011
         L2. |   .1544834   .3316229     0.47   0.641    -.4954854    .8044523
             |
      revtot |
         L1. |   .0116693   .0035558     3.28   0.001     .0047001    .0186386
         L2. |  -.0037187   .0042712    -0.87   0.384      -.01209    .0046526
             |
       _cons |   2.898376    1.48662     1.95   0.051    -.0153451    5.812096
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   44.74138   7.026837     6.37   0.000     30.96903    58.51373
         L2. |   41.91258   6.834137     6.13   0.000     28.51792    55.30724
             |
      revtot |
         L1. |   1.491483   .0732787    20.35   0.000     1.347859    1.635107
         L2. |  -1.666698   .0880206   -18.94   0.000    -1.839215    -1.49418
             |
       _cons |    369.688    30.6365    12.07   0.000     309.6415    429.7344
------------------------------------------------------------------------------

. est store revtotreg
```

```
. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |   11.17     2    0.004    |
  |               env                ALL |   11.17     2    0.004    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  47.224     2    0.000    |
  |            revtot                ALL |  47.224     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -33.76182                         AIC             =  10.94046
FPE            =  298.0842                         HQIC            =   10.2707
Det(Sigma_ml)  =  15.87431                         SBIC            =  11.03976

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.23161   0.8311   39.36751   0.0000
cos                  5     12.9319   0.9940   1333.863   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4460874   .3211892    -1.39   0.165    -1.075607    .1834318
         L2. |   .0619401   .3164527     0.20   0.845    -.5582958     .682176
             |
         cos |
         L1. |   .0244009   .0062034     3.93   0.000     .0122425    .0365594
         L2. |  -.0048073   .0083701    -0.57   0.566    -.0212123    .0115977
             |
       _cons |   .6820867   1.683951     0.41   0.685    -2.618397     3.98257
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   12.58434    3.37248     3.73   0.000     5.974396    19.19427
         L2. |   14.07332   3.322747     4.24   0.000     7.560859    20.58579
             |
         cos |
         L1. |   1.627181   .0651357    24.98   0.000     1.499517    1.754845
         L2. |  -1.451886   .0878854   -16.52   0.000    -1.624138   -1.279634
             |
       _cons |   274.5452   17.68145    15.53   0.000     239.8902    309.2002
------------------------------------------------------------------------------

. est store cosreg
```

```
. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |           Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |                env                cos |  15.473     2    0.000    |
  |                env                ALL |  15.473     2    0.000    |
  |--------------------------------------+---------------------------|
  |                cos                env |  19.324     2    0.000    |
  |                cos                ALL |  19.324     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -34.92536                         AIC             =  11.23134
FPE            =  398.7207                         HQIC            =  10.56159
Det(Sigma_ml)  =  21.23365                         SBIC            =  11.33064

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.59787   0.7157   20.14114   0.0005
ni                   5     8.21653   0.9839   490.1096   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0564193   .3552388    -0.16   0.874    -.7526745    .6398359
         L2. |   .2763293   .3436786     0.80   0.421    -.3972683    .9499269
             |
          ni |
         L1. |   .0537762   .0240389     2.24   0.025     .0066608    .1008916
         L2. |  -.0311911   .0223667    -1.39   0.163    -.0750291    .0126469
             |
       _cons |   5.149949   2.832761     1.82   0.069    -.4021607    10.70206
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |    12.1868   1.826696     6.67   0.000     8.606543    15.76706
         L2. |   9.020633   1.767251     5.10   0.000     5.556884    12.48438
             |
          ni |
         L1. |   1.327314    .123612    10.74   0.000     1.085039    1.569589
         L2. |  -1.826777   .1150134   -15.88   0.000    -2.052199   -1.601355
             |
       _cons |  -42.53259   14.56652    -2.92   0.004    -71.08245   -13.98274
------------------------------------------------------------------------------

. est store nireg
```

```
. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  5.9452     2    0.051    |
  |               env                ALL |  5.9452     2    0.051    |
  |--------------------------------------+---------------------------|
  |                ni                env |  46.726     2    0.000    |
  |                ni                ALL |  46.726     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -48.40717                         AIC             =  14.60179
FPE            =  11599.44                         HQIC            =  13.93204
Det(Sigma_ml)  =  617.7217                         SBIC            =  14.70109

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.69434   0.6804   17.02788   0.0019
curra                5     58.4553   0.9139   84.93875   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0733377   .3192634    -0.23   0.818    -.6990825    .5524071
         L2. |   .2960416   .3225761     0.92   0.359    -.3361958    .9282791
             |
       curra |
         L1. |   .0088681   .0042714     2.08   0.038     .0004964    .0172399
         L2. |   .0000259   .0070432     0.00   0.997    -.0137785    .0138303
             |
       _cons |   .5843025   2.626186     0.22   0.824    -4.562928    5.731533
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   47.56748   11.01468     4.32   0.000     25.97911    69.15585
         L2. |   50.19188   11.12896     4.51   0.000     28.37951    72.00424
             |
       curra |
         L1. |   .7816415   .1473638     5.30   0.000     .4928137    1.070469
         L2. |  -1.557699   .2429923    -6.41   0.000    -2.033955   -1.081443
             |
       _cons |   594.0099   90.60414     6.56   0.000     416.4291    771.5908
------------------------------------------------------------------------------

. est store currareg
```

```
. vargranger, estimates (curraregr)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |           Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |                env              curra |  4.4024     2    0.111    |
  |                env                ALL |  4.4024     2    0.111    |
  |--------------------------------------+---------------------------|
  |              curra                env |  27.403     2    0.000    |
  |              curra                ALL |  27.403     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                                No. of obs      =         8
Log likelihood = -52.72961                          AIC             =   15.6824
FPE            =  34177.53                          HQIC            =  15.01265
Det(Sigma_ml)  =  1820.105                          SBIC            =  15.78171

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.55553   0.7306   21.69414   0.0002
asset                5     130.407   0.8521   46.09489   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4648918   .4018699    -1.16   0.247    -1.252542    .3227587
         L2. |  -.0145069   .3809028    -0.04   0.970    -.7610626    .7320489
             |
       asset |
         L1. |   .0090419   .0035445     2.55   0.011     .0020949     .015989
         L2. |   .0016155   .0048298     0.33   0.738    -.0078508    .0110817
             |
       _cons |  -2.150242   3.203281    -0.67   0.502    -8.428558    4.128074
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   76.39695   33.69058     2.27   0.023     10.36463    142.4293
         L2. |   81.53229   31.93281     2.55   0.011     18.94513    144.1195
             |
       asset |
         L1. |   .5876074    .297149     1.98   0.048      .005206    1.170009
         L2. |  -1.082298   .4049051    -2.67   0.008    -1.875897   -.2886986
             |
       _cons |    905.516   268.5456     3.37   0.001     379.1762    1431.856
------------------------------------------------------------------------------

. est store assetreg
```

```
. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |           Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |                env              asset |  6.7148     2    0.035    |
  |                env                ALL |  6.7148     2    0.035    |
  |--------------------------------------+---------------------------|
  |              asset                env |  7.1248     2    0.028    |
  |              asset                ALL |  7.1248     2    0.028    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -51.28832                         AIC             =  15.32208
FPE            =  23837.12                         HQIC            =  14.65233
Det(Sigma_ml)  =  1269.432                         SBIC            =  15.42138

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.89304   0.6010   12.04968   0.0170
currl                5     51.5423   0.7901   30.11397   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2307477   .2223295     1.04   0.299    -.2050102    .6665055
         L2. |   .4688862   .2432835     1.93   0.054    -.0079407    .9457132
             |
       currl |
         L1. |   .0095527    .006867     1.39   0.164    -.0039063    .0230118
         L2. |  -.0016076   .0137459    -0.12   0.907     -.028549    .0253338
             |
       _cons |   1.054667   4.229168     0.25   0.803    -7.234351    9.343684
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   7.422561   6.053422     1.23   0.220    -4.441928    19.28705
         L2. |   .3522822   6.623943     0.05   0.958    -12.63041    13.33497
             |
       currl |
         L1. |   .5580437   .1869696     2.98   0.003       .19159    .9244974
         L2. |  -1.592217   .3742623    -4.25   0.000    -2.325757    -.858676
             |
       _cons |   617.7527   115.1486     5.36   0.000     392.0655    843.4398
------------------------------------------------------------------------------

. est store currlreg
```

```
. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  1.9355     2    0.380    |
  |               env                ALL |  1.9355     2    0.380    |
  |--------------------------------------+---------------------------|
  |             currl                env |  1.6825     2    0.431    |
  |             currl                ALL |  1.6825     2    0.431    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -34.38064                         AIC             =  11.09516
FPE            =  347.9571                         HQIC            =  10.42541
Det(Sigma_ml)  =  18.53026                         SBIC            =  11.19446

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     2.09708   0.5103   8.337895   0.0800
ltd                  5     9.12994   0.9730   287.9737   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .181281   .3202504     0.57   0.571    -.4463981    .8089602
         L2. |   .4391068   .4941816     0.89   0.374    -.5294714    1.407685
             |
         ltd |
         L1. |    .002627   .0436706     0.06   0.952    -.0829657    .0882197
         L2. |  -.0084585   .0284313    -0.30   0.766    -.0641828    .0472658
             |
       _cons |   4.809932    7.73137     0.62   0.534    -10.34328    19.96314
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -11.66706   1.394256    -8.37   0.000    -14.39976   -8.934374
         L2. |  -3.508134    2.15149    -1.63   0.103    -7.724977    .7087089
             |
         ltd |
         L1. |   .4094695    .190126     2.15   0.031     .0368293    .7821096
         L2. |  -.3419573   .1237797    -2.76   0.006    -.5845611   -.0993535
             |
       _cons |   189.4767   33.65962     5.63   0.000     123.5051    255.4484
------------------------------------------------------------------------------

. est store ltdreg
```

```
. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  .09616     2    0.953    |
  |               env                ALL |  .09616     2    0.953    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  70.554     2    0.000    |
  |               ltd                ALL |  70.554     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -51.72565                         AIC             =  15.43141
FPE            =  26591.14                         HQIC            =  14.76166
Det(Sigma_ml)  =  1416.096                         SBIC            =  15.53072

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.82082   0.6309   13.6716   0.0084
tl                   5     56.1641   0.7985   31.71079  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2086434   .2138031     0.98   0.329     -.210403    .6276898
         L2. |   .6179883    .239075     2.58   0.010       .14941    1.086567
             |
          tl |
         L1. |   .0120885   .0075822     1.59   0.111    -.0027724    .0269493
         L2. |  -.0139871   .0150461    -0.93   0.353    -.0434768    .0155026
             |
       _cons |   3.786512   7.544686     0.50   0.616     -11.0008    18.57383
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -14.74524   6.594859    -2.24   0.025    -27.67093   -1.819557
         L2. |  -6.003921   7.374381    -0.81   0.416    -20.45744    8.449601
             |
          tl |
         L1. |     .71432    .233877     3.05   0.002     .2559296     1.17271
         L2. |  -1.218742   .4641026    -2.63   0.009    -2.128367   -.3091179
             |
       _cons |    864.592   232.7194     3.72   0.000     408.4703    1320.714
------------------------------------------------------------------------------

. est store tlreg
```

```
. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  2.7393     2    0.254    |
  |               env                ALL |  2.7393     2    0.254    |
  |--------------------------------------+---------------------------|
  |                tl                env |  9.4803     2    0.009    |
  |                tl                ALL |  9.4803     2    0.009    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -48.26083                         AIC             =  14.56521
FPE            =  11182.74                         HQIC            =  13.89546
Det(Sigma_ml)  =  595.5305                         SBIC            =  14.66451

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.47196   0.7588   25.16174   0.0000
oe                   5     99.1196   0.9320   109.6476   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8507234   .4635193    -1.84   0.066    -1.759205    .0577578
         L2. |  -.3133578   .3904001    -0.80   0.422    -1.078528    .4518124
             |
          oe |
         L1. |    .016667   .0059257     2.81   0.005     .0050528    .0282813
         L2. |  -.0014121   .0050234    -0.28   0.779    -.0112579    .0084336
             |
       _cons |   3.351853   1.672314     2.00   0.045     .0741766    6.629529
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   42.29124   31.21279     1.35   0.175    -18.88471    103.4672
         L2. |   45.32417   26.28904     1.72   0.085    -6.201402    96.84974
             |
          oe |
         L1. |   .7354184   .3990316     1.84   0.065    -.0466693    1.517506
         L2. |  -.4906659   .3382709    -1.45   0.147    -1.153665     .172333
             |
       _cons |   94.67512   112.6115     0.84   0.401    -126.0394    315.3896
------------------------------------------------------------------------------

. est store oereg
```

```
. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  8.4331     2    0.015    |
  |               env                ALL |  8.4331     2    0.015    |
  |--------------------------------------+---------------------------|
  |                oe                env |  2.9836     2    0.225    |
  |                oe                ALL |  2.9836     2    0.225    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
19.log
  log type:  text
 closed on:   3 Jul 2012, 11:51:09
-------------------------------------------------------------------------------
name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/Granger Test/firm
>  20.log
  log type:  text
 opened on:   8 Jul 2012, 19:27:13

. edit

. *(12 variables, 0 observation pasted into data editor)

. *(12 variables, 10 observations pasted into data editor)

. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -15.8259                         AIC             =  6.456474
FPE            =  3.364887                         HQIC            =  5.786723
Det(Sigma_ml)  =  .1791952                         SBIC            =  6.555776

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .214726   0.5779   10.95145   0.0271
revtot               5     9.87917   0.8122   34.60669   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5786762   .3932164    -1.47   0.141    -1.349366    .1920137
         L2. |  -.2598992   .7664261    -0.34   0.735    -1.762067    1.242268
             |
```

```
      revtot |
         L1. |  -.0016821    .006971    -0.24   0.809    -.0153449    .0119808
         L2. |   .0153441   .0087999     1.74   0.081    -.0019034    .0325916
             |
       _cons |  -.5194254    .381336    -1.36   0.173     -1.26683    .2279794
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -11.37476   18.09122    -0.63   0.530    -46.83289    24.08337
         L2. |  -37.65735   35.26196    -1.07   0.286    -106.7695    31.45483
             |
      revtot |
         L1. |   .9138265   .3207233     2.85   0.004     .2852204    1.542432
         L2. |  -.4596396   .4048693    -1.14   0.256    -1.253169    .3338896
             |
       _cons |   64.55687   17.54462     3.68   0.000     30.17005     98.9437
------------------------------------------------------------------------------

. . est store revtotreg

. . vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  10.237     2    0.006    |
  |               env                ALL |  10.237     2    0.006    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  1.1406     2    0.565    |
  |            revtot                ALL |  1.1406     2    0.565    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -12.63104                         AIC             =   5.65776
FPE            =  1.513886                         HQIC            =  4.988008
Det(Sigma_ml)  =  .0806211                         SBIC            =  5.757062

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .215872   0.5733   10.75068   0.0295
cos                  5      5.3307   0.8830   60.35504   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5595203   .3635583    -1.54   0.124    -1.272082    .1530408
         L2. |  -.1490043   .7019575    -0.21   0.832    -1.524816    1.226807
```

```
             |
         cos |
         L1. |   .0000534    .009689     0.01   0.996    -.0189367    .0190436
         L2. |   .0201081   .0125668     1.60   0.110    -.0045225    .0447386
             |
       _cons |  -.5803815   .3590438    -1.62   0.106    -1.284094    .1233313
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -9.993184   8.977623    -1.11   0.266      -27.589    7.602633
         L2. |  -27.38475   17.33397    -1.58   0.114    -61.35871    6.589216
             |
         cos |
         L1. |   1.037562   .2392586     4.34   0.000     .5686235      1.5065
         L2. |  -.5004412   .3103226    -1.61   0.107    -1.108662    .1077799
             |
       _cons |   40.72923   8.866142     4.59   0.000     23.35191    58.10655
------------------------------------------------------------------------------

. . est store cosreg

. . vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  10.044     2    0.007    |
  |               env                ALL |  10.044     2    0.007    |
  |--------------------------------------+---------------------------|
  |               cos                env |  2.6198     2    0.270    |
  |               cos                ALL |  2.6198     2    0.270    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -6.02083                         AIC             =  4.005207
FPE            =  .2900005                         HQIC            =  3.335456
Det(Sigma_ml)  =  .0154438                         SBIC            =  4.104509

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .206758   0.6086   12.44032   0.0144
ni                   5     2.76309   0.5851    11.2809   0.0236
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.139189    .612838    -1.86   0.063    -2.340329    .0619517
```

```
          L2. |  -2.08227   1.397872    -1.49   0.136    -4.822049     .657508
              |
           ni |
          L1. | -.1048935   .0639299    -1.64   0.101    -.2301938    .0204067
          L2. |  .1649558   .0632723     2.61   0.009     .0409445    .2889672
              |
        _cons |   1.15692    .648962     1.78   0.075    -.1150223    2.428862
-------------+----------------------------------------------------------------
ni           |
          env |
          L1. |  2.650324   8.189898     0.32   0.746    -13.40158    18.70223
          L2. |  5.306226     18.681     0.28   0.776    -31.30786    41.92031
              |
           ni |
          L1. |  .9870342   .8543515     1.16   0.248    -.6874639    2.661532
          L2. | -.9943165   .8455634    -1.18   0.240     -2.65159    .6629572
              |
        _cons |  1.893951   8.672655     0.22   0.827    -15.10414    18.89204
------------------------------------------------------------------------------

. . est store nireg

. . vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  11.67     2    0.003     |
  |               env                ALL |  11.67     2    0.003     |
  |--------------------------------------+---------------------------|
  |                ni                env | .10472     2    0.949     |
  |                ni                ALL | .10472     2    0.949     |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -11.22129                         AIC             =  5.305322
FPE            =   1.06422                         HQIC            =   4.63557
Det(Sigma_ml)  =  .0566744                         SBIC            =  5.404624

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .16668   0.7456   23.45184   0.0001
curra                5     6.87956   0.6749   16.60946   0.0023
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
          env |
```

```
         L1. |  -.8897656   .3231755    -2.75   0.006    -1.523178   -.2563532
         L2. |   -.603039   .5880377    -1.03   0.305    -1.755572    .5494937
             |
       curra |
         L1. |  -.0131606     .00967    -1.36   0.174    -.0321135    .0057922
         L2. |   .0381504   .0117912     3.24   0.001     .0150402    .0612607
             |
       _cons |   -.566626   .3250336    -1.74   0.081     -1.20368    .0704282
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   8.415009    13.3388     0.63   0.528    -17.72855    34.55857
         L2. |  -20.12005   24.27075    -0.83   0.407    -67.68985    27.44976
             |
       curra |
         L1. |    .835858   .3991204     2.09   0.036     .0535964     1.61812
         L2. |   -.446665   .4866703    -0.92   0.359    -1.400521    .5071913
             |
       _cons |   40.91799   13.41548     3.05   0.002     14.62412    67.21186
------------------------------------------------------------------------------

. . est store currareg

. . vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  22.266     2    0.000    |
  |               env                ALL |  22.266     2    0.000    |
  |--------------------------------------+---------------------------|
  |             curra                env |     2.7     2    0.259    |
  |             curra                ALL |     2.7     2    0.259    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -13.71427                         AIC             =  5.928567
FPE            =  1.984739                         HQIC            =  5.258816
Det(Sigma_ml)  =  .1056961                         SBIC            =  6.027869

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .170513   0.7338   22.05371   0.0002
asset                5     6.71034   0.8251    37.7316   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.9864828   .3841622    -2.57   0.010    -1.739427   -.2335387
         L2. |  -.5377373   .5764479    -0.93   0.351    -1.667554    .5920798
             |
       asset |
         L1. |  -.0089194   .0081965    -1.09   0.277    -.0249842    .0071455
         L2. |   .0315439   .0108958     2.90   0.004     .0101884    .0528993
             |
       _cons |  -1.090586   .3679285    -2.96   0.003    -1.811713   -.3694592
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   35.60119   15.11828     2.35   0.019     5.969904    65.23247
         L2. |   1.561177   22.68547     0.07   0.945    -42.90153    46.02388
             |
       asset |
         L1. |   1.461994   .3225643     4.53   0.000     .8297794    2.094208
         L2. |  -1.299703   .4287937    -3.03   0.002    -2.140123   -.4592824
             |
       _cons |   61.83809   14.47942     4.27   0.000     33.45894    90.21723
------------------------------------------------------------------------------

. . est store assetreg

. . vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  20.921     2    0.000    |
  |               env                ALL |  20.921     2    0.000    |
  |--------------------------------------+---------------------------|
  |             asset                env |  8.6552     2    0.013    |
  |             asset                ALL |  8.6552     2    0.013    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -11.78976                         AIC             =  5.447441
FPE            =  1.226741                         HQIC            =  4.777689
Det(Sigma_ml)  =  .0653294                         SBIC            =  5.546743

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .305514   0.1454   1.361578   0.8508
currl                5     5.63925   0.6676   16.06501   0.0029
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
env          |
         env |
         L1. |  -.6780352   .8060507    -0.84   0.400    -2.257866    .9017951
         L2. |   .0740649   .9070841     0.08   0.935    -1.703787    1.851917
             |
       currl |
         L1. |   -.037592   .0376198    -1.00   0.318    -.1113254    .0361415
         L2. |   .0049527   .0275927     0.18   0.858     -.049128    .0590335
             |
       _cons |   1.622647   1.733745     0.94   0.349     -1.77543    5.020725
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -8.169821   14.87828    -0.55   0.583    -37.33072    20.99108
         L2. |  -16.82506   16.74318    -1.00   0.315    -49.64109    15.99097
             |
       currl |
         L1. |   .6746915   .6943955     0.97   0.331    -.6862986    2.035682
         L2. |  -.0650627   .5093135    -0.13   0.898    -1.063299    .9331734
             |
       _cons |   19.09284   32.00189     0.60   0.551    -43.62972     81.8154
------------------------------------------------------------------------------

. . est store currlreg

. . vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  1.0086     2    0.604    |
  |               env                ALL |  1.0086     2    0.604    |
  |--------------------------------------+---------------------------|
  |             currl                env |   1.128     2    0.569    |
  |             currl                ALL |   1.128     2    0.569    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -4.005885                         AIC             =  3.501471
FPE            =  .1752383                         HQIC            =   2.83172
Det(Sigma_ml)  =  .0093322                         SBIC            =  3.600773

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .300837   0.1714   1.654903   0.7989
ltd                  5     .926596   0.7528   24.35714   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0272289   .3769203    -0.07   0.942    -.7659792    .7115214
         L2. |   .5143953   .7399752     0.70   0.487    -.9359295     1.96472
             |
         ltd |
         L1. |  -.0202102   .0786785    -0.26   0.797    -.1744173    .1339968
         L2. |   .0853368   .0758594     1.12   0.261    -.0633448    .2340184
             |
       _cons |   .1163884   .3541741     0.33   0.742      -.57778    .8105568
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -1.121258   1.160937    -0.97   0.334    -3.396652    1.154136
         L2. |  -2.887226   2.279167    -1.27   0.205    -7.354311    1.579859
             |
         ltd |
         L1. |   .6052108   .2423344     2.50   0.013     .1302442    1.080177
         L2. |  -.8816098   .2336513    -3.77   0.000    -1.339558   -.4236617
             |
       _cons |   3.171855   1.090877     2.91   0.004     1.033776    5.309934
------------------------------------------------------------------------------

. . est store ltdreg

. . vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  1.2909     2    0.524    |
  |               env                ALL |  1.2909     2    0.524    |
  |--------------------------------------+---------------------------|
  |               ltd                env |   2.372     2    0.305    |
  |               ltd                ALL |   2.372     2    0.305    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env liab

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -15.33676                         AIC             =  6.334191
FPE            =  2.977581                         HQIC            =   5.66444
Det(Sigma_ml)  =  .1585694                         SBIC            =  6.433493

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .315099   0.0910   .8007139   0.9384
liab                 5     6.67679   0.6253   13.34861   0.0097
----------------------------------------------------------------

------------------------------------------------------------------------------
```

```
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.319308   .6955449    -0.46   0.646    -1.682551    1.043935
         L2. |   .1813062   .8720826     0.21   0.835    -1.527944    1.890557
             |
        liab |
         L1. |  -.0183544   .0292422    -0.63   0.530     -.075668    .0389593
         L2. |   .0090254   .0213696     0.42   0.673    -.0328583     .050909
             |
       _cons |   .7422915   1.360697     0.55   0.585    -1.924626    3.409209
-------------+----------------------------------------------------------------
liab         |
         env |
         L1. |   -13.0499   14.73826    -0.89   0.376    -41.93636    15.83657
         L2. |  -13.38003   18.47901    -0.72   0.469    -49.59823    22.83817
             |
        liab |
         L1. |   .5523879   .6196284     0.89   0.373    -.6620615    1.766837
         L2. |  -.3352564   .4528117    -0.74   0.459    -1.222751    .5522381
             |
       _cons |   34.92566   28.83252     1.21   0.226    -21.58504    91.43635
------------------------------------------------------------------------------

. . est store liabreg

. . vargranger, estimates (liabreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env               liab |  .46892     2    0.791    |
  |               env                ALL |  .46892     2    0.791    |
  |--------------------------------------+---------------------------|
  |              liab                env |  1.0874     2    0.581    |
  |              liab                ALL |  1.0874     2    0.581    |
  +------------------------------------------------------------------+

.
. . tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. . var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -4.812202                         AIC             =  3.703051
FPE            =  .2143748                         HQIC            =  3.033299
Det(Sigma_ml)  =  .0114164                         SBIC            =  3.802352

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .105596   0.8979   70.3636   0.0000
oe                   5     4.83674   0.9039   75.22182   0.0000
----------------------------------------------------------------
```

```
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.984812   .3757903    -5.28   0.000    -2.721347   -1.248276
         L2. |  -.6999184   .3768668    -1.86   0.063    -1.438564     .038727
             |
          oe |
         L1. |  -.0365153   .0119432    -3.06   0.002    -.0599236   -.0131071
         L2. |   .0719329   .0157868     4.56   0.000     .0409912    .1028745
             |
       _cons |  -.3966568   .1577975    -2.51   0.012    -.7059342   -.0873795
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   31.84782   17.21273     1.85   0.064    -1.888503    65.58414
         L2. |   -1.47991   17.26204    -0.09   0.932    -35.31288    32.35306
             |
          oe |
         L1. |   1.850728   .5470477     3.38   0.001     .7785343    2.922922
         L2. |  -1.418516   .7231011    -1.96   0.050    -2.835768   -.0012643
             |
       _cons |   18.78595   7.227766     2.60   0.009     4.619792    32.95211
------------------------------------------------------------------------------

. . est store oereg

. . vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  67.409     2    0.000    |
  |               env                ALL |  67.409     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  6.9252     2    0.031    |
  |                oe                ALL |  6.9252     2    0.031    |
  +------------------------------------------------------------------+

.
. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/Granger Test/firm
>  20.log
  log type:  text
 closed on:   8 Jul 2012, 19:29:31
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
21.log
  log type:  text
 opened on:   3 Jul 2012, 12:03:02

. *(12 variables, 10 observations pasted into data editor)

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -50.28206                         AIC             =  15.07051
FPE            =  18535.33                         HQIC            =  14.40076
Det(Sigma_ml)  =  987.0888                         SBIC            =  15.16982

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.75327   0.9711   268.5371   0.0000
revtot               5     102.398   0.7521   24.26629   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -2.932525   .5960033    -4.92   0.000     -4.10067    -1.76438
         L2. |  -.3273699   .9124653    -0.36   0.720    -2.115769    1.461029
             |
      revtot |
         L1. |  -.0041779   .0084655    -0.49   0.622      -.02077    .0124142
         L2. |   .0935283   .0296771     3.15   0.002     .0353623    .1516942
             |
       _cons |  -45.32634   10.64788    -4.26   0.000     -66.1958   -24.45688
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -56.67748     34.809    -1.63   0.103    -124.9019    11.54692
         L2. |   24.68393   53.29167     0.46   0.643    -79.76582    129.1337
             |
      revtot |
         L1. |   1.367347   .4944198     2.77   0.006     .3983016    2.336391
         L2. |  -.1439961    1.73326    -0.08   0.934    -3.541124    3.253132
             |
       _cons |   32.15585   621.8793     0.05   0.959    -1186.705    1251.017
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  24.903     2    0.000    |
  |               env                ALL |  24.903     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  15.157     2    0.001    |
  |            revtot                ALL |  15.157     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -49.71949                         AIC             =  14.92987
FPE            =   16103.5                         HQIC            =  14.26012
Det(Sigma_ml)  =  857.5829                         SBIC            =  15.02917

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.63262   0.9749   310.9193   0.0000
cos                  5     73.1733   0.8316   39.50504   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -2.739962   .4760406    -5.76   0.000    -3.672985    -1.80694
         L2. |  -.6822052   .9480183    -0.72   0.472    -2.540287    1.175876
             |
         cos |
         L1. |  -.0038709   .0098044    -0.39   0.693    -.0230872    .0153454
         L2. |   .1085831   .0319708     3.40   0.001     .0459215    .1712446
             |
       _cons |  -38.66389   8.091468    -4.78   0.000    -54.52287    -22.8049
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -65.94131   21.33589    -3.09   0.002    -107.7589   -24.12373
         L2. |   1.257155   42.48969     0.03   0.976     -82.0211    84.53541
             |
         cos |
         L1. |   1.409161    .439429     3.21   0.001     .5478963    2.270427
         L2. |   .5369436   1.432914     0.37   0.708    -2.271516    3.345403
             |
       _cons |  -207.4756   362.6554    -0.57   0.567    -918.2672    503.3159
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  29.946     2    0.000    |
  |               env                ALL |  29.946     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  25.621     2    0.000    |
  |               cos                ALL |  25.621     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -46.30145                         AIC             =  14.07536
FPE            =  6851.901                         HQIC            =  13.40561
Det(Sigma_ml)  =  364.8941                         SBIC            =  14.17466

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.01276   0.9146   85.65345   0.0000
ni                   5     20.6026   0.6123   12.63332   0.0132
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7861785   .3212307    -2.45   0.014    -1.415779    -.156578
         L2. |   2.586628   .3982694     6.49   0.000     1.806034    3.367222
             |
          ni |
         L1. |   .0574497   .0536707     1.07   0.284    -.0477429    .1626423
         L2. |   .0490145   .0447282     1.10   0.273    -.0386511    .1366801
             |
       _cons |  -2.709453   2.598392    -1.04   0.297    -7.802207    2.383302
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -6.285621    2.19672    -2.86   0.004    -10.59111   -1.980129
         L2. |   2.598694   2.723546     0.95   0.340    -2.739358    7.936745
             |
          ni |
         L1. |   .3734947   .3670244     1.02   0.309    -.3458599    1.092849
         L2. |   .0341531   .3058713     0.11   0.911    -.5653437    .6336498
             |
       _cons |   28.18155   17.76897     1.59   0.113       -6.645     63.0081
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  3.1431     2    0.208    |
  |               env                ALL |  3.1431     2    0.208    |
  |--------------------------------------+---------------------------|
  |                ni                env |  8.2103     2    0.016    |
  |                ni                ALL |  8.2103     2    0.016    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.35418                         AIC             =  12.08855
FPE            =  939.6102                         HQIC            =  11.41879
Det(Sigma_ml)  =  50.03841                         SBIC            =  12.18785

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      2.1331   0.9572   178.823   0.0000
curra                5     11.1154   0.9392   123.663   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.6343102   .2737764    -2.32   0.021    -1.170902   -.0977183
         L2. |   2.007598   .1920171    10.46   0.000     1.631252    2.383945
             |
       curra |
         L1. |   .0792068   .0216735     3.65   0.000     .0367276     .121686
         L2. |  -.0230114   .0326828    -0.70   0.481    -.0870685    .0410456
             |
       _cons |  -16.95772   7.956232    -2.13   0.033    -32.55165   -1.363794
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   8.557843   1.426623     6.00   0.000     5.761713    11.35397
         L2. |  -2.155254   1.000583    -2.15   0.031     -4.11636   -.1941471
             |
       curra |
         L1. |   1.044633   .1129384     9.25   0.000     .8232779    1.265988
         L2. |  -1.146775   .1703069    -6.73   0.000    -1.480571     -.81298
             |
       _cons |   305.9095   41.45918     7.38   0.000      224.651     387.168
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  14.229     2    0.001    |
  |               env                ALL |  14.229     2    0.001    |
  |--------------------------------------+---------------------------|
  |             curra                env |  41.961     2    0.000    |
  |             curra                ALL |  41.961     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.74102                         AIC             =  10.18526
FPE            =  140.0746                         HQIC            =  9.515504
Det(Sigma_ml)  =  7.459595                         SBIC            =  10.28456

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     2.34177   0.9484    147.012   0.0000
asset                5     3.47739   0.9970   2686.297   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3143125   .2255305    -1.39   0.163    -.7563442    .1277192
         L2. |   2.213368   .1949819    11.35   0.000     1.831211    2.595526
             |
       asset |
         L1. |   .0468793   .0159833     2.93   0.003     .0155527    .0782059
         L2. |   -.038601   .0169152    -2.28   0.022    -.0717542   -.0054477
             |
       _cons |  -10.16838   18.25671    -0.56   0.578    -45.95088    25.61412
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   7.042738   .3348998    21.03   0.000     6.386346    7.699129
         L2. |  -8.749935   .2895369   -30.22   0.000    -9.317417   -8.182453
             |
       asset |
         L1. |   .7525934   .0237342    31.71   0.000     .7060752    .7991116
         L2. |  -.9258491   .0251182   -36.86   0.000    -.9750798   -.8766185
             |
       _cons |   1159.189   27.11016    42.76   0.000     1106.054    1212.324
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  10.444     2    0.005    |
  |               env                ALL |  10.444     2    0.005    |
  |--------------------------------------+---------------------------|
  |             asset                env |  999.07     2    0.000    |
  |             asset                ALL |  999.07     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -45.00536                         AIC             =  13.75134
FPE            =  4955.538                         HQIC            =  13.08159
Det(Sigma_ml)  =  263.9044                         SBIC            =  13.85064

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.36403   0.8935   67.11612   0.0000
currl                5     18.6319   0.8641   50.87768   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5104141   .2874057    -1.78   0.076    -1.073719    .0528907
         L2. |   2.091785   .2987662     7.00   0.000     1.506214    2.677356
             |
       currl |
         L1. |  -.0055223   .0204309    -0.27   0.787    -.0455661    .0345215
         L2. |  -.0147402   .0166567    -0.88   0.376    -.0473867    .0179062
             |
       _cons |   7.674071   11.01435     0.70   0.486    -13.91365    29.26179
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   -2.11803   1.591811    -1.33   0.183    -5.237923    1.001863
         L2. |  -10.43982   1.654732    -6.31   0.000    -13.68304   -7.196605
             |
       currl |
         L1. |  -.3756823   .1131575    -3.32   0.001     -.597467   -.1538976
         L2. |   -.171591   .0922538    -1.86   0.063    -.3524051    .0092232
             |
       _cons |   664.5497   61.00354    10.89   0.000      544.985    784.1145
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  .9375      2    0.626    |
  |               env                ALL |  .9375      2    0.626    |
  |--------------------------------------+---------------------------|
  |             currl                env |  50.071     2    0.000    |
  |             currl                ALL |  50.071     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -48.44322                         AIC             =   14.6108
FPE            =  11704.45                         HQIC            =  13.94105
Det(Sigma_ml)  =   623.314                         SBIC            =  14.71011

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.91047   0.9657   224.9012   0.0000
ltd                  5      44.7318   0.3988   5.306111   0.2573
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.044434   .2092695    -4.99   0.000    -1.454595   -.6342736
         L2. |   1.791675   .1813973     9.88   0.000     1.436143    2.147207
             |
         ltd |
         L1. |  -.0483237   .0150421    -3.21   0.001    -.0778058   -.0188417
         L2. |  -.0485699   .0163496    -2.97   0.003    -.0806145   -.0165253
             |
       _cons |   29.65519   7.136366     4.16   0.000     15.66817    43.64221
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   .0033006   4.899837     0.00   0.999    -9.600204    9.606805
         L2. |   1.003356   4.247236     0.24   0.813    -7.321074    9.327786
             |
         ltd |
         L1. |   .3146226   .3521964     0.89   0.372    -.3756697    1.004915
         L2. |   .4466498   .3828096     1.17   0.243    -.3036432    1.196943
             |
       _cons |   44.57093   167.0909     0.27   0.790    -282.9212    372.0631
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  19.711     2    0.000    |
  |               env                ALL |  19.711     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  .05601     2    0.972    |
  |               ltd                ALL |  .05601     2    0.972    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =          8
Log likelihood = -43.45572                         AIC             =   13.36393
FPE            =  3363.879                         HQIC            =   12.69418
Det(Sigma_ml)  =  179.1415                         SBIC            =   13.46323

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     2.96893   0.9170   88.43904   0.0000
tl                   5     15.3374   0.9410   127.6689   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5413593    .254059    -2.13   0.033    -1.039306   -.0434128
         L2. |   2.111456    .301417     7.01   0.000      1.52069    2.702223
             |
          tl |
         L1. |   .0155392   .0304578     0.51   0.610     -.044157    .0752355
         L2. |  -.0335386   .0195105    -1.72   0.086    -.0717786    .0047013
             |
       _cons |   13.48999   18.82683     0.72   0.474    -23.40993     50.3899
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   -2.94866   1.312458    -2.25   0.025     -5.52103   -.3762904
         L2. |  -10.22975   1.557107    -6.57   0.000    -13.28163   -7.177877
             |
          tl |
         L1. |   .3557125   .1573437     2.26   0.024     .0473244    .6641006
         L2. |  -.2818565   .1007906    -2.80   0.005    -.4794024   -.0843106
             |
       _cons |   741.1589    97.2586     7.62   0.000     550.5355    931.7822
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  3.4746     2    0.176    |
  |               env                ALL |  3.4746     2    0.176    |
  |--------------------------------------+---------------------------|
  |                tl                env |  56.673     2    0.000    |
  |                tl                ALL |  56.673     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
```

```
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -34.77234                         AIC             =  11.19308
FPE            =  383.7553                         HQIC            =  10.52333
Det(Sigma_ml)  =  20.43667                         SBIC            =  11.29239

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .994394   0.9907   851.6787   0.0000
oe                   5     14.5184   0.9103   81.21227   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2983973   .2583777    -1.15   0.248    -.8048084    .2080138
         L2. |   1.817763   .0973899    18.66   0.000     1.626882    2.008644
             |
          oe |
         L1. |   .1218667   .0200681     6.07   0.000     .0825339    .1611994
         L2. |  -.0724588   .0312865    -2.32   0.021    -.1337792   -.0111384
             |
       _cons |  -13.53602   2.080037    -6.51   0.000    -17.61282   -9.459222
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -12.53088   3.772371    -3.32   0.001    -19.92459   -5.137172
         L2. |  -2.370115   1.421914    -1.67   0.096    -5.157015    .4167841
             |
          oe |
         L1. |  -.4886211   .2929984    -1.67   0.095    -1.062887    .0856452
         L2. |   1.909674   .4567893     4.18   0.000     1.014384    2.804965
             |
       _cons |   22.56454   30.36899     0.74   0.457    -36.95759    82.08666
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  94.287     2    0.000    |
  |               env                ALL |  94.287     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  11.921     2    0.003    |
  |                oe                ALL |  11.921     2    0.003    |
  +------------------------------------------------------------------+

. log close
```

```
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
21.log
  log type:  text
 closed on:   3 Jul 2012, 12:05:34
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
22.log
  log type:  text
 opened on:   3 Jul 2012, 12:05:41

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -57.18156                         AIC             =  16.79539
FPE            =  104016.9                         HQIC            =  16.12564
Det(Sigma_ml)  =  5539.363                         SBIC            =  16.89469

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     2.94708   0.9202   92.30078   0.0000
revtot               5      98.752   0.9547   168.5675   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3985348   .2761617    -1.44   0.149    -.9398018    .1427321
         L2. |  -.3184537    .294637    -1.08   0.280    -.8959317    .2590242
             |
      revtot |
         L1. |  -.0079338   .0057398    -1.38   0.167    -.0191836     .003316
         L2. |   .0350766   .0075416     4.65   0.000     .0202953     .049858
             |
       _cons |    17.7625   6.161306     2.88   0.004     5.686566    29.83844
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -9.755081   9.253728    -1.05   0.292    -27.89206    8.381893
         L2. |  -4.404155   9.872806    -0.45   0.656     -23.7545    14.94619
             |
      revtot |
         L1. |   1.681681   .1923306     8.74   0.000      1.30472    2.058643
         L2. |  -.7730837   .2527076    -3.06   0.002    -1.268381    -.277786
             |
       _cons |   553.3178   206.4553     2.68   0.007     148.6728    957.9628
------------------------------------------------------------------------------
```

```
. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  23.764     2    0.000    |
  |               env                ALL |  23.764     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  1.1121     2    0.573    |
  |            revtot                ALL |  1.1121     2    0.573    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -53.28706                         AIC             =  15.82176
FPE            =  39288.38                         HQIC            =  15.15201
Det(Sigma_ml)  =  2092.281                         SBIC            =  15.92107

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      2.7026   0.9329   111.2689   0.0000
cos                  5     61.2451   0.9710   268.0235   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3494689   .2571169    -1.36   0.174    -.8534088    .1544709
         L2. |   -.275612   .2751244    -1.00   0.316    -.8148459    .2636219
             |
         cos |
         L1. |  -.0077689   .0076806    -1.01   0.312    -.0228227    .0072848
         L2. |   .0428687   .0083796     5.12   0.000      .026445    .0592924
             |
       _cons |   19.53055   6.284574     3.11   0.002     7.213013    31.84809
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -15.28886    5.82667    -2.62   0.009    -26.70893   -3.868798
         L2. |  -13.08348   6.234749    -2.10   0.036    -25.30336   -.8635973
             |
         cos |
         L1. |   1.962087   .1740551    11.27   0.000     1.620945    2.303228
         L2. |  -.8169115   .1898943    -4.30   0.000    -1.189097   -.4447255
             |
       _cons |   677.2673   142.4183     4.76   0.000     398.1326    956.4019
------------------------------------------------------------------------------
```

```
. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  29.771     2    0.000    |
  |               env                ALL |  29.771     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  8.0998     2    0.017    |
  |               cos                ALL |  8.0998     2    0.017    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -57.32184                         AIC             =  16.83046
FPE            =  107729.6                         HQIC            =  16.16071
Det(Sigma_ml)  =  5737.082                         SBIC            =  16.92976

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      4.27349   0.8323   39.70065   0.0000
ni                   5       53.887   0.4924    7.75907   0.1008
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1289674   .3512563    -0.37   0.713    -.8174172    .5594824
         L2. |   .0825589   .3645212     0.23   0.821    -.6318896    .7970074
             |
          ni |
         L1. |   -.095238   .0361353    -2.64   0.008     -.166062    -.024414
         L2. |   .2251505   .0953749     2.36   0.018     .0382191    .4120819
             |
       _cons |   26.25738   12.71707     2.06   0.039     1.332368    51.18238
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   4.705136   4.429207     1.06   0.288    -3.975949    13.38622
         L2. |   3.410235   4.596472     0.74   0.458    -5.598684    12.41915
             |
          ni |
         L1. |   .9255844   .4556527     2.03   0.042     .0325214    1.818647
         L2. |  -2.350853   1.202641    -1.95   0.051    -4.707986    .0062806
             |
       _cons |  -106.2299   160.3574    -0.66   0.508    -420.5246    208.0648
------------------------------------------------------------------------------
```

```
. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  7.106     2    0.029     |
  |               env                ALL |  7.106     2    0.029     |
  |--------------------------------------+---------------------------|
  |                ni                env | 1.4291     2    0.489     |
  |                ni                ALL | 1.4291     2    0.489     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -67.28908                        AIC             =  19.32227
FPE            =   1301710                        HQIC            =  18.65252
Det(Sigma_ml)  =  69321.86                        SBIC            =  19.42157

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     5.12735   0.7586   25.13628   0.0000
curra                5     162.751   0.6032   12.16284   0.0162
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1043415   .4154984     0.25   0.802    -.7100203    .9187034
         L2. |     .20681   .4606929     0.45   0.653    -.6961315    1.109751
             |
       curra |
         L1. |   -.006822   .0113506    -0.60   0.548    -.0290688    .0154248
         L2. |   .0297488   .0188562     1.58   0.115    -.0072087    .0667063
             |
       _cons |   6.764135   9.549228     0.71   0.479    -11.95201    25.48028
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   14.15002   13.18861     1.07   0.283    -11.69918    39.99922
         L2. |   2.743524   14.62316     0.19   0.851    -25.91734    31.40439
             |
       curra |
         L1. |   .6483692   .3602877     1.80   0.072    -.0577818     1.35452
         L2. |  -.3329672   .5985274    -0.56   0.578    -1.506059    .8401249
             |
       _cons |   80.87895   303.1084     0.27   0.790    -513.2026    674.9605
------------------------------------------------------------------------------
```

```
. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.4937     2    0.287    |
  |               env                ALL |  2.4937     2    0.287    |
  |--------------------------------------+---------------------------|
  |             curra                env |  1.1545     2    0.561    |
  |             curra                ALL |  1.1545     2    0.561    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -71.98471                         AIC             =  20.49618
FPE            =   4210522                         HQIC            =  19.82643
Det(Sigma_ml)  =    224229                         SBIC            =  20.59548

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.58894   0.8066   33.36798   0.0000
asset                5     327.257   0.6807   17.05533   0.0019
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0056308   .3692497    -0.02   0.988     -.729347    .7180854
         L2. |   .1813215   .3952389     0.46   0.646    -.5933326    .9559756
             |
       asset |
         L1. |  -.0039885   .0048279    -0.83   0.409    -.0134509     .005474
         L2. |    .016088   .0071316     2.26   0.024     .0021102    .0300658
             |
       _cons |   6.571586    7.85239     0.84   0.403    -8.818814    21.96199
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   30.46489    26.3328     1.16   0.247    -21.14644    82.07622
         L2. |  -3.659914    28.1862    -0.13   0.897    -58.90385    51.58402
             |
       asset |
         L1. |   .6890089    .344296     2.00   0.045     .0142012    1.363817
         L2. |  -.2242851   .5085886    -0.44   0.659      -1.2211    .7725303
             |
       _cons |    292.463   559.9879     0.52   0.601    -805.0931    1390.019
------------------------------------------------------------------------------
```

```
. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  5.1006     2    0.078    |
  |               env                ALL |  5.1006     2    0.078    |
  |--------------------------------------+---------------------------|
  |             asset                env |  1.4602     2    0.482    |
  |             asset                ALL |  1.4602     2    0.482    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -62.50298                         AIC             =  18.12574
FPE            =  393432.1                         HQIC            =  17.45599
Det(Sigma_ml)  =  20952.01                         SBIC            =  18.22505

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.48372   0.8154   35.33234   0.0000
currl                5      97.771   0.7291   21.52936   0.0002
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0960511   .4696587    -0.20   0.838    -1.016565    .8244631
         L2. |  -.4765743   .6893931    -0.69   0.489     -1.82776    .8746114
             |
       currl |
         L1. |   .0065862   .0203302     0.32   0.746    -.0332603    .0464327
         L2. |   .0674868     .03059     2.21   0.027     .0075314    .1274421
             |
       _cons |   4.939131   7.316186     0.68   0.500     -9.40033    19.27859
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   9.257277   10.24127     0.90   0.366    -10.81524    29.32979
         L2. |  -11.38519   15.03274    -0.76   0.449    -40.84883    18.07844
             |
       currl |
         L1. |   .0118749   .4433161     0.03   0.979    -.8570086    .8807585
         L2. |    .868797   .6670389     1.30   0.193    -.4385752    2.176169
             |
       _cons |   184.2161    159.535     1.15   0.248    -128.4668    496.8989
------------------------------------------------------------------------------
```

```
. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  5.7226     2    0.057    |
  |               env                ALL |  5.7226     2    0.057    |
  |--------------------------------------+---------------------------|
  |             currl                env |  3.7352     2    0.154    |
  |             currl                ALL |  3.7352     2    0.154    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -47.67839                         AIC             =   14.4196
FPE            =   9667.42                         HQIC            =  13.74985
Det(Sigma_ml)  =   514.833                         SBIC            =   14.5189

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.41003   0.8932   66.91564   0.0000
ltd                  5     55.6636   0.8864   62.40772   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3994284   .3034862    -1.32   0.188    -.9942504    .1953937
         L2. |   .1087529   .2584694     0.42   0.674    -.3978378    .6153436
             |
         ltd |
         L1. |   .0881665   .0265589     3.32   0.001     .0361121     .140221
         L2. |   .0301538   .0288132     1.05   0.295    -.0263191    .0866266
             |
       _cons |   1.276052   5.626444     0.23   0.821    -9.751575    12.30368
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   6.495247   4.953953     1.31   0.190    -3.214323    16.20482
         L2. |   5.255205   4.219122     1.25   0.213    -3.014122    13.52453
             |
         ltd |
         L1. |   .8918093   .4335334     2.06   0.040     .0420994    1.741519
         L2. |  -.3558363   .4703318    -0.76   0.449     -1.27767     .565997
             |
       _cons |  -150.5986   91.84318    -1.64   0.101    -330.6079    29.41072
------------------------------------------------------------------------------
```

```
. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  15.725     2    0.000    |
  |               env                ALL |  15.725     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  2.8996     2    0.235    |
  |               ltd                ALL |  2.8996     2    0.235    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -65.69632                         AIC             =  18.92408
FPE            =  874143.8                         HQIC            =  18.25433
Det(Sigma_ml)  =  46552.04                         SBIC            =  19.02338

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.46314   0.8171   35.73298   0.0000
tl                   5     169.402   0.7541   24.53741   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0194495   .3708173     0.05   0.958    -.7073391    .7462381
         L2. |   .0675912   .4196867     0.16   0.872    -.7549797    .8901621
             |
          tl |
         L1. |   -.002998   .0113026    -0.27   0.791    -.0251507    .0191546
         L2. |   .0324762   .0134953     2.41   0.016      .006026    .0589264
             |
       _cons |   -.809718   6.622275    -0.12   0.903    -13.78914     12.1697
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   18.60341   14.07469     1.32   0.186    -8.982478    46.18929
         L2. |  -2.394968   15.92957    -0.15   0.880    -33.61635    28.82642
             |
          tl |
         L1. |   .2821645   .4289984     0.66   0.511     -.558657    1.122986
         L2. |    .316502   .5122239     0.62   0.537    -.6874384    1.320442
             |
       _cons |   50.07334   251.3541     0.20   0.842    -442.5717    542.7184
------------------------------------------------------------------------------
```

```
. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  5.8495     2    0.054    |
  |               env                ALL |  5.8495     2    0.054    |
  |--------------------------------------+---------------------------|
  |                tl                env |  2.0392     2    0.361    |
  |                tl                ALL |  2.0392     2    0.361    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -66.29332                         AIC             =  19.07333
FPE            =   1014848                         HQIC            =  18.40358
Det(Sigma_ml)  =  54045.15                         SBIC            =  19.17263

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.70748   0.7965   31.31085   0.0000
oe                   5     148.462   0.7219   20.76497   0.0004
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0756244   .3985188    -0.19   0.849    -.8567069    .7054582
         L2. |   .2576638   .3823813     0.67   0.500    -.4917897    1.007117
             |
          oe |
         L1. |  -.0102963   .0088438    -1.16   0.244    -.0276298    .0070372
         L2. |   .0313029   .0148417     2.11   0.035     .0022137     .060392
             |
       _cons |   12.93458   10.11363     1.28   0.201    -6.887773    32.75693
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   18.39239   12.56824     1.46   0.143    -6.240901    43.02568
         L2. |  -.7844133    12.0593    -0.07   0.948    -24.42021    22.85138
             |
          oe |
         L1. |   1.072903   .2789096     3.85   0.000     .5262504    1.619556
         L2. |  -.7967542   .4680673    -1.70   0.089    -1.714149    .1206409
             |
       _cons |   32.66841   318.9574     0.10   0.918    -592.4765    657.8133
------------------------------------------------------------------------------
```

```
. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  4.4491     2    0.108    |
  |               env                ALL |  4.4491     2    0.108    |
  |--------------------------------------+---------------------------|
  |                oe                env |  2.2248     2    0.329    |
  |                oe                ALL |  2.2248     2    0.329    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
22.log
  log type:  text
 closed on:   3 Jul 2012, 12:08:22
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
23.log
  log type:  text
 opened on:   3 Jul 2012, 12:08:31

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -53.46545                         AIC             =  15.86636
FPE            =  41080.19                         HQIC            =  15.19661
Det(Sigma_ml)  =  2187.703                         SBIC            =  15.96566

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     6.29093   0.1652   1.583003   0.8118
revtot               5     19.8808   0.9865   584.5379   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4916765   .4418734    -1.11   0.266    -1.357733    .3743795
         L2. |  -.1876498    .508538    -0.37   0.712    -1.184366    .8090664
             |
      revtot |
         L1. |   .0053731   .0429986     0.12   0.901    -.0789026    .0896488
```

```
         L2. |  -.0032618   .0470096    -0.07   0.945     -.095399    .0888753
             |
       _cons |   9.049323   6.524784     1.39   0.165    -3.739019    21.83766
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   6.498554   1.396424     4.65   0.000     3.761613    9.235495
         L2. |   6.640037     1.6071     4.13   0.000     3.490178    9.789895
             |
      revtot |
         L1. |   1.320266   .1358857     9.72   0.000     1.053935    1.586596
         L2. |  -.5896992   .1485614    -3.97   0.000    -.8808743   -.2985242
             |
       _cons |   34.76478   20.61986     1.69   0.092    -5.649393    75.17896
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  .04694     2    0.977    |
  |               env                ALL |  .04694     2    0.977    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  24.437     2    0.000    |
  |            revtot                ALL |  24.437     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -51.98456                         AIC             =  15.49614
FPE            =  28369.19                         HQIC            =  14.82639
Det(Sigma_ml)  =  1510.785                         SBIC            =  15.59544

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     6.29678   0.1636   1.565194   0.8150
cos                  5     16.9124   0.9766   333.6525   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4657531   .4375502    -1.06   0.287    -1.323336    .3918295
         L2. |  -.1474892   .4905205    -0.30   0.764    -1.108892    .8139132
             |
         cos |
         L1. |   .0001926   .0615079     0.00   0.998    -.1203607     .120746
```

```
         L2. |   .0034604    .067113     0.05   0.959    -.1280787    .1349995
             |
       _cons |   8.761284   6.504617     1.35   0.178    -3.987531     21.5101
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   3.940255   1.175205     3.35   0.001     1.636896    6.243614
         L2. |   4.742225   1.317476     3.60   0.000     2.160019    7.324431
             |
         cos |
         L1. |   1.382016   .1652026     8.37   0.000     1.058225    1.705807
         L2. |  -.7140353   .1802571    -3.96   0.000    -1.067333   -.3607378
             |
       _cons |   32.86062   17.47058     1.88   0.060    -1.381092    67.10233
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  .03199     2    0.984    |
  |               env                ALL |  .03199     2    0.984    |
  |--------------------------------------+---------------------------|
  |               cos                env |  15.294     2    0.000    |
  |               cos                ALL |  15.294     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -31.90358                         AIC             =  10.47589
FPE            =  187.3193                         HQIC            =  9.806143
Det(Sigma_ml)  =  9.975583                         SBIC            =   10.5752

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     5.94698   0.2540   2.723532   0.6051
ni                   5     1.46826   0.9784   361.6716   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3939308    .377335    -1.04   0.296    -1.133494    .3456321
         L2. |   .2877753   .6116788     0.47   0.638    -.9110932    1.486644
             |
          ni |
         L1. |  -.6012246   .6777931    -0.89   0.375    -1.929675    .7272254
```

```
          L2. |   .5882783    .597721     0.98   0.325    -.5832334     1.75979
              |
        _cons |   8.190623   3.984464     2.06   0.040     .3812181    16.00003
-------------+----------------------------------------------------------------
ni           |
          env |
          L1. |   .8393168   .0931609     9.01   0.000     .6567247    1.021909
          L2. |    .440062   .1510185     2.91   0.004     .1440711    .7360528
              |
           ni |
          L1. |   .8011124   .1673416     4.79   0.000     .4731289    1.129096
          L2. |  -.1020736   .1475725    -0.69   0.489    -.3913103    .1871631
              |
        _cons |  -1.660592   .9837317    -1.69   0.091    -3.588671    .2674865
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  1.0047     2    0.605    |
  |               env                ALL |  1.0047     2    0.605    |
  |--------------------------------------+---------------------------|
  |                ni                env |  82.845     2    0.000    |
  |                ni                ALL |  82.845     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -44.15954                         AIC             =  13.53989
FPE            =  4011.042                         HQIC            =  12.87013
Det(Sigma_ml)  =  213.6058                         SBIC            =  13.63919

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.58701   0.5562   10.02489   0.0400
curra                5      8.4983   0.9844   504.3539   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
          env |
          L1. |  -.9487359   .3328251    -2.85   0.004    -1.601061   -.2964108
          L2. |   -.947633   .4104259    -2.31   0.021    -1.752053   -.1432132
              |
        curra |
          L1. |   .1698563   .0642416     2.64   0.008      .043945    .2957676
```

```
         L2. |  -.1711989   .0658096    -2.60   0.009    -.3001834   -.0422144
             |
       _cons |   14.93985   4.860965     3.07   0.002     5.412535    24.46717
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   3.187318   .6166217     5.17   0.000     1.978762    4.395874
         L2. |   .3762698    .760392     0.49   0.621    -1.114071    1.866611
             |
       curra |
         L1. |   1.127214   .1190199     9.47   0.000     .8939389    1.360488
         L2. |  -.3538707   .1219249    -2.90   0.004     -.592839   -.1149024
             |
       _cons |   26.99992   9.005863     3.00   0.003     9.348749    44.65108
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  7.1357     2    0.028    |
  |               env                ALL |  7.1357     2    0.028    |
  |--------------------------------------+---------------------------|
  |             curra                env |  39.976     2    0.000    |
  |             curra                ALL |  39.976     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -48.00687                         AIC             =  14.50172
FPE            =  10494.81                         HQIC            =  13.83196
Det(Sigma_ml)  =  558.8953                         SBIC            =  14.60102

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     4.82893   0.5081   8.264089   0.0824
asset                5     45.3745   0.9524   159.9843   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.374749   .4807228    -2.86   0.004    -2.316948   -.4325496
         L2. |  -1.832387   .7651362    -2.39   0.017    -3.332026   -.3327474
             |
       asset |
         L1. |   .1156035   .0486517     2.38   0.017     .0202479    .2109592
```

```
         L2. |  -.1130468    .048017    -2.35   0.019    -.2071583   -.0189353
             |
       _cons |   18.69296   5.908235     3.16   0.002     7.113028    30.27288
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   8.118121    4.51706     1.80   0.072    -.7351552     16.9714
         L2. |  -5.344624   7.189522    -0.74   0.457    -19.43583     8.74658
             |
       asset |
         L1. |   1.421877   .4571509     3.11   0.002     .5258782    2.317877
         L2. |  -.4943505   .4511862    -1.10   0.273    -1.378659    .3899583
             |
       _cons |   43.06938    55.5161     0.78   0.438    -65.74019    151.8789
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  5.6571     2    0.059    |
  |               env                ALL |  5.6571     2    0.059    |
  |--------------------------------------+---------------------------|
  |             asset                env |  19.123     2    0.000    |
  |             asset                ALL |  19.123     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -53.85593                         AIC             =  15.96398
FPE            =   45292.8                         HQIC            =  15.29423
Det(Sigma_ml)  =  2412.042                         SBIC            =  16.06329

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     6.26578   0.1718   1.660075   0.7980
currl                5     22.8501   0.7947   30.97134   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3045413   .7078407    -0.43   0.667    -1.691884    1.082801
         L2. |   .0550356   .8603935     0.06   0.949    -1.631305    1.741376
             |
       currl |
         L1. |  -.0485969   .1815404    -0.27   0.789    -.4044096    .3072158
```

```
         L2. |   .0544328   .1760493     0.31   0.757    -.2906176    .3994831
             |
       _cons |   7.320188    8.17902     0.89   0.371    -8.710397    23.35077
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   3.317665   2.581358     1.29   0.199    -1.741703    8.377034
         L2. |   1.148493   3.137688     0.37   0.714    -5.001264    7.298249
             |
       currl |
         L1. |   .6604507   .6620428     1.00   0.318    -.6371294    1.958031
         L2. |   .0640124   .6420178     0.10   0.921    -1.194319    1.322344
             |
       _cons |   19.52091    29.8273     0.65   0.513    -38.93952    77.98135
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  .11166     2    0.946    |
  |               env                ALL |  .11166     2    0.946    |
  |--------------------------------------+---------------------------|
  |             currl                env |  3.6254     2    0.163    |
  |             currl                ALL |  3.6254     2    0.163    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -39.24223                         AIC             =  12.31056
FPE            =  1173.184                         HQIC            =  11.64081
Det(Sigma_ml)  =  62.47726                         SBIC            =  12.40986

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     3.30824   0.7691    26.6527   0.0000
ltd                  5     20.1995   0.9371   119.1549   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.8403686   .2235037    -3.76   0.000    -1.278428   -.4023093
         L2. |  -1.024684   .2794466    -3.67   0.000     -1.57239   -.4769792
             |
         ltd |
         L1. |   .1790153   .0419977     4.26   0.000     .0967013    .2613293
```

```
          L2. |  -.2751442   .0611841    -4.50   0.000    -.3950628   -.1552256
              |
        _cons |   22.82343   4.455163     5.12   0.000     14.09147    31.55539
-------------+----------------------------------------------------------------
ltd          |
          env |
          L1. |   3.804066   1.364673     2.79   0.005     1.129356    6.478776
          L2. |  -.4211587    1.70625    -0.25   0.805    -3.765347     2.92303
              |
          ltd |
          L1. |   1.450265   .2564304     5.66   0.000     .9476705    1.952859
          L2. |   .1488756    .373579     0.40   0.690    -.5833257    .8810769
              |
        _cons |   -51.6236   27.20241    -1.90   0.058    -104.9393    1.692153
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  21.098     2    0.000    |
  |               env                ALL |  21.098     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  12.329     2    0.002    |
  |               ltd                ALL |  12.329     2    0.002    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -39.94081                         AIC             =   12.4852
FPE            =  1397.055                         HQIC            =  11.81545
Det(Sigma_ml)  =  74.39937                         SBIC            =   12.5845

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     2.59285   0.8582   48.41268   0.0000
tl                   5     19.4805   0.9789   370.2662   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
              |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
          env |
          L1. |  -1.906386   .2782755    -6.85   0.000    -2.451796   -1.360976
          L2. |  -2.556086   .4146965    -6.16   0.000    -3.368876   -1.743295
              |
           tl |
          L1. |   .2573195   .0412009     6.25   0.000     .1765672    .3380718
```

```
         L2. |  -.2777303   .0444919    -6.24   0.000    -.3649328   -.1905278
             |
       _cons |   30.25612   4.158489     7.28   0.000     22.10563    38.40661
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   .5959381   2.090734     0.29   0.776    -3.501825    4.693702
         L2. |  -10.82215   3.115689    -3.47   0.001    -16.92879   -4.715509
             |
          tl |
         L1. |   2.127336   .3095499     6.87   0.000     1.520629    2.734042
         L2. |  -1.176253   .3342757    -3.52   0.000    -1.831422   -.5210851
             |
       _cons |   74.16265   31.24347     2.37   0.018     12.92656    135.3987
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  39.37      2    0.000    |
  |               env                ALL |  39.37      2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env | 50.092      2    0.000    |
  |                tl                ALL | 50.092      2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -40.79155                         AIC             =  12.69789
FPE            =  1728.152                         HQIC            =  12.02814
Det(Sigma_ml)  =  92.03174                         SBIC            =  12.79719

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     6.19764   0.1898   1.873678   0.7590
oe                   5     16.6368   0.9538   165.0154   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.6245251   .4744756    -1.32   0.188     -1.55448    .3054301
         L2. |  -.4722825   .7129083    -0.66   0.508    -1.869557    .9249921
             |
          oe |
         L1. |    .057643   .1097497     0.53   0.599    -.1574624    .2727485
```

```
         L2. |  -.0458912   .0965371    -0.48   0.635    -.2351005    .1433181
             |
       _cons |   9.602798   5.179801     1.85   0.064    -.5494263    19.75502
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   6.041625    1.27367     4.74   0.000     3.545277    8.537972
         L2. |   3.730419   1.913713     1.95   0.051    -.0203889    7.481227
             |
          oe |
         L1. |   .5848835   .2946093     1.99   0.047       .00746    1.162307
         L2. |   .1375886   .2591418     0.53   0.595      -.37032    .6454972
             |
       _cons |   9.647093   13.90452     0.69   0.488    -17.60527    36.89946
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  .29102     2    0.865    |
  |               env                ALL |  .29102     2    0.865    |
  |--------------------------------------+---------------------------|
  |                oe                env |  25.868     2    0.000    |
  |                oe                ALL |  25.868     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
23.log
  log type:  text
 closed on:   3 Jul 2012, 12:11:06
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
24.log
  log type:  text
 opened on:   3 Jul 2012, 12:11:12

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -32.73723                         AIC             =  10.68431
FPE            =  230.7251                         HQIC            =  10.01456
Det(Sigma_ml)  =  12.28714                         SBIC            =  10.78361
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .966325   0.8500   45.34488   0.0000
revtot               5     10.0848   0.6232   13.23391   0.0102
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2404252   .2395638     1.00   0.316    -.2291112    .7099615
         L2. |  -.8490243   .2706545    -3.14   0.002    -1.379497   -.3185513
             |
      revtot |
         L1. |  -.0371197   .0331686    -1.12   0.263    -.1021289    .0278895
         L2. |   .1727587   .0414888     4.16   0.000     .0914421    .2540753
             |
       _cons |  -10.48772    3.53754    -2.96   0.003    -17.42117   -3.554264
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -2.757585   2.500146    -1.10   0.270    -7.657781    2.142611
         L2. |  -5.144077   2.824616    -1.82   0.069    -10.68022     .392069
             |
      revtot |
         L1. |   .1402027   .3461553     0.41   0.685    -.5382491    .8186546
         L2. |    .895675   .4329874     2.07   0.039     .0470353    1.744315
             |
       _cons |   42.87059   36.91863     1.16   0.246     -29.4886    115.2298
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  22.869     2    0.000    |
  |               env                ALL |  22.869     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  7.0262     2    0.030    |
  |            revtot                ALL |  7.0262     2    0.030    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.42577                         AIC             =  9.356442
FPE            =  61.15194                         HQIC            =   8.68669
Det(Sigma_ml)  =  3.256612                         SBIC            =  9.455743
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.01865   0.8334   40.00528   0.0000
cos                  5     4.72426   0.8793    58.3015   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0057396   .2803004     0.02   0.984    -.5436391    .5551183
         L2. |   -.851529   .2939848    -2.90   0.004    -1.427729   -.2753294
             |
         cos |
         L1. |   .0031285   .0412506     0.08   0.940    -.0777212    .0839782
         L2. |   .2180421   .0581001     3.75   0.000      .104168    .3319162
             |
       _cons |  -10.94621   3.513915    -3.12   0.002    -17.83336   -4.059067
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -2.128957   1.299966    -1.64   0.101    -4.676844    .4189295
         L2. |  -6.805537   1.363431    -4.99   0.000    -9.477813   -4.133262
             |
         cos |
         L1. |    .259562   .1913104     1.36   0.175    -.1153996    .6345236
         L2. |   1.094352   .2694543     4.06   0.000     .5662313    1.622473
             |
       _cons |   17.09477    16.2967     1.05   0.294    -14.84617    49.03571
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  19.779     2    0.000    |
  |               env                ALL |  19.779     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |  33.421     2    0.000    |
  |               cos                ALL |  33.421     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -21.84806                         AIC             =  7.962014
FPE            =  15.16415                         HQIC            =  7.292263
Det(Sigma_ml)  =  .8075585                         SBIC            =  8.061316
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.27054   0.7407    22.8574   0.0001
ni                   5     3.44796   0.7339   22.05981   0.0002
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .4687909   .2508957     1.87   0.062    -.0229556    .9605374
         L2. |  -.1475466   .2400469    -0.61   0.539    -.6180298    .3229367
             |
          ni |
         L1. |  -.1595456   .0978552    -1.63   0.103    -.3513384    .0322471
         L2. |   .2449425   .0805587     3.04   0.002     .0870504    .4028345
             |
       _cons |   3.968313   1.483642     2.67   0.007     1.060428    6.876198
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -1.507877    .680871    -2.21   0.027     -2.84236   -.1733947
         L2. |   2.207074   .6514299     3.39   0.001     .9302946    3.483853
             |
          ni |
         L1. |   .8031623   .2655558     3.02   0.002     .2826826    1.323642
         L2. |  -.4493339    .218617    -2.06   0.040    -.8778153   -.0208526
             |
       _cons |   1.153565    4.02625     0.29   0.774    -6.737741     9.04487
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  9.8559     2    0.007    |
  |               env                ALL |  9.8559     2    0.007    |
  |--------------------------------------+---------------------------|
  |                ni                env |  11.621     2    0.003    |
  |                ni                ALL |  11.621     2    0.003    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.08156                         AIC             =  10.02039
FPE            =  118.7843                         HQIC            =  9.350638
Det(Sigma_ml)  =  6.325793                         SBIC            =  10.11969
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .917691   0.8647   51.14878   0.0000
curra                5     7.91633   0.2568   2.763905   0.5981
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   -.102857   .2914654    -0.35   0.724    -.6741187    .4684047
         L2. |   .1687776   .1901748     0.89   0.375    -.2039582    .5415134
             |
       curra |
         L1. |    .061719   .0443771     1.39   0.164    -.0252585    .1486966
         L2. |   .2126937   .0708331     3.00   0.003     .0738634    .3515239
             |
       _cons |   -15.7102   3.761462    -4.18   0.000    -23.08253    -8.33787
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |  -2.603519   2.514284    -1.04   0.300    -7.531425    2.324387
         L2. |   1.440469   1.640515     0.88   0.380    -1.774882     4.65582
             |
       curra |
         L1. |   .2671431   .3828129     0.70   0.485    -.4831564    1.017442
         L2. |   .4159568   .6110312     0.68   0.496    -.7816423    1.613556
             |
       _cons |   33.67022   32.44771     1.04   0.299    -29.92612    97.26656
------------------------------------------------------------------------------

. est store curraregeg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  26.227     2    0.000    |
  |               env                ALL |  26.227     2    0.000    |
  |--------------------------------------+---------------------------|
  |             curra                env |  1.1252     2    0.570    |
  |             curra                ALL |  1.1252     2    0.570    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -32.88018                         AIC             =  10.72004
FPE            =  239.1196                         HQIC            =  10.05029
Det(Sigma_ml)  =  12.73418                         SBIC            =  10.81935
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.20385   0.7672   26.37126   0.0000
asset                5     7.92959   0.7811   28.54222   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0777752   .4210341    -0.18   0.853    -.9029868    .7474364
         L2. |   .4390493    .295966     1.48   0.138    -.1410334    1.019132
             |
       asset |
         L1. |   .0278288   .0405241     0.69   0.492    -.0515969    .1072545
         L2. |    .123477   .0640353     1.93   0.054    -.0020299    .2489839
             |
       _cons |  -22.74168    7.60723    -2.99   0.003    -37.65158   -7.831783
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   .9790909   2.773293     0.35   0.724    -4.456464    6.414646
         L2. |  -.9019607   1.949487    -0.46   0.644    -4.722886    2.918965
             |
       asset |
         L1. |   .9447806   .2669264     3.54   0.000     .4216144    1.467947
         L2. |  -.9925017   .4217918    -2.35   0.019    -1.819198    -.165805
             |
       _cons |   186.3405   50.10778     3.72   0.000     88.13108      284.55
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  11.889     2    0.003    |
  |               env                ALL |  11.889     2    0.003    |
  |--------------------------------------+---------------------------|
  |             asset                env |  .21633     2    0.897    |
  |             asset                ALL |  .21633     2    0.897    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.25414                         AIC             =  10.06353
FPE            =  124.0214                         HQIC            =  9.393783
Det(Sigma_ml)  =   6.60469                         SBIC            =  10.16284
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.86715   0.4401   6.28826   0.1786
currl                5      3.74241   0.9312   108.3163   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6663348   .4349986     1.53   0.126    -.1862468    1.518917
         L2. |   .0333108   .6257316     0.05   0.958    -1.193101    1.259722
             |
       currl |
         L1. |   .0411875   .0917459     0.45   0.653    -.1386311    .2210061
         L2. |   .0315217   .0979056     0.32   0.747    -.1603698    .2234132
             |
       _cons |  -1.688057   9.100318    -0.19   0.853    -19.52435    16.14824
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -1.365469   .8718863    -1.57   0.117    -3.074335    .3433966
         L2. |  -5.688123   1.254181    -4.54   0.000    -8.146272   -3.229974
             |
       currl |
         L1. |  -.2538772   .1838902    -1.38   0.167    -.6142953    .1065409
         L2. |  -.3352117   .1962364    -1.71   0.088     -.719828    .0494047
             |
       _cons |   117.9338   18.24016     6.47   0.000     82.1837    153.6838
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  .26804     2    0.875    |
  |               env                ALL |  .26804     2    0.875    |
  |--------------------------------------+---------------------------|
  |             currl                env |  54.476     2    0.000    |
  |             currl                ALL |  54.476     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.35277                         AIC             =  9.338192
FPE            =  60.04606                         HQIC            =   8.66844
Det(Sigma_ml)  =  3.197719                         SBIC            =  9.437494
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .911656   0.8665   51.93457   0.0000
ltd                  5     5.37861   0.6931   18.06395   0.0012
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0754359   .2323535    -0.32   0.745    -.5308403    .3799685
         L2. |  -.2613428   .1751776    -1.49   0.136    -.6046847    .0819991
             |
         ltd |
         L1. |  -.2555652   .0605323    -4.22   0.000    -.3742064   -.1369241
         L2. |  -.0188678    .030804    -0.61   0.540    -.0792424    .0415069
             |
       _cons |   12.02723   1.986251     6.06   0.000     8.134247    15.92021
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   1.642107   1.370844     1.20   0.231    -1.044698    4.328913
         L2. |  -.2420423   1.033517    -0.23   0.815    -2.267699    1.783614
             |
         ltd |
         L1. |   .9671801   .3571299     2.71   0.007     .2672184    1.667142
         L2. |   .1022031   .1817379     0.56   0.574    -.2539967     .458403
             |
       _cons |  -11.42453   11.71853    -0.97   0.330    -34.39242    11.54337
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  26.682     2    0.000    |
  |               env                ALL |  26.682     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  1.5074     2    0.471    |
  |               ltd                ALL |  1.5074     2    0.471    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -16.60439                         AIC             =  6.651097
FPE            =  4.087843                         HQIC            =  5.981346
Det(Sigma_ml)  =  .2176958                         SBIC            =  6.750399
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.00373   0.8382   41.44304   0.0000
tl                   5     2.02583   0.9917   951.3638   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6391313   .2440624     2.62   0.009     .1607778    1.117485
         L2. |  -1.446566   .3228249    -4.48   0.000    -2.079292   -.8138411
             |
          tl |
         L1. |   .0420642    .059344     0.71   0.478    -.0742479    .1583762
         L2. |  -.2711045   .0794514    -3.41   0.001    -.4268264   -.1153826
             |
       _cons |    28.3893   5.797395     4.90   0.000     17.02661    39.75199
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -4.133902   .4925919    -8.39   0.000    -5.099365    -3.16844
         L2. |   3.705942   .6515586     5.69   0.000     2.428911    4.982974
             |
          tl |
         L1. |  -.3176642   .1197741    -2.65   0.008    -.5524172   -.0829112
         L2. |   1.764481    .160357    11.00   0.000     1.450187    2.078775
             |
       _cons |  -42.68778    11.7009    -3.65   0.000    -65.62113   -19.75444
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  20.611     2    0.000    |
  |               env                ALL |  20.611     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  90.093     2    0.000    |
  |                tl                ALL |  90.093     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -22.9018                         AIC             =  8.225449
FPE            =  19.73451                         HQIC            =  7.555697
Det(Sigma_ml)  =   1.05095                         SBIC            =  8.324751
```

```
Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .865451   0.8797   58.50501   0.0000
oe                   5      3.9186   0.9673   236.8239   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1409123   .2423426    -0.58   0.561     -.615895    .3340704
         L2. |  -.3540806   .1635482    -2.16   0.030    -.6746291   -.0335321
             |
          oe |
         L1. |   -.014087   .0293936    -0.48   0.632    -.0716974    .0435233
         L2. |   .1323975   .0410092     3.23   0.001      .052021     .212774
             |
       _cons |  -2.931496   1.390713    -2.11   0.035    -5.657243   -.2057493
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -1.083116   1.097283    -0.99   0.324     -3.23375    1.067518
         L2. |   3.676877    .740516     4.97   0.000     2.225492    5.128261
             |
          oe |
         L1. |   1.356843   .1330887    10.20   0.000     1.095994    1.617692
         L2. |  -.7078904    .185682    -3.81   0.000     -1.07182   -.3439604
             |
       _cons |   25.51633   6.296892     4.05   0.000     13.17465    37.85802
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  30.484     2    0.000    |
  |               env                ALL |  30.484     2    0.000    |
  |--------------------------------------+---------------------------|
  |                oe                env |  24.662     2    0.000    |
  |                oe                ALL |  24.662     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
24.log
  log type:  text
 closed on:   3 Jul 2012, 12:13:26
```

```
----------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
25.log
```

```
  log type:  text
 opened on:   3 Jul 2012, 12:13:43

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -32.68957                         AIC             =  10.67239
FPE            =  227.9924                         HQIC            =  10.00264
Det(Sigma_ml)  =  12.14161                         SBIC            =  10.77169

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .856986   0.5392   9.360349   0.0527
revtot               5       10.86   0.9575   180.3366   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1987259     .31896     0.62   0.533    -.4264242    .8238759
         L2. |   .2738674   .3445655     0.79   0.427    -.4014685    .9492033
             |
      revtot |
         L1. |  -.0078847   .0152698    -0.52   0.606    -.0378129    .0220435
         L2. |   .0198408   .0137498     1.44   0.149    -.0071083    .0467898
             |
       _cons |   1.483341   2.578195     0.58   0.565    -3.569828    6.536511
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   .0420458   4.041968     0.01   0.992    -7.880066    7.964157
         L2. |   6.210404    4.36645     1.42   0.155    -2.347681    14.76849
             |
      revtot |
         L1. |   1.503171   .1935039     7.77   0.000      1.12391    1.882432
         L2. |  -1.003323   .1742418    -5.76   0.000    -1.344831   -.6618157
             |
       _cons |    82.2564   32.67176     2.52   0.012     18.22093    146.2919
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  3.8668     2    0.145    |
  |               env                ALL |  3.8668     2    0.145    |
```

```
  |------------------------------------+---------------------------|
  |           revtot               env |  2.0232     2    0.364     |
  |           revtot               ALL |  2.0232     2    0.364     |
  +----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -34.79668                        AIC             =  11.19917
FPE            =  386.0979                        HQIC            =  10.52942
Det(Sigma_ml)  =  20.56143                        SBIC            =  11.29847

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .858585   0.5375   9.295774   0.0541
cos                  5     14.3148   0.8067   33.39456   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2158807   .3705187     0.58   0.560    -.5103227    .9420841
         L2. |   .2113504   .3624549     0.58   0.560    -.4990482     .921749
             |
         cos |
         L1. |  -.0120914    .032407    -0.37   0.709    -.0756079    .0514252
         L2. |   .0344309   .0296359     1.16   0.245    -.0236543    .0925161
             |
       _cons |   1.377716   3.077425     0.45   0.654    -4.653925    7.409357
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -4.685679   6.177507    -0.76   0.448    -16.79337    7.422013
         L2. |   3.501442   6.043063     0.58   0.562    -8.342744    15.34563
             |
         cos |
         L1. |   1.746396   .5403085     3.23   0.001     .6874106    2.805381
         L2. |  -1.336791   .4941065    -2.71   0.007    -2.305222     -.36836
             |
       _cons |   99.88484   51.30864     1.95   0.052    -.6782437    200.4479
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |------------------------------------+---------------------------|
  |              env               cos |  3.8226     2    0.148     |
  |              env               ALL |  3.8226     2    0.148     |
```

```
  |------------------------------------+---------------------------|
  |              cos              env  |  1.0804     2    0.583    |
  |              cos              ALL  |  1.0804     2    0.583    |
  +----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -33.69247                        AIC             =  10.92312
FPE            =  292.9602                        HQIC            =  10.25337
Det(Sigma_ml)  =  15.60143                        SBIC            =  11.02242

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .911305   0.4789   7.352507   0.1184
ni                   5     11.7033   0.2026   2.032982   0.7297
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2633837   .3152453     0.84   0.403    -.3544857     .881253
         L2. |   .3016465    .394443     0.76   0.444    -.4714476    1.074741
             |
          ni |
         L1. |  -.0332667    .025171    -1.32   0.186    -.0826009    .0160675
         L2. |   .0366822    .044026     0.83   0.405    -.0496071    .1229716
             |
       _cons |   3.665256   3.310265     1.11   0.268    -2.822744    10.15326
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   3.545239   4.048497     0.88   0.381     -4.38967    11.48015
         L2. |   2.439556   5.065584     0.48   0.630    -7.488806    12.36792
             |
          ni |
         L1. |   .1803951   .3232551     0.56   0.577    -.4531733    .8139636
         L2. |  -.6329372   .5653982    -1.12   0.263    -1.741097     .475223
             |
       _cons |  -31.47713   42.51165    -0.74   0.459    -114.7984    51.84418
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |------------------------------------+---------------------------|
  |              env               ni  |  2.4943     2    0.287    |
  |              env              ALL  |  2.4943     2    0.287    |
```

```
  |------------------------------------+---------------------------|
  |               ni               env |  1.0553     2    0.590     |
  |               ni               ALL |  1.0553     2    0.590     |
  +----------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -38.43847                         AIC             =  12.10962
FPE            =  959.6194                         HQIC            =  11.43987
Det(Sigma_ml)  =  51.10399                         SBIC            =  12.20892

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .882502   0.5113   8.370991   0.0789
curra                5      21.7756   0.8472   44.36601   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2324344   .2898215     0.80   0.423    -.3356053    .8004741
         L2. |   .5842517   .4338262     1.35   0.178    -.2660321    1.434536
             |
       curra |
         L1. |  -.0055085   .0201355    -0.27   0.784    -.0449734    .0339564
         L2. |   .0231969   .0200721     1.16   0.248    -.0161437    .0625375
             |
       _cons |  -.5624601      3.231    -0.17   0.862    -6.895103    5.770183
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   16.26319   7.151307     2.27   0.023     2.246882    30.27949
         L2. |   16.83752    10.7046     1.57   0.116    -4.143115    37.81816
             |
       curra |
         L1. |   .7227957   .4968414     1.45   0.146    -.2509957    1.696587
         L2. |   .3290365   .4952767     0.66   0.506    -.6416879    1.299761
             |
       _cons |  -244.0536   79.72448    -3.06   0.002    -400.3107   -87.79646
------------------------------------------------------------------------------

. est store curragreg

. vargranger, estimates (curragreg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |------------------------------------+---------------------------|
  |              env             curra |  3.1905     2    0.203     |
  |              env               ALL |  3.1905     2    0.203     |
```

```
  |-------------------------------------+---------------------------|
  |             curra               env |  12.796     2    0.002    |
  |             curra               ALL |  12.796     2    0.002    |
  +-----------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =          8
Log likelihood = -35.68859                        AIC             =   11.42215
FPE            =  482.5418                        HQIC            =    10.7524
Det(Sigma_ml)  =  25.69749                        SBIC            =   11.52145

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .881514   0.5124   8.407717   0.0777
asset                5     15.3413   0.9613   198.8425   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2624139   .2854867     0.92   0.358    -.2971297    .8219575
         L2. |  -.1764607   .5337175    -0.33   0.741    -1.222528    .8696064
             |
       asset |
         L1. |   .0214621   .0157374     1.36   0.173    -.0093826    .0523067
         L2. |  -.0106988   .0150128    -0.71   0.476    -.0401233    .0187256
             |
       _cons |    3.46464   4.051664     0.86   0.392    -4.476476    11.40576
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   24.87856   4.968441     5.01   0.000     15.14059    34.61652
         L2. |   19.38324   9.288503     2.09   0.037     1.178106    37.58837
             |
       asset |
         L1. |   .7368266   .2738836     2.69   0.007     .2000246    1.273629
         L2. |   .1001412    .261273     0.38   0.702    -.4119446    .6122269
             |
       _cons |  -260.6268   70.51276    -3.70   0.000    -398.8293   -122.4243
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +-----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |-------------------------------------+---------------------------|
  |              env               asset |  3.2156     2    0.200    |
  |              env                 ALL |  3.2156     2    0.200    |
```

```
  |-------------------------------------+---------------------------|
  |             asset               env |  36.951     2    0.000    |
  |             asset               ALL |  36.951     2    0.000    |
  +-----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.88311                         AIC             =  8.970777
FPE            =  41.58322                         HQIC            =  8.301025
Det(Sigma_ml)  =  2.214491                         SBIC            =  9.070079

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .910336   0.4800   7.385206   0.1169
currl                5     7.77471   0.8168   35.67522   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .328691   .3279063     1.00   0.316    -.3139935    .9713755
         L2. |   .6342813   .3564065     1.78   0.075    -.0642626    1.332825
             |
       currl |
         L1. |    .012274   .0240984     0.51   0.611     -.034958     .059506
         L2. |   .0234233   .0243325     0.96   0.336    -.0242676    .0711142
             |
       _cons |  -2.904181   4.330585    -0.67   0.502    -11.39197     5.58361
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   1.598203   2.800478     0.57   0.568    -3.890633    7.087039
         L2. |  -7.255836   3.043884    -2.38   0.017    -13.22174   -1.289933
             |
       currl |
         L1. |   .9503869    .205812     4.62   0.000     .5470028    1.353771
         L2. |  -1.103874   .2078117    -5.31   0.000    -1.511177   -.6965707
             |
       _cons |   157.6325   36.98529     4.26   0.000     85.14267    230.1223
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +-----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |-------------------------------------+---------------------------|
  |              env              currl |  2.5167     2    0.284    |
  |              env                ALL |  2.5167     2    0.284    |
```

```
  |-----------------------------------------+---------------------------|
  |            currl               env |  6.0096     2    0.050     |
  |            currl               ALL |  6.0096     2    0.050     |
  +---------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =          8
Log likelihood = -31.41257                      AIC             =   10.35314
FPE            =  165.6806                      HQIC            =    9.68339
Det(Sigma_ml)  =  8.823226                      SBIC            =   10.45244

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .516974   0.8323   39.70552   0.0000
ltd                  5      16.435   0.5388   9.346834   0.0530
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -1.280906      .3566    -3.59   0.000    -1.979829   -.5819824
         L2. |  -.5822981   .2636175    -2.21   0.027    -1.098979   -.0656172
             |
         ltd |
         L1. |   .0113494   .0114002     1.00   0.319    -.0109946    .0336934
         L2. |  -.0788079   .0167382    -4.71   0.000    -.1116143   -.0460016
             |
       _cons |   26.90137   5.084675     5.29   0.000     16.93559    36.86715
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -11.63556    11.3366    -1.03   0.305    -33.85489    10.58376
         L2. |  -3.132169   8.380613    -0.37   0.709    -19.55787    13.29353
             |
         ltd |
         L1. |   1.033219    .362422     2.85   0.004     .3228852    1.743553
         L2. |  -.8641542   .5321219    -1.62   0.104    -1.907094    .1787856
             |
       _cons |   169.7477   161.6459     1.05   0.294    -147.0725    486.5678
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +---------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |-----------------------------------------+---------------------------|
  |              env               ltd |  24.609     2    0.000     |
  |              env               ALL |  24.609     2    0.000     |
```

```
  |------------------------------------+---------------------------|
  |              ltd               env |  1.1021     2    0.576    |
  |              ltd               ALL |  1.1021     2    0.576    |
  +----------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -33.94555                         AIC             =  10.98639
FPE            =  312.0949                         HQIC            =  10.31664
Det(Sigma_ml)  =  16.62044                         SBIC            =  11.08569

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .792592   0.6058   12.29586   0.0153
tl                   5     13.8688   0.7220   20.77557   0.0004
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2021023   .4223493    -0.48   0.632    -1.029892    .6256872
         L2. |  -.4848766   .5322713    -0.91   0.362    -1.528109    .5583559
             |
          tl |
         L1. |    .033842   .0144207     2.35   0.019     .0055779     .062106
         L2. |   -.049174   .0237187    -2.07   0.038    -.0956619   -.0026861
             |
       _cons |   16.21805    9.34532     1.74   0.083    -2.098437    34.53454
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   15.45368   7.390287     2.09   0.037     .9689843    29.93838
         L2. |   24.50159   9.313705     2.63   0.009     6.247062    42.75611
             |
          tl |
         L1. |    .414796   .2523337     1.64   0.100     -.079769     .909361
         L2. |   .6809426   .4150316     1.64   0.101    -.1325045     1.49439
             |
       _cons |  -321.4552   163.5248    -1.97   0.049     -641.958   -.9524911
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +----------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |------------------------------------+---------------------------|
  |              env                tl |  5.8734     2    0.053    |
  |              env               ALL |  5.8734     2    0.053    |
```

```
  |--------------------------------------+---------------------------|
  |               tl                env  |  7.5295     2    0.023     |
  |               tl                ALL  |  7.5295     2    0.023     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -39.73958                         AIC             =  12.43489
FPE            =  1328.512                         HQIC            =  11.76514
Det(Sigma_ml)  =  70.74916                         SBIC            =   12.5342

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .930658   0.4565   6.720622   0.1514
oe                   5     25.0647   0.8659   51.64222   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0358315   .3458638     0.10   0.917     -.642049     .713712
         L2. |   .2096852   .4377137     0.48   0.632     -.648218    1.067588
             |
          oe |
         L1. |  -.0001092   .0155596    -0.01   0.994    -.0306056    .0303871
         L2. |   .0112779    .013165     0.86   0.392    -.0145249    .0370807
             |
       _cons |   4.465784   2.946375     1.52   0.130    -1.309005    10.24057
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   20.28641   9.314885     2.18   0.029     2.029572    38.54325
         L2. |   17.46466   11.78861     1.48   0.138    -5.640595    40.56991
             |
          oe |
         L1. |   .2847999   .4190561     0.68   0.497     -.536535    1.106135
         L2. |   .2207941   .3545616     0.62   0.533     -.474134    .9157221
             |
       _cons |  -186.2425   79.35248    -2.35   0.019    -341.7704   -30.71446
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  2.0624     2    0.357     |
  |               env                ALL |  2.0624     2    0.357     |
```

```
  |-------------------------------------+--------------------------|
  |              oe                 env |  7.6186     2    0.022    |
  |              oe                 ALL |  7.6186     2    0.022    |
  +----------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
25.log
  log type:  text
 closed on:   3 Jul 2012, 12:17:00
```

```
---------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
26.log
  log type:  text
 opened on:   3 Jul 2012, 12:17:14

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -59.63914                         AIC             =  17.40978
FPE            =  192279.3                         HQIC            =  16.74003
Det(Sigma_ml)  =  10239.72                         SBIC            =  17.50909

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     8.10251   0.4574   6.742492   0.1501
revtot               5     57.8363   0.9156   86.81363   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2921278   .4248093    -0.69   0.492    -1.124739    .5404832
         L2. |   .1401255   .4022407     0.35   0.728    -.6482517    .9285027
             |
      revtot |
         L1. |   .0856419   .0453849     1.89   0.059    -.0033109    .1745947
         L2. |  -.0561137    .041181    -1.36   0.173    -.1368269    .0245995
             |
       _cons |   3.267826   12.15037     0.27   0.788    -20.54645    27.08211
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -4.292225   3.032317    -1.42   0.157    -10.23546    1.651008
         L2. |   8.121953   2.871221     2.83   0.005     2.494463    13.74944
             |
      revtot |
```

```
         L1. |   1.738839   .3239606     5.37   0.000     1.103887     2.37379
         L2. |  -1.358025   .2939525    -4.62   0.000    -1.934161   -.7818886
             |
       _cons |   302.3508   86.73013     3.49   0.000     132.3629    472.3388
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  3.5616     2    0.169    |
  |               env                ALL |  3.5616     2    0.169    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  8.9897     2    0.011    |
  |            revtot                ALL |  8.9897     2    0.011    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -60.10491                         AIC             =  17.52623
FPE            =  216024.5                         HQIC            =  16.85648
Det(Sigma_ml)  =  11504.26                         SBIC            =  17.62553

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     7.95048   0.4775   7.311709   0.1203
cos                  5     43.5534   0.9319   109.4307   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1672231   .3622251    -0.46   0.644    -.8771712    .5427249
         L2. |   .0099919   .3698962     0.03   0.978    -.7149914    .7349752
             |
         cos |
         L1. |   .1235053    .061691     2.00   0.045     .0025932    .2444175
         L2. |  -.0898572    .056315    -1.60   0.111    -.2002325    .0205181
             |
       _cons |   4.697162   10.17609     0.46   0.644    -15.24761    24.64193
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   .4488545   1.984298     0.23   0.821    -3.440298    4.338007
         L2. |    3.68716   2.026322     1.82   0.069    -.2843568    7.658678
             |
         cos |
```

```
         L1. |   1.793113   .3379484     5.31   0.000     1.130746     2.45548
         L2. |   -1.45418   .3084979    -4.71   0.000    -2.058824   -.8495351
             |
       _cons |   205.2436   55.74545     3.68   0.000     95.98457    314.5027
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  4.008      2    0.135    |
  |               env                ALL |  4.008      2    0.135    |
  |--------------------------------------+---------------------------|
  |               cos                env | 3.4054      2    0.182    |
  |               cos                ALL | 3.4054      2    0.182    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -51.09373                         AIC             =  15.27343
FPE            =  22705.28                         HQIC            =  14.60368
Det(Sigma_ml)  =  1209.157                         SBIC            =  15.37273

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     8.64858   0.3817   4.939595   0.2936
ni                   5     22.5791   0.3817   4.939191   0.2936
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1976448   .3867431     0.51   0.609    -.5603577    .9556472
         L2. |  -.1950459   .4530809    -0.43   0.667    -1.083068    .6929763
             |
          ni |
         L1. |   .0518753   .1639356     0.32   0.752    -.2694324    .3731831
         L2. |   .3439245   .3150197     1.09   0.275    -.2735027    .9613517
             |
       _cons |   13.84012   4.433139     3.12   0.002     5.151329    22.52891
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |  -1.866529   1.009683    -1.85   0.065    -3.845472    .1124144
         L2. |   1.859913   1.182874     1.57   0.116    -.4584775    4.178303
             |
          ni |
```

```
         L1. |    .845271   .4279922     1.97   0.048     .0064216     1.68412
         L2. |   -1.11306   .8224328    -1.35   0.176    -2.724999    .4988785
             |
       _cons |   25.07553   11.57375     2.17   0.030     2.391403    47.75967
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  2.1477     2    0.342    |
  |               env                ALL |  2.1477     2    0.342    |
  |--------------------------------------+---------------------------|
  |                ni                env |  3.6029     2    0.165    |
  |                ni                ALL |  3.6029     2    0.165    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -53.47488                         AIC             =  15.86872
FPE            =  41177.19                         HQIC            =  15.19897
Det(Sigma_ml)  =  2192.868                         SBIC            =  15.96802

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     8.31564   0.4284   5.996487   0.1994
curra                5     26.7789   0.9194   91.23527   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |    .102265   .3240618     0.32   0.752    -.5328844    .7374144
         L2. |   .1620625   .3524457     0.46   0.646    -.5287184    .8528433
             |
       curra |
         L1. |      .1302   .0793955     1.64   0.101    -.0254123    .2858122
         L2. |  -.1176421   .0803532    -1.46   0.143    -.2751316    .0398474
             |
       _cons |   10.08079   13.11567     0.77   0.442    -15.62545    35.78703
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   .2810574   1.043576     0.27   0.788    -1.764314    2.326429
         L2. |   3.982367   1.134981     3.51   0.000     1.757846    6.206889
             |
       curra |
```

```
         L1. |   .9160079   .2556773     3.58   0.000     .4148897    1.417126
         L2. |  -.6888979   .2587616    -2.66   0.008    -1.196061   -.1817345
             |
       _cons |   159.4448   42.23639     3.78   0.000     76.66299    242.2266
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.9766     2    0.226    |
  |               env                ALL |  2.9766     2    0.226    |
  |--------------------------------------+---------------------------|
  |             curra                env |  12.698     2    0.002    |
  |             curra                ALL |  12.698     2    0.002    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -59.13135                         AIC             =  17.28284
FPE            =  169356.1                         HQIC            =  16.61309
Det(Sigma_ml)  =  9018.962                         SBIC            =  17.38214

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     8.00662   0.4701   7.097736   0.1308
asset                5     48.7756   0.9148   85.93569   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0650916   .3142822     0.21   0.836    -.5508901    .6810734
         L2. |   .3055951   .3147176     0.97   0.332    -.3112402    .9224303
             |
       asset |
         L1. |   .0645139   .0390147     1.65   0.098    -.0119536    .1409814
         L2. |  -.0742061   .0394002    -1.88   0.060    -.1514291    .0030168
             |
       _cons |   18.62079   15.98283     1.17   0.244    -12.70498    49.94657
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -.9761477    1.91458    -0.51   0.610    -4.728655     2.77636
         L2. |   7.856558   1.917233     4.10   0.000     4.098851    11.61426
             |
       asset |
```

```
         L1. |   1.053384   .2376744     4.43   0.000     .5875507    1.519217
         L2. |  -.8829307   .2400224    -3.68   0.000    -1.353366   -.4124954
             |
       _cons |   430.7151   97.36603     4.42   0.000     239.8812     621.549
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  3.8402     2    0.147    |
  |               env                ALL |  3.8402     2    0.147    |
  |--------------------------------------+---------------------------|
  |             asset                env |  17.399     2    0.000    |
  |             asset                ALL |  17.399     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -51.97697                         AIC             =  15.49424
FPE            =  28315.47                         HQIC            =  14.82449
Det(Sigma_ml)  =  1507.924                         SBIC            =  15.59355

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     7.70374   0.5094   8.308219   0.0809
currl                5     20.0772   0.9036   74.96428   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1241267   .3641856    -0.34   0.733    -.8379174     .589664
         L2. |   .5112027   .3401825     1.50   0.133    -.1555427    1.177948
             |
       currl |
         L1. |   .1612145   .0909548     1.77   0.076    -.0170536    .3394825
         L2. |  -.1914933   .0919061    -2.08   0.037     -.371626   -.0113606
             |
       _cons |   21.84478   19.37432     1.13   0.260    -16.12818    59.81774
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -2.722261   .9491251    -2.87   0.004    -4.582512   -.8620095
         L2. |   4.618818   .8865691     5.21   0.000     2.881174    6.356461
             |
       currl |
```

```
         L1. |   1.175963   .2370424     4.96   0.000     .7113681    1.640557
         L2. |   -.982209   .2395218    -4.10   0.000    -1.451663   -.5127548
             |
       _cons |   220.5566   50.49252     4.37   0.000     121.5931    319.5201
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  4.7895     2    0.091    |
  |               env                ALL |  4.7895     2    0.091    |
  |--------------------------------------+---------------------------|
  |             currl                env |  27.797     2    0.000    |
  |             currl                ALL |  27.797     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -53.92722                         AIC             =  15.98181
FPE            =  46107.23                         HQIC            =  15.31205
Det(Sigma_ml)  =  2455.415                         SBIC            =  16.08111

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     7.58785   0.5241   8.810182   0.0660
ltd                  5     20.9157   0.7802   28.40118   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2467536   .2488817     0.99   0.321    -.2410455    .7345527
         L2. |   .1241034    .248796     0.50   0.618    -.3635278    .6117346
             |
         ltd |
         L1. |  -.0039026   .0763875    -0.05   0.959    -.1536193    .1458142
         L2. |   -.209433   .0965155    -2.17   0.030    -.3985998   -.0202661
             |
       _cons |   46.22086   16.10274     2.87   0.004     14.66007    77.78165
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |   1.508401    .686036     2.20   0.028     .1637955    2.853007
         L2. |   1.080013   .6857998     1.57   0.115    -.2641295    2.424156
             |
         ltd |
```

```
         L1. |   .0399883   .2105602     0.19   0.849     -.372702    .4526787
         L2. |   .4208047   .2660424     1.58   0.114    -.1006289    .9422383
             |
       _cons |   42.59953    44.3868     0.96   0.337    -44.39699    129.5961
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  5.1832     2    0.075    |
  |               env                ALL |  5.1832     2    0.075    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  20.962     2    0.000    |
  |               ltd                ALL |  20.962     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -59.58412                         AIC             =  17.39603
FPE            =  189652.8                         HQIC            =  16.72628
Det(Sigma_ml)  =  10099.85                         SBIC            =  17.49533

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     7.59979   0.5226   8.757416   0.0675
tl                   5     43.6314   0.8205   36.56572   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1734998   .2632179     0.66   0.510    -.3423978    .6893973
         L2. |   .3099698   .2671663     1.16   0.246    -.2136665    .8336062
             |
          tl |
         L1. |   .0722906   .0503287     1.44   0.151    -.0263519    .1709331
         L2. |  -.1277714    .056348    -2.27   0.023    -.2382115   -.0173313
             |
       _cons |   37.34502   19.20506     1.94   0.052    -.2962097    74.98625
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   .5197483   1.511168     0.34   0.731    -2.442087    3.481583
         L2. |   3.800613   1.533837     2.48   0.013     .7943489    6.806878
             |
          tl |
```

```
         L1. |   .6651997   .2889438     2.30   0.021     .0988802    1.231519
         L2. |  -.4819042   .3235013    -1.49   0.136    -1.115955    .1521467
             |
       _cons |   331.8676   110.2587     3.01   0.003     115.7644    547.9708
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  5.1418     2    0.076    |
  |               env                ALL |  5.1418     2    0.076    |
  |--------------------------------------+---------------------------|
  |                tl                env |  8.5041     2    0.014    |
  |                tl                ALL |  8.5041     2    0.014    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -53.16766                         AIC             =  15.79191
FPE            =  38132.96                         HQIC            =  15.12216
Det(Sigma_ml)  =   2030.75                         SBIC            =  15.89122

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     8.56665   0.3934   5.188276   0.2685
oe                   5     27.9155   0.8447    43.5155   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.0771026   .3890944    -0.20   0.843    -.8397137    .6855085
         L2. |   .0768464   .3775939     0.20   0.839    -.6632241    .8169168
             |
          oe |
         L1. |      .1483   .0969143     1.53   0.126    -.0416485    .3382485
         L2. |  -.0744763   .0924937    -0.81   0.421    -.2557607    .1068081
             |
       _cons |   7.604195   8.032596     0.95   0.344    -8.139404    23.34779
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |  -.9231406   1.267912    -0.73   0.467    -3.408202    1.561921
         L2. |   3.529202   1.230436     2.87   0.004     1.117592    5.940812
             |
          oe |
```

```
         L1. |   1.135184   .3158071     3.59   0.000     .5162137    1.754155
         L2. |  -.8849976   .3014021    -2.94   0.003    -1.475735   -.2942603
             |
       _cons |      84.19    26.1752     3.22   0.001     32.88756    135.4924
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  2.3427     2    0.310    |
  |               env                ALL |  2.3427     2    0.310    |
  |--------------------------------------+---------------------------|
  |                oe                env |  8.3379     2    0.015    |
  |                oe                ALL |  8.3379     2    0.015    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
26.log
  log type:  text
 closed on:   3 Jul 2012, 12:19:31
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
27.log
  log type:  text
 opened on:   3 Jul 2012, 12:19:38

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -31.16588                         AIC             =  10.29147
FPE            =  155.7714                         HQIC            =  9.621718
Det(Sigma_ml)  =  8.295519                         SBIC            =  10.39077

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     1.09848   0.4761   7.269642   0.1223
revtot                5      9.1848   0.8192   36.24864   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .8955612   .5199287     1.72   0.085    -.1234804    1.914603
         L2. |   .3917503   .3663029     1.07   0.285    -.3261902    1.109691
             |
      revtot |
         L1. |  -.0790293   .0528875    -1.49   0.135    -.1826869    .0246284
         L2. |   .0188253   .0448981     0.42   0.675    -.0691734     .106824
             |
       _cons |   12.50948   5.795171     2.16   0.031      1.15115     23.8678
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   6.140028   4.347322     1.41   0.158    -2.380567    14.66062
         L2. |   6.581572   3.062798     2.15   0.032     .5785976    12.58455
             |
      revtot |
         L1. |   .2085366   .4422128     0.47   0.637    -.6581845    1.075258
         L2. |  -.3134754   .3754103    -0.84   0.404    -1.049266    .4223153
             |
       _cons |    185.397   48.45564     3.83   0.000     90.42575    280.3684
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  4.0261     2    0.134    |
  |               env                ALL |  4.0261     2    0.134    |
  |--------------------------------------+---------------------------|
  |            revtot                env |   8.873     2    0.012    |
  |            revtot                ALL |   8.873     2    0.012    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.21772                         AIC             =   8.80443
FPE            =  35.21068                         HQIC            =  8.134678
Det(Sigma_ml)  =  1.875125                         SBIC            =  8.903731

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.04574   0.5252   8.848692   0.0650
cos                  5     5.12381   0.9375   119.9285   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .7180886   .7731811     0.93   0.353    -.7973184    2.233496
         L2. |   .3175978   .3942763     0.81   0.421    -.4551695    1.090365
             |
         cos |
         L1. |  -.0703404   .0727378    -0.97   0.334     -.212904    .0722231
         L2. |   .0135146   .0840229     0.16   0.872    -.1511672    .1781964
             |
       _cons |   9.643775    6.25813     1.54   0.123    -2.621934    21.90949
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -4.441992   3.788363    -1.17   0.241    -11.86705    2.983064
         L2. |   9.645257    1.93184     4.99   0.000     5.858921    13.43159
             |
         cos |
         L1. |    1.19408   .3563943     3.35   0.001     .4955604    1.892601
         L2. |  -1.407102   .4116877    -3.42   0.001    -2.213995   -.6002091
             |
       _cons |   175.8846   30.66303     5.74   0.000     115.7862    235.9831
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  5.2697     2    0.072    |
  |               env                ALL |  5.2697     2    0.072    |
  |--------------------------------------+---------------------------|
  |               cos                env |  35.253     2    0.000    |
  |               cos                ALL |  35.253     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -23.28731                         AIC             =  8.321827
FPE            =  21.73116                         HQIC            =  7.652076
Det(Sigma_ml)  =  1.157281                         SBIC            =  8.421129

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.31685   0.2471   2.625236   0.6224
ni                   5     4.08164   0.5032    8.10352   0.0879
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .5409745    .524208     1.03   0.302    -.4864542    1.568403
         L2. |   .1471165   .4641225     0.32   0.751    -.7625469     1.05678
             |
          ni |
         L1. |   .0004564   .1255672     0.00   0.997    -.2456508    .2465635
         L2. |  -.1245069   .2286907    -0.54   0.586    -.5727323    .3237186
             |
       _cons |   2.362659   3.330617     0.71   0.478     -4.16523    8.890548
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   3.655571   1.624806     2.25   0.024     .4710088    6.840133
         L2. |   2.953553   1.438569     2.05   0.040     .1340101    5.773096
             |
          ni |
         L1. |  -.8567188   .3892012    -2.20   0.028    -1.619539   -.0938985
         L2. |  -1.775598    .708837    -2.50   0.012    -3.164894   -.3863034
             |
       _cons |  -22.47195    10.3234    -2.18   0.029    -42.70544    -2.23846
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  .36822     2    0.832    |
  |               env                ALL |  .36822     2    0.832    |
  |--------------------------------------+---------------------------|
  |                ni                env |  7.5836     2    0.023    |
  |                ni                ALL |  7.5836     2    0.023    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -30.5933                         AIC             =  10.14833
FPE            =  134.9961                         HQIC            =  9.478575
Det(Sigma_ml)  =  7.189143                         SBIC            =  10.24763

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .873985   0.6683   16.12148   0.0029
curra                5     8.34951   0.7377   22.49588   0.0002
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .3862747    .308855     1.25   0.211    -.2190699    .9916193
         L2. |   .2302511   .2075903     1.11   0.267    -.1766184    .6371206
             |
       curra |
         L1. |  -.0230636   .0278258    -0.83   0.407    -.0776011     .031474
         L2. |  -.0624229   .0252027    -2.48   0.013    -.1118193   -.0130265
             |
       _cons |   14.39191   3.587042     4.01   0.000     7.361434    21.42238
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   7.469808   2.950608     2.53   0.011     1.686722    13.25289
         L2. |   .7080678   1.983188     0.36   0.721     -3.17891    4.595046
             |
       curra |
         L1. |  -.0819488   .2658303    -0.31   0.758    -.6029665     .439069
         L2. |  -.4384894   .2407711    -1.82   0.069    -.9103921    .0334133
             |
       _cons |   166.3297   34.26836     4.85   0.000     99.16498    233.4945
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  10.998     2    0.004    |
  |               env                ALL |  10.998     2    0.004    |
  |--------------------------------------+---------------------------|
  |             curra                env |  8.1588     2    0.017    |
  |             curra                ALL |  8.1588     2    0.017    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -33.72209                         AIC             =  10.93052
FPE            =  295.1377                         HQIC            =  10.26077
Det(Sigma_ml)  =  15.71739                         SBIC            =  11.02982

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .890465   0.6557   15.23691   0.0042
asset                 5     12.3018   0.8269   38.22005   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .4660119   .3282958     1.42   0.156     -.177436     1.10946
         L2. |   .4328511   .2446842     1.77   0.077    -.0467211    .9124233
             |
       asset |
         L1. |  -.0148778   .0184702    -0.81   0.421    -.0510786    .0213231
         L2. |  -.0445882   .0164801    -2.71   0.007    -.0768885   -.0122878
             |
       _cons |   17.56663   4.784389     3.67   0.000     8.189397    26.94386
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   12.40751   4.535406     2.74   0.006     3.518276    21.29674
         L2. |    5.87947   3.380312     1.74   0.082    -.7458193    12.50476
             |
       asset |
         L1. |  -.0173452   .2551653    -0.07   0.946    -.5174599    .4827696
         L2. |  -.7323086   .2276722    -3.22   0.001    -1.178538   -.2860794
             |
       _cons |   389.6283   66.09633     5.89   0.000     260.0819    519.1747
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  10.301     2    0.006    |
  |               env                ALL |  10.301     2    0.006    |
  |--------------------------------------+---------------------------|
  |             asset                env |  14.024     2    0.001    |
  |             asset                ALL |  14.024     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -31.3405                         AIC             =  10.33513
FPE            =  162.7225                         HQIC            =  9.665374
Det(Sigma_ml)  =  8.665693                         SBIC            =  10.43443

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .609295   0.8388   41.63146   0.0000
currl                5     17.8945   0.2203   2.260788   0.6879
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .6416577   .2172938     2.95   0.003     .2157697    1.067546
         L2. |   .0864263   .1705679     0.51   0.612    -.2478806    .4207332
             |
       currl |
         L1. |  -.0533724   .0169894    -3.14   0.002    -.0866709   -.0200738
         L2. |  -.0926487   .0191425    -4.84   0.000    -.1301673   -.0551301
             |
       _cons |   15.61784   2.386708     6.54   0.000     10.93998    20.29571
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   4.098169   6.381728     0.64   0.521    -8.409787    16.60613
         L2. |   .6577026   5.009428     0.13   0.896    -9.160596      10.476
             |
       currl |
         L1. |    .042086   .4989631     0.08   0.933    -.9358638    1.020036
         L2. |   -.441109    .562198    -0.78   0.433    -1.542997    .6607789
             |
       _cons |   100.9737   70.09552     1.44   0.150    -36.41102    238.3584
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  31.089     2    0.000    |
  |               env                ALL |  31.089     2    0.000    |
  |--------------------------------------+---------------------------|
  |             currl                env |  .94054     2    0.625    |
  |             currl                ALL |  .94054     2    0.625    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -28.84625                         AIC             =  9.711562
FPE            =   87.2242                         HQIC            =   9.04181
Det(Sigma_ml)  =  4.645076                         SBIC            =  9.810864

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.33114   0.2306   2.398314   0.6629
ltd                  5     7.85368   0.7178   20.34737   0.0004
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .4592963   .4332049     1.06   0.289    -.3897697    1.308362
         L2. |   .1177965   .4901776     0.24   0.810     -.842934    1.078527
             |
         ltd |
         L1. |   -.001471   .0482849    -0.03   0.976    -.0961077    .0931656
         L2. |   .0195269   .0448573     0.44   0.663    -.0683918    .1074456
             |
       _cons |   1.643055   5.903127     0.28   0.781     -9.92686    13.21297
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -3.891517   2.555888    -1.52   0.128    -8.900966    1.117931
         L2. |  -9.460075   2.892024    -3.27   0.001    -15.12834   -3.791812
             |
         ltd |
         L1. |  -.2111189   .2848786    -0.74   0.459    -.7694707     .347233
         L2. |  -.5443311    .264656    -2.06   0.040    -1.063047   -.0256149
             |
       _cons |   151.7062   34.82816     4.36   0.000     83.44422    219.9681
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  .1895      2    0.910    |
  |               env                ALL |  .1895      2    0.910    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  15.117     2    0.001    |
  |               ltd                ALL |  15.117     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -26.52685                         AIC             =  9.131712
FPE            =  48.84404                         HQIC            =  8.461961
Det(Sigma_ml)  =  2.601162                         SBIC            =  9.231014

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5       .9231   0.6300   13.62291   0.0086
tl                   5     8.18926   0.7112   19.70354   0.0006
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |  -.1486683   .4152932    -0.36   0.720    -.9626279    .6652913
         L2. |  -.0355852    .283532    -0.13   0.900    -.5912978    .5201274
             |
          tl |
         L1. |   .0863571   .0568973     1.52   0.129    -.0251596    .1978738
         L2. |  -.1436519   .0566478    -2.54   0.011    -.2546796   -.0326242
             |
       _cons |   15.68684   4.823417     3.25   0.001     6.233117    25.14056
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -.3244361   3.684262    -0.09   0.930    -7.545457    6.896585
         L2. |  -2.170733   2.515347    -0.86   0.388    -7.100722    2.759257
             |
          tl |
         L1. |   .9122064    .504763     1.81   0.071     -.077111    1.901524
         L2. |  -.4100213   .5025496    -0.82   0.415       -1.395    .5749578
             |
       _cons |   82.01937   42.79081     1.92   0.055    -1.849082    165.8878
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  9.0298     2    0.011    |
  |               env                ALL |  9.0298     2    0.011    |
  |--------------------------------------+---------------------------|
  |                tl                env |  1.4688     2    0.480    |
  |                tl                ALL |  1.4688     2    0.480    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -30.08854                         AIC             =  10.02214
FPE            =  118.9919                         HQIC            =  9.352384
Det(Sigma_ml)  =  6.336847                         SBIC            =  10.12144

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.26154   0.3090   3.577414   0.4662
oe                   5     9.64504   0.8637   50.67981   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
```

```
         env |
         L1. |   .5390551   .4789786     1.13   0.260    -.3997257    1.477836
         L2. |   .3727665   .5656133     0.66   0.510    -.7358153    1.481348
             |
          oe |
         L1. |  -.0153383   .0483025    -0.32   0.751    -.1100096    .0793329
         L2. |  -.0193903   .0244134    -0.79   0.427    -.0672397    .0284591
             |
       _cons |   5.385903   2.765352     1.95   0.051    -.0340877    10.80589
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   15.83228   3.662015     4.32   0.000     8.654866     23.0097
         L2. |   14.30104   4.324378     3.31   0.001     5.825411    22.77666
             |
          oe |
         L1. |   -.765125   .3692955    -2.07   0.038    -1.488931   -.0413191
         L2. |  -.0337551   .1866517    -0.18   0.856    -.3995858    .3320755
             |
       _cons |   83.21268   21.14241     3.94   0.000     41.77433     124.651
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  1.1181     2    0.572    |
  |               env                ALL |  1.1181     2    0.572    |
  |--------------------------------------+---------------------------|
  |                oe                env |  23.033     2    0.000    |
  |                oe                ALL |  23.033     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
27.log
  log type:  text
 closed on:   3 Jul 2012, 12:21:43
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
28.log
  log type:  text
 opened on:   3 Jul 2012, 12:21:50

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression
```

```
Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood = -47.25099                      AIC             =  14.31275
FPE            =  8687.732                      HQIC            =    13.643
Det(Sigma_ml)  =  462.6603                      SBIC            =  14.41205

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.47335   0.6841   17.32828   0.0017
revtot               5      43.354   0.8603   49.26737   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2349238   .5079345     0.46   0.644    -.7606095    1.230457
         L2. |  -.1906267   .5301977    -0.36   0.719    -1.229795    .8485417
             |
      revtot |
         L1. |   .0217638   .0172828     1.26   0.208    -.0121099    .0556374
         L2. |  -.0066073   .0129679    -0.51   0.610    -.0320239    .0188094
             |
       _cons |   2.489668   2.833157     0.88   0.380    -3.063218    8.042554
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |  -3.205319   14.94618    -0.21   0.830     -32.4993    26.08866
         L2. |  -13.09366   15.60129    -0.84   0.401    -43.67162     17.4843
             |
      revtot |
         L1. |   2.157304   .5085536     4.24   0.000     1.160557    3.154051
         L2. |   -1.48669   .3815869    -3.90   0.000    -2.234586   -.7387929
             |
       _cons |    357.529   83.36681     4.29   0.000      194.133    520.9249
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  1.5893     2    0.452    |
  |               env                ALL |  1.5893     2    0.452    |
  |--------------------------------------+---------------------------|
  |            revtot                env |  .71167     2    0.701    |
  |            revtot                ALL |  .71167     2    0.701    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression
```

```
Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood =  -48.8239                      AIC             =  14.70597
FPE            =  12873.08                      HQIC            =  14.03622
Det(Sigma_ml)  =  685.5488                      SBIC            =  14.80528

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.51025   0.6681   16.10592   0.0029
cos                  5     50.3883   0.7300   21.62798   0.0002
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2787765   .5344343     0.52   0.602    -.7686955    1.326248
         L2. |  -.3155583   .5971794    -0.53   0.597    -1.486008    .8548919
             |
         cos |
         L1. |   .0280215   .0264689     1.06   0.290    -.0238566    .0798997
         L2. |   -.008928   .0170182    -0.52   0.600    -.0422831     .024427
             |
       _cons |   3.800154   2.990224     1.27   0.204    -2.060578    9.660885
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   6.183254   17.83103     0.35   0.729    -28.76492    41.13143
         L2. |  -25.50322   19.92448    -1.28   0.201    -64.55447    13.54804
             |
         cos |
         L1. |   1.975836   .8831172     2.24   0.025     .2449585    3.706714
         L2. |  -1.201884   .5677996    -2.12   0.034    -2.314751   -.0890177
             |
       _cons |   300.3246   99.76674     3.01   0.003     104.7853    495.8638
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  1.1265     2    0.569    |
  |               env                ALL |  1.1265     2    0.569    |
  |--------------------------------------+---------------------------|
  |               cos                env |  2.2634     2    0.322    |
  |               cos                ALL |  2.2634     2    0.322    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression
```

```
Sample:  2003 - 2010                             No. of obs      =         8
Log likelihood = -39.25047                       AIC             =  12.31262
FPE            =  1175.604                       HQIC            =  11.64287
Det(Sigma_ml)  =  62.60615                       SBIC            =  12.41192

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.56581   0.6433   14.42536   0.0061
ni                   5      13.4964   0.4199   5.790202   0.2154
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7044237   .3339036     2.11   0.035     .0499846    1.358863
         L2. |  -.0635711    .452206    -0.14   0.888    -.9498786    .8227364
             |
          ni |
         L1. |   .0299997   .0448514     0.67   0.504    -.0579075     .117907
         L2. |  -.0013055   .0415273    -0.03   0.975    -.0826975    .0800864
             |
       _cons |   4.362579   4.606175     0.95   0.344    -4.665359    13.39052
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   5.702548   2.878065     1.98   0.048     .0616437    11.34345
         L2. |   -1.33492   3.897766    -0.34   0.732    -8.974401    6.304562
             |
          ni |
         L1. |   .0411677   .3865947     0.11   0.915    -.7165441    .7988795
         L2. |  -.2361666    .357942    -0.66   0.509      -.93772    .4653868
             |
       _cons |  -39.54689   39.70269    -1.00   0.319    -117.3627    38.26895
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  .49025     2    0.783    |
  |               env                ALL |  .49025     2    0.783    |
  |--------------------------------------+---------------------------|
  |                ni                env |  4.1464     2    0.126    |
  |                ni                ALL |  4.1464     2    0.126    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression
```

```
Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -38.07743                        AIC             =  12.01936
FPE            =  876.7987                        HQIC            =  11.34961
Det(Sigma_ml)  =  46.69342                        SBIC            =  12.11866

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      1.08243   0.8295   38.92645   0.0000
curra                5      16.8732   0.2953   3.352849   0.5006
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .3821458    .254212     1.50   0.133    -.1161005     .880392
         L2. |   .4753519   .2767938     1.72   0.086     -.067154    1.017858
             |
       curra |
         L1. |  -.0071945   .0226013    -0.32   0.750    -.0514922    .0371032
         L2. |   -.048549   .0178887    -2.71   0.007    -.0836102   -.0134878
             |
       _cons |   18.04739   5.987761     3.01   0.003     6.311592    29.78319
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   .7830293   3.962726     0.20   0.843     -6.98377    8.549829
         L2. |  -.2150374   4.314738    -0.05   0.960    -8.671768    8.241693
             |
       curra |
         L1. |   .3536953   .3523153     1.00   0.315      -.33683    1.044221
         L2. |  -.3904189   .2788537    -1.40   0.161     -.936962    .1561242
             |
       _cons |   280.1551   93.33886     3.00   0.003     97.21426    463.0959
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  9.7664     2    0.008    |
  |               env                ALL |  9.7664     2    0.008    |
  |--------------------------------------+---------------------------|
  |             curra                env |  .06458     2    0.968    |
  |             curra                ALL |  .06458     2    0.968    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression
```

```
Sample:  2003 - 2010                                 No. of obs      =         8
Log likelihood = -36.73593                           AIC             =  11.68398
FPE            =  626.9722                           HQIC            =  11.01423
Det(Sigma_ml)  =  33.38905                           SBIC            =  11.78328

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.06897   0.8337   40.11558   0.0000
asset                5     14.4599   0.8812   59.36201   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1780881   .3421095     0.52   0.603    -.4924342    .8486104
         L2. |   .2349673   .2537149     0.93   0.354    -.2623047    .7322394
             |
       asset |
         L1. |  -.0195941   .0072938    -2.69   0.007    -.0338897   -.0052985
         L2. |  -.0081418    .010639    -0.77   0.444    -.0289938    .0127101
             |
       _cons |   27.60927   10.21933     2.70   0.007     7.579745    47.63879
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |  -15.14514   4.627694    -3.27   0.001    -24.21525   -6.075022
         L2. |  -.5572514   3.431986    -0.16   0.871    -7.283819    6.169317
             |
       asset |
         L1. |   .5006415   .0986627     5.07   0.000     .3072662    .6940167
         L2. |   -.651268   .1439126    -4.53   0.000    -.9333315   -.3692044
             |
       _cons |   1005.141   138.2363     7.27   0.000     734.2028    1276.079
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  10.217     2    0.006    |
  |               env                ALL |  10.217     2    0.006    |
  |--------------------------------------+---------------------------|
  |             asset                env |  22.698     2    0.000    |
  |             asset                ALL |  22.698     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression
```

```
Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -34.97848                        AIC             =  11.24462
FPE            =  404.0505                        HQIC            =  10.57487
Det(Sigma_ml)  =  21.51748                        SBIC            =  11.34392

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     1.1526   0.8067   33.38667   0.0000
currl                 5    19.1087   0.8844   61.18863   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0822456   .3362612     0.24   0.807    -.5768143    .7413055
         L2. |  -.2124892   .2784789    -0.76   0.445    -.7582977    .3333194
             |
       currl |
         L1. |  -.0234153   .0120813    -1.94   0.053    -.0470942    .0002635
         L2. |  -.0289318   .0162043    -1.79   0.074    -.0606915     .002828
             |
       _cons |   31.04472    10.5866     2.93   0.003     10.29536    51.79409
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |  -19.68784   5.574785    -3.53   0.000    -30.61422   -8.761462
         L2. |  -1.998115   4.616827    -0.43   0.665    -11.04693    7.050699
             |
       currl |
         L1. |   .4708767   .2002921     2.35   0.019     .0783115     .863442
         L2. |    -.71677   .2686461    -2.67   0.008    -1.243307   -.1902333
             |
       _cons |   650.8695   175.5125     3.71   0.000     306.8713    994.8676
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  7.669      2    0.022    |
  |               env                ALL |  7.669      2    0.022    |
  |--------------------------------------+---------------------------|
  |             currl                env |  14.162     2    0.001    |
  |             currl                ALL |  14.162     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression
```

```
Sample:  2003 - 2010                                 No. of obs      =         8
Log likelihood = -28.35977                           AIC             =  9.589943
FPE            =  77.23579                           HQIC            =  8.920191
Det(Sigma_ml)  =  4.113149                           SBIC            =  9.689245

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .653637   0.9378   120.6902   0.0000
ltd                  5     15.2906   0.8928   66.64839   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.4468816   .2860827    -1.56   0.118    -1.007593    .1138301
         L2. |  -.0701033   .1618291    -0.43   0.665    -.3872825    .2470759
             |
         ltd |
         L1. |  -.0355021   .0079554    -4.46   0.000    -.0510944   -.0199098
         L2. |  -.0240315   .0141548    -1.70   0.090    -.0517743    .0037114
             |
       _cons |   30.98667   6.474271     4.79   0.000     18.29733    43.67601
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -2.812552   6.692381    -0.42   0.674    -15.92938    10.30427
         L2. |   -10.5784   3.785696    -2.79   0.005    -17.99823   -3.158572
             |
         ltd |
         L1. |   .6941997   .1861024     3.73   0.000     .3294457    1.058954
         L2. |  -.4127529   .3311249    -1.25   0.213    -1.061746      .23624
             |
       _cons |   294.9534   151.4537     1.95   0.051    -1.890483    591.7973
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  40.722     2    0.000    |
  |               env                ALL |  40.722     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  7.9715     2    0.019    |
  |               ltd                ALL |  7.9715     2    0.019    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression
```

```
Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -26.82013                         AIC             =  9.205033
FPE            =  52.55985                         HQIC            =  8.535281
Det(Sigma_ml)  =  2.799045                         SBIC            =  9.304335

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5       .4568   0.9696   255.4912   0.0000
tl                   5     12.5094   0.9821   439.8111   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.7143634   .2094867    -3.41   0.001     -1.12495    -.303777
         L2. |  -.3217495   .1172298    -2.74   0.006    -.5515157   -.0919832
             |
          tl |
         L1. |  -.0175545   .0035012    -5.01   0.000    -.0244168   -.0106923
         L2. |  -.0265155   .0067775    -3.91   0.000    -.0397992   -.0132319
             |
       _cons |   50.02593   6.231016     8.03   0.000     37.81336    62.23849
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |  -3.558889   5.736765    -0.62   0.535    -14.80274    7.684964
         L2. |  -7.054437   3.210322    -2.20   0.028    -13.34655   -.7623204
             |
          tl |
         L1. |    .572802   .0958807     5.97   0.000     .3848792    .7607248
         L2. |   .0599599   .1856002     0.32   0.747    -.3038098    .4237297
             |
       _cons |   298.9322   170.6355     1.75   0.080     -35.5072    633.3716
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  91.758     2    0.000    |
  |               env                ALL |  91.758     2    0.000    |
  |--------------------------------------+---------------------------|
  |                tl                env |  4.9384     2    0.085    |
  |                tl                ALL |  4.9384     2    0.085    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression
```

```
Sample:  2003 - 2010                                No. of obs      =         8
Log likelihood = -37.19898                          AIC             =  11.79974
FPE            =    703.92                          HQIC            =  11.12999
Det(Sigma_ml)  =  37.48686                          SBIC            =  11.89905

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     1.49503   0.6748   16.59919   0.0023
oe                   5     23.9888   0.8786    57.8729   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .4187319   .4235407     0.99   0.323    -.4113926    1.248857
         L2. |  -.2947507   .4752625    -0.62   0.535    -1.226248    .6367466
             |
          oe |
         L1. |   .0177716   .0219996     0.81   0.419    -.0253468    .0608899
         L2. |   .0079604   .0183269     0.43   0.664    -.0279596    .0438805
             |
       _cons |   6.767009   4.386802     1.54   0.123    -1.830964    15.36498
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   11.73038   6.796014     1.73   0.084    -1.589561    25.05032
         L2. |   10.93528   7.625926     1.43   0.152    -4.011265    25.88182
             |
          oe |
         L1. |   .6576156   .3529987     1.86   0.062    -.0342491     1.34948
         L2. |  -.5867438   .2940681    -2.00   0.046    -1.163107   -.0103808
             |
       _cons |  -115.3835   70.38936    -1.64   0.101    -253.3441    22.57714
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  1.3133     2    0.519    |
  |               env                ALL |  1.3133     2    0.519    |
  |--------------------------------------+---------------------------|
  |                oe                env |  5.0412     2    0.080    |
  |                oe                ALL |  5.0412     2    0.080    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
28.log
  log type:  text
 closed on:   3 Jul 2012, 12:24:15
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
29.log
  log type:  text
 opened on:   3 Jul 2012, 12:24:24

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -34.37962                         AIC             =  11.09491
FPE            =  347.8688                         HQIC            =  10.42515
Det(Sigma_ml)  =  18.52556                         SBIC            =  11.19421

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .679605   0.8580   48.3361   0.0000
revtot               5     20.7581   0.8980   70.40892  0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.3335627   .5071966    -0.66   0.511     -1.32765    .6605243
         L2. |  -.8618699   .4911376    -1.75   0.079    -1.824482    .1007421
             |
      revtot |
         L1. |   .0187601   .0109644     1.71   0.087    -.0027297    .0402498
         L2. |   .0299999    .011251     2.67   0.008     .0079483    .0520514
             |
       _cons |  -2.376889   2.049299    -1.16   0.246    -6.393441    1.639663
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   45.48742   15.49202     2.94   0.003     15.12361    75.85122
         L2. |  -21.06325   15.00151    -1.40   0.160    -50.46567    8.339161
             |
      revtot |
         L1. |   .6908912   .3348997     2.06   0.039     .0344998    1.347283
         L2. |  -.6102703   .3436554    -1.78   0.076    -1.283822     .063282
             |
       _cons |   187.8507   62.59463     3.00   0.003     65.16752     310.534
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  7.2846     2    0.026     |
  |               env                ALL |  7.2846     2    0.026     |
  |--------------------------------------+---------------------------|
  |            revtot                env |  14.823     2    0.001     |
  |            revtot                ALL |  14.823     2    0.001     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -28.7734                         AIC             =  9.693351
FPE            =  85.65015                         HQIC            =  9.023599
Det(Sigma_ml)  =  4.561251                         SBIC            =  9.792653

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .688049   0.8544   46.96178   0.0000
cos                  5     10.6211   0.9608   195.8749   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0524115   .4208723     0.12   0.901     -.772483     .877306
         L2. |  -1.358045   .7094986    -1.91   0.056    -2.748637    .0325468
             |
         cos |
         L1. |     .03931   .0231675     1.70   0.090    -.0060974    .0847174
         L2. |   .0268194   .0112355     2.39   0.017     .0047983    .0488406
             |
       _cons |  -.0501756   1.362544    -0.04   0.971    -2.720713    2.620362
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |   37.44274   6.496826     5.76   0.000      24.7092    50.17629
         L2. |   4.812343   10.95223     0.44   0.660    -16.65363    26.27832
             |
         cos |
         L1. |   .3135605   .3576265     0.88   0.381    -.3873745    1.014495
         L2. |  -.8657569   .1734376    -4.99   0.000    -1.205688   -.5258254
             |
       _cons |   104.9718   21.03302     4.99   0.000     63.74785    146.1958
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  6.9117     2    0.032    |
  |               env                ALL |  6.9117     2    0.032    |
  |--------------------------------------+---------------------------|
  |               cos                env |  35.877     2    0.000    |
  |               cos                ALL |  35.877     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                              No. of obs      =         8
Log likelihood = -30.67533                        AIC             =  10.16883
FPE            =  137.7928                        HQIC            =   9.49908
Det(Sigma_ml)  =   7.33808                        SBIC            =  10.26813

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .823918   0.7913    30.3294   0.0000
ni                   5     9.73242   0.5409   9.426263   0.0513
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.9518383   1.089347    -0.87   0.382    -3.086919    1.183242
         L2. |   .9077074   .5718362     1.59   0.112    -.2130709    2.028486
             |
          ni |
         L1. |  -.0092876   .0240273    -0.39   0.699    -.0563802    .0378049
         L2. |   .1807192   .1166744     1.55   0.121    -.0479585    .4093969
             |
       _cons |     6.4517   3.265469     1.98   0.048     .0514986     12.8519
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   .9481689   12.86777     0.07   0.941    -24.27219    26.16853
         L2. |  -6.563872   6.754738    -0.97   0.331    -19.80292    6.675172
             |
          ni |
         L1. |   .1700778   .2838187     0.60   0.549    -.3861967    .7263523
         L2. |   .5622918   1.378201     0.41   0.683    -2.138933    3.263516
             |
       _cons |   47.55834   38.57292     1.23   0.218    -28.04319    123.1599
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  2.3992     2    0.301    |
  |               env                ALL |  2.3992     2    0.301    |
  |--------------------------------------+---------------------------|
  |                ni                env |  6.1593     2    0.046    |
  |                ni                ALL |  6.1593     2    0.046    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -21.89673                         AIC             =  7.974184
FPE            =  15.34982                         HQIC            =  7.304432
Det(Sigma_ml)  =  .8174459                         SBIC            =  8.073485

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .803034   0.8017   32.34887   0.0000
curra                5     9.07189   0.7525   24.32834   0.0001
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.168932   .4828341     2.42   0.015      .222595     2.11527
         L2. |   .2294724   .4881981     0.47   0.638    -.7273783    1.186323
             |
       curra |
         L1. |  -.0457211   .0269901    -1.69   0.090    -.0986208    .0071786
         L2. |  -.0115495   .0348549    -0.33   0.740    -.0798638    .0567648
             |
       _cons |    8.71704   6.510664     1.34   0.181    -4.043626    21.47771
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |   21.67035   5.454586     3.97   0.000     10.97956    32.36114
         L2. |  -5.811476   5.515183    -1.05   0.292    -16.62104    4.998084
             |
       curra |
         L1. |  -.4607179   .3049081    -1.51   0.131    -1.058327    .1368911
         L2. |  -.5772437   .3937563    -1.47   0.143    -1.348992    .1945044
             |
       _cons |    278.447   73.55109     3.79   0.000     134.2895    422.6045
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  2.9471     2    0.229     |
  |               env                ALL |  2.9471     2    0.229     |
  |--------------------------------------+---------------------------|
  |             curra                env |  16.575     2    0.000     |
  |             curra                ALL |  16.575     2    0.000     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -36.27365                         AIC             =  11.56841
FPE            =  558.5431                         HQIC            =  10.89866
Det(Sigma_ml)  =   29.7449                         SBIC            =  11.66771

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .779936   0.8130   34.77412   0.0000
asset                5     27.3149   0.7288     21.498   0.0003
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .7365512   .8364841     0.88   0.379    -.9029275     2.37603
         L2. |   .7108277   .5442841     1.31   0.192    -.3559495    1.777605
             |
       asset |
         L1. |  -.0051053     .01815    -0.28   0.778    -.0406787    .0304681
         L2. |  -.0187634    .011397    -1.65   0.100    -.0411011    .0035744
             |
       _cons |   6.898335   3.428433     2.01   0.044     .1787302    13.61794
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   5.708823   29.29535     0.19   0.845    -51.70901    63.12666
         L2. |   20.43737   19.06192     1.07   0.284     -16.9233    57.79805
             |
       asset |
         L1. |   .5635291   .6356503     0.89   0.375    -.6823226    1.809381
         L2. |  -.9090965   .3991461    -2.28   0.023    -1.691408   -.1267845
             |
       _cons |   355.4779   120.0706     2.96   0.003     120.1439     590.812
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  3.6051     2    0.165    |
  |               env                ALL |  3.6051     2    0.165    |
  |--------------------------------------+---------------------------|
  |             asset                env |   4.021     2    0.134    |
  |             asset                ALL |   4.021     2    0.134    |
  +------------------------------------------------------------------+

. tsset date
      time variable:  date, 2001 to 2010
              delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -31.21625                         AIC             =  10.30406
FPE            =  157.7452                         HQIC            =   9.63431
Det(Sigma_ml)  =  8.400634                         SBIC            =  10.40336

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .641502   0.8735   55.22723   0.0000
currl                5      12.1331   0.5370   9.279212   0.0545
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.432859   .4589927     3.12   0.002     .5332493    2.332468
         L2. |   .0011601   .3680015     0.00   0.997    -.7201096    .7224299
             |
       currl |
         L1. |  -.0777537   .0262749    -2.96   0.003    -.1292515   -.0262559
         L2. |   -.005886   .0189614    -0.31   0.756    -.0430497    .0312778
             |
       _cons |   7.020201   2.568458     2.73   0.006     1.986116    12.05429
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   17.93212   8.681233     2.07   0.039     .9172147    34.94702
         L2. |  -8.387953   6.960256    -1.21   0.228     -22.0298    5.253898
             |
       currl |
         L1. |   -.618069   .4969542    -1.24   0.214    -1.592081    .3559433
         L2. |  -.2843501   .3586301    -0.79   0.428    -.9872521    .4185519
             |
       _cons |   148.3001   48.57894     3.05   0.002     53.08715    243.5131
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  9.1543     2    0.010    |
  |               env                ALL |  9.1543     2    0.010    |
  |--------------------------------------+---------------------------|
  |             currl                env |  5.5899     2    0.061    |
  |             currl                ALL |  5.5899     2    0.061    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.18653                         AIC             =  9.296633
FPE            =  57.60173                         HQIC            =  8.626881
Det(Sigma_ml)  =  3.067548                         SBIC            =  9.395934

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .441341   0.9401   125.5829   0.0000
ltd                  5     12.4187   0.3231   3.817955   0.4312
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.2076259   .2515356    -0.83   0.409    -.7006265    .2853748
         L2. |  -.0584228   .1850891    -0.32   0.752    -.4211909    .3043452
             |
         ltd |
         L1. |  -.0316597   .0177168    -1.79   0.074    -.0663839    .0030645
         L2. |  -.0856347   .0194456    -4.40   0.000    -.1237474    -.047522
             |
       _cons |    15.4778   2.683493     5.77   0.000     10.21825    20.73735
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -3.716796   7.077826    -0.53   0.599    -17.58908    10.15549
         L2. |   3.272411   5.208125     0.63   0.530    -6.935327    13.48015
             |
         ltd |
         L1. |   .2831732   .4985229     0.57   0.570    -.6939137     1.26026
         L2. |   .1583701   .5471695     0.29   0.772    -.9140623    1.230803
             |
       _cons |   23.30645   75.50939     0.31   0.758    -124.6892    171.3021
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  28.243     2    0.000     |
  |               env                ALL |  28.243     2    0.000     |
  |--------------------------------------+---------------------------|
  |               ltd                env |  .45481     2    0.797     |
  |               ltd                ALL |  .45481     2    0.797     |
  +------------------------------------------------------------------+

. tsset date
       time variable:  date, 2001 to 2010
               delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.08297                         AIC             =  9.270742
FPE            =  56.12954                         HQIC            =  8.600991
Det(Sigma_ml)  =  2.989147                         SBIC            =  9.370044

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .569382   0.9003   72.25868   0.0000
tl                    5     12.4016   0.2546   2.732603   0.6035
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   1.150404   .7910535     1.45   0.146    -.4000328     2.70084
         L2. |  -.2821936   .6157746    -0.46   0.647     -1.48909    .9247025
             |
          tl |
         L1. |  -.0540015   .0355186    -1.52   0.128    -.1236166    .0156137
         L2. |  -.0021058   .0243602    -0.09   0.931    -.0498509    .0456393
             |
       _cons |   11.70947   2.840894     4.12   0.000     6.141421    17.27752
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   11.28039   17.22972     0.65   0.513    -22.48925    45.05003
         L2. |  -10.60747   13.41202    -0.79   0.429    -36.89455    15.67961
             |
          tl |
         L1. |  -.2918274   .7736211    -0.38   0.706    -1.808097    1.224442
         L2. |   .0393132   .5305826     0.07   0.941     -1.00061    1.079236
             |
       _cons |   216.7975   61.87676     3.50   0.000     95.52128    338.0737
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  13.775     2    0.001    |
  |               env                ALL |  13.775     2    0.001    |
  |--------------------------------------+---------------------------|
  |                tl                env |  1.1688     2    0.557    |
  |                tl                ALL |  1.1688     2    0.557    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -32.98615                         AIC             =  10.74654
FPE            =  245.5396                         HQIC            =  10.07679
Det(Sigma_ml)  =  13.07608                         SBIC            =  10.84584

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .83315   0.7866    29.4846   0.0000
oe                   5     17.8545   0.8463   44.04607   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5486577   .9906014    -0.55   0.580    -2.490201    1.392885
         L2. |   .0933329   .7408333     0.13   0.900    -1.358674    1.545339
             |
          oe |
         L1. |   .0344665   .0235142     1.47   0.143    -.0116206    .0805535
         L2. |   .0100409   .0353005     0.28   0.776    -.0591467    .0792285
             |
       _cons |   2.248513   1.599836     1.41   0.160    -.8871081    5.384134
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   5.328741   21.22873     0.25   0.802     -36.2788    46.93628
         L2. |   17.34196   15.87616     1.09   0.275    -13.77474    48.45866
             |
          oe |
         L1. |   1.070456   .5039134     2.12   0.034     .0828039    2.058108
         L2. |  -1.073214   .7564939    -1.42   0.156    -2.555914    .4094871
             |
       _cons |   52.43741   34.28471     1.53   0.126    -14.75939    119.6342
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
```

```
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |   2.17     2    0.338     |
  |               env                ALL |   2.17     2    0.338     |
  |--------------------------------------+---------------------------|
  |                oe                env | 1.2217     2    0.543     |
  |                oe                ALL | 1.2217     2    0.543     |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
29.log
  log type:  text
 closed on:   3 Jul 2012, 12:26:39
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
30.log
  log type:  text
 opened on:   3 Jul 2012, 12:26:44

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -15.01339                         AIC             =  6.253346
FPE            =  2.746332                         HQIC            =  5.583595
Det(Sigma_ml)  =  .1462544                         SBIC            =  6.352648

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .242047   0.8812   59.35318   0.0000
revtot               5     7.46355   0.6600   15.53221   0.0037
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0206141   .1455778     0.14   0.887    -.2647131    .3059413
         L2. |  -.9879337   .1545061    -6.39   0.000      -1.29076   -.6851074
             |
      revtot |
         L1. |   .0639596   .0119735     5.34   0.000     .0404919    .0874273
         L2. |  -.0173062   .0093064    -1.86   0.063    -.0355463     .000934
             |
       _cons |  -1.359201   .8072539    -1.68   0.092     -2.94139    .2229871
-------------+----------------------------------------------------------------
```

```
revtot       |
         env |
         L1. |   1.166423   4.488918     0.26   0.795    -7.631694    9.964541
         L2. |  -4.125593   4.764224    -0.87   0.387     -13.4633    5.212115
             |
      revtot |
         L1. |   .8633317   .3692066     2.34   0.019     .1397001    1.586963
         L2. |  -.1240144   .2869637    -0.43   0.666    -.6864528    .4384241
             |
       _cons |   44.81795   24.89182     1.80   0.072    -3.969126    93.60503
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  36.684     2    0.000    |
  |               env                ALL |  36.684     2    0.000    |
  |--------------------------------------+---------------------------|
  |            revtot                env |   .8711     2    0.647    |
  |            revtot                ALL |   .8711     2    0.647    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =  -12.0801                         AIC             =  5.520024
FPE            =  1.319093                         HQIC            =  4.850272
Det(Sigma_ml)  =  .0702475                         SBIC            =  5.619326

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .261151   0.8617   49.85942   0.0000
cos                  5     3.85769   0.6870   17.55981   0.0015
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1581302   .1471832     1.07   0.283    -.1303437     .446604
         L2. |  -.9277152   .1567401    -5.92   0.000     -1.23492   -.6205102
             |
         cos |
         L1. |   .0880742   .0214466     4.11   0.000     .0460395    .1301088
         L2. |  -.0118107   .0158432    -0.75   0.456    -.0428627    .0192414
             |
       _cons |  -1.564036   .8424247    -1.86   0.063    -3.215158    .0870856
-------------+----------------------------------------------------------------
```

```
cos          |
         env |
         L1. |   2.015118   2.174175     0.93   0.354    -2.246186    6.276422
         L2. |  -1.714189   2.315348    -0.74   0.459    -6.252187    2.823809
             |
         cos |
         L1. |   .9120819   .3168071     2.88   0.004     .2911513    1.533013
         L2. |  -.3167258   .2340335    -1.35   0.176    -.7754231    .1419715
             |
       _cons |   31.35941   12.44421     2.52   0.012     6.969219    55.74961
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  30.386     2    0.000    |
  |               env                ALL |  30.386     2    0.000    |
  |--------------------------------------+---------------------------|
  |               cos                env |   1.404     2    0.496    |
  |               cos                ALL |   1.404     2    0.496    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -11.81412                         AIC             =  5.453529
FPE            =  1.234232                         HQIC            =  4.783777
Det(Sigma_ml)  =  .0657283                         SBIC            =  5.552831

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .255114   0.8681   52.63005   0.0000
ni                   5      3.2574   0.3547   4.396846   0.3550
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.5153412   .2170025    -2.37   0.018    -.9406583   -.0900242
         L2. |  -1.027715   .1772971    -5.80   0.000    -1.375211    -.680219
             |
          ni |
         L1. |   .1970557   .0388902     5.07   0.000     .1208323    .2732792
         L2. |   .1371378    .040804     3.36   0.001     .0571635    .2171121
             |
       _cons |   4.639872   .5639568     8.23   0.000     3.534537    5.745207
-------------+----------------------------------------------------------------
```

```
ni           |
         env |
         L1. |  -3.881016   2.770779    -1.40   0.161    -9.311643    1.549611
         L2. |  -3.882678   2.263804    -1.72   0.086    -8.319652    .5542968
             |
          ni |
         L1. |   .7097938   .4965668     1.43   0.153    -.2634592    1.683047
         L2. |   .8702066   .5210023     1.67   0.095    -.1509391    1.891352
             |
       _cons |   17.36124   7.200837     2.41   0.016      3.24786    31.47462
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  32.224     2    0.000    |
  |               env                ALL |  32.224     2    0.000    |
  |--------------------------------------+---------------------------|
  |                ni                env |  3.6918     2    0.158    |
  |                ni                ALL |  3.6918     2    0.158    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -26.33409                         AIC             =  9.083523
FPE            =  46.54608                         HQIC            =  8.413771
Det(Sigma_ml)  =  2.478786                         SBIC            =  9.182825

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .566786   0.3487   4.283368   0.3690
curra                5     8.20508   0.5826   11.16757   0.0247
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .5150086   .3345426     1.54   0.124     -.140683      1.1707
         L2. |  -.5112328    .486072    -1.05   0.293    -1.463916    .4414509
             |
       curra |
         L1. |  -.0045818   .0311738    -0.15   0.883    -.0656813    .0565178
         L2. |   .0112005   .0357912     0.31   0.754     -.058949      .08135
             |
       _cons |   1.821694   4.336229     0.42   0.674    -6.677159    10.32055
-------------+----------------------------------------------------------------
```

```
curra        |
         env |
         L1. |    1.76696   4.843006     0.36   0.715    -7.725157    11.25908
         L2. |  -16.90879   7.036621    -2.40   0.016    -30.70031   -3.117269
             |
       curra |
         L1. |   1.270871   .4512876     2.82   0.005     .3863639    2.155379
         L2. |   1.071049   .5181313     2.07   0.039     .0555308    2.086568
             |
       _cons |  -93.24186   62.77341    -1.49   0.137    -216.2755    29.79175
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  .14917     2    0.928    |
  |               env                ALL |  .14917     2    0.928    |
  |--------------------------------------+---------------------------|
  |             curra                env |  5.7895     2    0.055    |
  |             curra                ALL |  5.7895     2    0.055    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -22.75916                         AIC             =  8.189789
FPE            =  19.04318                         HQIC            =  7.520038
Det(Sigma_ml)  =  1.014134                         SBIC            =  8.289091

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .470687   0.5508   9.811102   0.0437
asset                5     8.72126   0.8107   34.25375   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0628847   .3446534     0.18   0.855    -.6126235    .7383929
         L2. |  -.9218384    .349022    -2.64   0.008    -1.605909   -.2377678
             |
       asset |
         L1. |   .0346208   .0205083     1.69   0.091    -.0055748    .0748163
         L2. |  -.0101942   .0162551    -0.63   0.531    -.0420536    .0216651
             |
       _cons |  -.0841734   1.803958    -0.05   0.963    -3.619866    3.451519
-------------+----------------------------------------------------------------
```

```
asset        |
         env |
         L1. |   5.378476   6.386001     0.84   0.400    -7.137855    17.89481
         L2. |  -14.05667   6.466946    -2.17   0.030    -26.73165    -1.38169
             |
       asset |
         L1. |   .9277112   .3799933     2.44   0.015      .182938    1.672484
         L2. |   .1044992   .3011863     0.35   0.729     -.485815    .6948134
             |
       _cons |   18.91599   33.42511     0.57   0.571    -46.59601      84.428
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  3.8164     2    0.148    |
  |               env                ALL |  3.8164     2    0.148    |
  |--------------------------------------+---------------------------|
  |             asset                env |  6.2075     2    0.045    |
  |             asset                ALL |  6.2075     2    0.045    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood =   -17.166                         AIC             =  6.791499
FPE            =  4.704028                         HQIC            =  6.121748
Det(Sigma_ml)  =  .2505104                         SBIC            =  6.890801

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .51205   0.4684   7.049802   0.1333
currl                5     2.87527   0.3385   4.094113   0.3934
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6871387   .5547732     1.24   0.215    -.4001967    1.774474
         L2. |  -.4898206   .7535198    -0.65   0.516    -1.966692     .987051
             |
       currl |
         L1. |  -.0154696   .1545066    -0.10   0.920     -.318297    .2873579
         L2. |   .0833286   .1294695     0.64   0.520     -.170427    .3370843
             |
       _cons |  -.6982774   10.36306    -0.07   0.946    -21.00951    19.61295
-------------+----------------------------------------------------------------
```

```
currl        |
         env |
         L1. |   5.100429    3.11517     1.64   0.102    -1.005193    11.20605
         L2. |  -3.456414   4.231176    -0.82   0.414    -11.74937    4.836537
             |
       currl |
         L1. |   .5951896   .8675879     0.69   0.493    -1.105252    2.295631
         L2. |   .6734775   .7269993     0.93   0.354    -.7514149     2.09837
             |
       _cons |  -14.11948   58.19082    -0.24   0.808    -128.1714    99.93243
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  1.9845     2    0.371    |
  |               env                ALL |  1.9845     2    0.371    |
  |--------------------------------------+---------------------------|
  |             currl                env |  3.6085     2    0.165    |
  |             currl                ALL |  3.6085     2    0.165    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -3.887399                         AIC             =   3.47185
FPE            =  .1701236                         HQIC            =  2.802098
Det(Sigma_ml)  =  .0090598                         SBIC            =  3.571152

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .303995   0.8126   34.6995   0.0000
ltd                   5     2.68858   0.6249   13.32878  0.0098
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .6166937   .1646002     3.75   0.000     .2940833    .9393041
         L2. |  -.6784949   .1627457    -4.17   0.000    -.9974706   -.3595192
             |
         ltd |
         L1. |   .0713217   .0288584     2.47   0.013     .0147604    .1278831
         L2. |  -.1749671   .0394085    -4.44   0.000    -.2522063   -.0977279
             |
       _cons |   3.630875   .6117674     5.94   0.000     2.431833    4.829917
-------------+----------------------------------------------------------------
```

```
ltd          |
         env |
         L1. |   .4338567    1.45575     0.30   0.766    -2.419362    3.287075
         L2. |   4.197995   1.439349     2.92   0.004     1.376922    7.019068
             |
         ltd |
         L1. |   .0569525    .255228     0.22   0.823    -.4432852    .5571902
         L2. |   .4286244    .348535     1.23   0.219    -.2544916     1.11174
             |
       _cons |  -5.880274    5.41057    -1.09   0.277     -16.4848    4.724248
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  20.328     2    0.000    |
  |               env                ALL |  20.328     2    0.000    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  10.281     2    0.006    |
  |               ltd                ALL |  10.281     2    0.006    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -13.05803                         AIC             =  5.764507
FPE            =   1.68443                         HQIC            =  5.094755
Det(Sigma_ml)  =  .0897034                         SBIC            =  5.863809

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5     .394081   0.6851   17.40886   0.0016
tl                   5     2.10602   0.7151   20.07535   0.0005
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .4422544   .2239543     1.97   0.048     .0033121    .8811967
         L2. |   .0533978   .2661401     0.20   0.841    -.4682272    .5750228
             |
          tl |
         L1. |  -.1318357   .0515669    -2.56   0.011    -.2329048   -.0307665
         L2. |    -.05307    .031851    -1.67   0.096    -.1154968    .0093567
             |
       _cons |   15.28111   4.365491     3.50   0.000       6.7249    23.83731
-------------+----------------------------------------------------------------
```

```
tl           |
         env |
         L1. |   5.288864   1.196839     4.42   0.000     2.943103    7.634625
         L2. |  -.4668111   1.422285    -0.33   0.743    -3.254439    2.320817
             |
          tl |
         L1. |   -.304679   .2755796    -1.11   0.269    -.8448051     .235447
         L2. |   .1603396   .1702154     0.94   0.346    -.1732765    .4939558
             |
       _cons |   74.36747   23.32972     3.19   0.001     28.64206    120.0929
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  8.857     2    0.012     |
  |               env                ALL |  8.857     2    0.012     |
  |--------------------------------------+---------------------------|
  |                tl                env | 19.528     2    0.000     |
  |                tl                ALL | 19.528     2    0.000     |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -18.94188                         AIC             =  7.235471
FPE            =  7.333045                         HQIC            =  6.565719
Det(Sigma_ml)  =  .3905172                         SBIC            =  7.334773

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                  5      .37008   0.7223   20.8115   0.0003
oe                   5     6.92837   0.8525  46.24259   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1455437   .2825053    -0.52   0.606    -.6992439    .4081565
         L2. |  -.8580063   .2487081    -3.45   0.001    -1.345465   -.3705473
             |
          oe |
         L1. |   .0633283   .0223652     2.83   0.005     .0194933    .1071633
         L2. |  -.0314603   .0186247    -1.69   0.091     -.067964    .0050434
             |
       _cons |   1.191937   .8014329     1.49   0.137    -.3788425    2.762717
-------------+----------------------------------------------------------------
```

```
oe           |
         env |
         L1. |  -.7167699   5.288867    -0.14   0.892    -11.08276    9.649219
         L2. |  -8.576123   4.656139    -1.84   0.065    -17.70199    .5497428
             |
          oe |
         L1. |   1.157436    .418706     2.76   0.006     .3367869    1.978084
         L2. |  -.1252811   .3486785    -0.36   0.719    -.8086785    .5581162
             |
       _cons |   22.43422   15.00387     1.50   0.135    -6.972818    51.84126
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  11.114     2    0.004    |
  |               env                ALL |  11.114     2    0.004    |
  |--------------------------------------+---------------------------|
  |                oe                env |  3.4029     2    0.182    |
  |                oe                ALL |  3.4029     2    0.182    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
30.log
  log type:  text
 closed on:   3 Jul 2012, 12:28:53
```

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
31.log
  log type:  text
 opened on:   3 Jul 2012, 12:28:59

. *(12 variables, 10 observations pasted into data editor)

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env revtot

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =         8
Log likelihood = -31.72391                      AIC             =  10.43098
FPE            =  179.0916                      HQIC            =  9.761226
Det(Sigma_ml)  =  9.537423                      SBIC            =  10.53028

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .597255   0.8110   34.32188   0.0000
```

```
revtot              5     13.8039   0.9705   262.9875   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0935559   .2895922     0.32   0.747    -.4740343    .6611461
         L2. |   .3848554   .3588053     1.07   0.283    -.3183901    1.088101
             |
      revtot |
         L1. |   .0148492   .0103939     1.43   0.153    -.0055226    .0352209
         L2. |   -.012795   .0077196    -1.66   0.097    -.0279251    .0023352
             |
       _cons |    3.22315   .8745415     3.69   0.000      1.50908    4.937219
-------------+----------------------------------------------------------------
revtot       |
         env |
         L1. |   .5732864   6.693128     0.09   0.932      -12.545    13.69158
         L2. |   19.10967     8.2928     2.30   0.021     2.856086    35.36326
             |
      revtot |
         L1. |     1.4238   .2402274     5.93   0.000     .9529632    1.894637
         L2. |  -1.147541   .1784173    -6.43   0.000    -1.497233   -.7978495
             |
       _cons |   34.65455   20.21263     1.71   0.086    -4.961471    74.27056
------------------------------------------------------------------------------

. est store revtotreg

. vargranger, estimates (revtotreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env             revtot |  2.805      2    0.246    |
  |               env                ALL |  2.805      2    0.246    |
  |--------------------------------------+---------------------------|
  |            revtot                env | 7.3009      2    0.026    |
  |            revtot                ALL | 7.3009      2    0.026    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env cos

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -22.16522                         AIC             =  8.041305
FPE            =  16.41549                         HQIC            =  7.371554
Det(Sigma_ml)  =  .8741977                         SBIC            =  8.140607

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                 5      .60991   0.8029   32.58373   0.0000
```

```
cos                   5     4.62609   0.9959   1939.479   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0884349   .2953482     0.30   0.765     -.490437    .6673068
         L2. |   .3124386   .3941166     0.79   0.428    -.4600156    1.084893
             |
         cos |
         L1. |   .0222603   .0172747     1.29   0.198    -.0115975    .0561181
         L2. |  -.0204397   .0134583    -1.52   0.129    -.0468175    .0059381
             |
       _cons |   3.759347   1.189103     3.16   0.002     1.428748    6.089946
-------------+----------------------------------------------------------------
cos          |
         env |
         L1. |  -4.016664   2.240176    -1.79   0.073    -8.407328    .3740001
         L2. |   1.355283    2.98932     0.45   0.650    -4.503677    7.214242
             |
         cos |
         L1. |   2.510584   .1310264    19.16   0.000     2.253777    2.767391
         L2. |   -2.00707   .1020795   -19.66   0.000    -2.207143   -1.806998
             |
       _cons |   78.34813   9.019184     8.69   0.000     60.67085     96.0254
------------------------------------------------------------------------------

. est store cosreg

. vargranger, estimates (cosreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                cos |  2.3613     2    0.307    |
  |               env                ALL |  2.3613     2    0.307    |
  |--------------------------------------+---------------------------|
  |               cos                env |   3.371     2    0.185    |
  |               cos                ALL |   3.371     2    0.185    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ni

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.69066                         AIC             =  9.422666
FPE            =  65.33877                         HQIC            =  8.752914
Det(Sigma_ml)  =  3.479579                         SBIC            =  9.521967

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .503534   0.8656   51.54242   0.0000
```

```
ni                    5      10.366   0.0708     .60988   0.9620
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .0550833   .2364569     0.23   0.816    -.4083637    .5185302
         L2. |   1.499891   .6134822     2.44   0.014     .2974876    2.702294
             |
          ni |
         L1. |   .0841418   .0339424     2.48   0.013     .0176158    .1506677
         L2. |  -.2124074   .1227625    -1.73   0.084    -.4530174    .0282027
             |
       _cons |  -1.296838   2.438211    -0.53   0.595    -6.075645    3.481968
-------------+----------------------------------------------------------------
ni           |
         env |
         L1. |   2.256602   4.867833     0.46   0.643    -7.284175    11.79738
         L2. |  -5.297674   12.62949    -0.42   0.675    -30.05101    19.45566
             |
          ni |
         L1. |   .0299738   .6987578     0.04   0.966    -1.339566    1.399514
         L2. |   .5749975   2.527257     0.23   0.820    -4.378336    5.528331
             |
       _cons |   21.28907   50.19438     0.42   0.671     -77.0901    119.6682
------------------------------------------------------------------------------

. est store nireg

. vargranger, estimates (nireg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 ni |  7.2016     2    0.027    |
  |               env                ALL |  7.2016     2    0.027    |
  |--------------------------------------+---------------------------|
  |                ni                env |  .27171     2    0.873    |
  |                ni                ALL |  .27171     2    0.873    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env curra

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -29.60043                         AIC             =  9.900108
FPE            =  105.3226                         HQIC            =  9.230357
Det(Sigma_ml)  =  5.608898                         SBIC            =   9.99941

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .523599   0.8547   47.06636   0.0000
```

```
curra                 5     13.1262   0.8862   62.31718   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1446115   .2483155     0.58   0.560     -.342078    .6313011
         L2. |   .4971534   .2765254     1.80   0.072    -.0448265    1.039133
             |
       curra |
         L1. |   .0166339   .0089828     1.85   0.064    -.0009721      .03424
         L2. |  -.0169334   .0079099    -2.14   0.032    -.0324365   -.0014303
             |
       _cons |    2.83821   .6797355     4.18   0.000     1.505953    4.170467
-------------+----------------------------------------------------------------
curra        |
         env |
         L1. |    .708311   6.225089     0.11   0.909    -11.49264    12.90926
         L2. |   22.19733    6.93229     3.20   0.001      8.61029    35.78437
             |
       curra |
         L1. |    .245927   .2251928     1.09   0.275    -.1954428    .6872967
         L2. |  -.5027373   .1982954    -2.54   0.011     -.891389   -.1140855
             |
       _cons |   18.70746   17.04047     1.10   0.272    -14.69125    52.10617
------------------------------------------------------------------------------

. est store currareg

. vargranger, estimates (currareg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              curra |  6.0588     2    0.048    |
  |               env                ALL |  6.0588     2    0.048    |
  |--------------------------------------+---------------------------|
  |             curra                env |  20.487     2    0.000    |
  |             curra                ALL |  20.487     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env asset

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -35.21296                         AIC             =  11.30324
FPE            =  428.4437                         HQIC            =  10.63349
Det(Sigma_ml)  =  22.81653                         SBIC            =  11.40254

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .598044   0.8105   34.21027   0.0000
```

```
asset                 5      22.984   0.9081   79.03015   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1817134   .2843712     0.64   0.523    -.3756439    .7390708
         L2. |   .4191796   .3511816     1.19   0.233    -.2691238    1.107483
             |
       asset |
         L1. |   .0083417   .0064032     1.30   0.193    -.0042083    .0208916
         L2. |  -.0075266   .0049586    -1.52   0.129    -.0172453     .002192
             |
       _cons |   2.817276    .832818     3.38   0.001     1.184983    4.449569
-------------+----------------------------------------------------------------
asset        |
         env |
         L1. |   13.40722   10.92893     1.23   0.220    -8.013092    34.82753
         L2. |   27.10478   13.49658     2.01   0.045     .6519601    53.55759
             |
       asset |
         L1. |   .4002876    .246086     1.63   0.104    -.0820321    .8826073
         L2. |  -.5022056   .1905674    -2.64   0.008    -.8757108   -.1287003
             |
       _cons |   57.00646   32.00679     1.78   0.075    -5.725703    119.7386
------------------------------------------------------------------------------

. est store assetreg

. vargranger, estimates (assetreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              asset |  2.7765     2    0.250    |
  |               env                ALL |  2.7765     2    0.250    |
  |--------------------------------------+---------------------------|
  |             asset                env |  18.177     2    0.000    |
  |             asset                ALL |  18.177     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env currl

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -27.01323                         AIC             =  9.253307
FPE            =  55.15937                         HQIC            =  8.583555
Det(Sigma_ml)  =  2.937481                         SBIC            =  9.352609

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5      .61063   0.8024   32.48816   0.0000
```

```
currl                 5      10.454   0.8700   53.52837   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .2796939   .3110969     0.90   0.369    -.3300449    .8894327
         L2. |   .3218935   .3509938     0.92   0.359    -.3660418    1.009829
             |
       currl |
         L1. |   .0191904   .0143024     1.34   0.180    -.0088419    .0472226
         L2. |  -.0153019   .0120011    -1.28   0.202    -.0388236    .0082198
             |
       _cons |   2.704863    .794813     3.40   0.001     1.147059    4.262668
-------------+----------------------------------------------------------------
currl        |
         env |
         L1. |   5.336181   5.325964     1.00   0.316    -5.102517    15.77488
         L2. |   10.02061   6.008997     1.67   0.095    -1.756807    21.79803
             |
       currl |
         L1. |    .424245   .2448567     1.73   0.083    -.0556654    .9041554
         L2. |  -.5752343   .2054582    -2.80   0.005    -.9779251   -.1725436
             |
       _cons |  -2.916596   13.60716    -0.21   0.830    -29.58614    23.75295
------------------------------------------------------------------------------

. est store currlreg

. vargranger, estimates (currlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env              currl |  2.3369     2    0.311    |
  |               env                ALL |  2.3369     2    0.311    |
  |--------------------------------------+---------------------------|
  |             currl                env |  18.218     2    0.000    |
  |             currl                ALL |  18.218     2    0.000    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env ltd

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.16625                         AIC             =  8.791562
FPE            =  34.76052                         HQIC            =  8.121811
Det(Sigma_ml)  =  1.851152                         SBIC            =  8.890864

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .463501   0.8862   62.27201   0.0000
```

```
ltd                   5     8.09808   0.8686   52.89074   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |  -.1099189   .2357032    -0.47   0.641    -.5718887    .3520509
         L2. |   .6520969   .2124324     3.07   0.002     .2357371    1.068457
             |
         ltd |
         L1. |   .0265773   .0151639     1.75   0.080    -.0031434    .0562981
         L2. |  -.0442988   .0144754    -3.06   0.002      -.07267   -.0159276
             |
       _cons |   4.108286   .7568222     5.43   0.000     2.624941     5.59163
-------------+----------------------------------------------------------------
ltd          |
         env |
         L1. |  -5.703134   4.118101    -1.38   0.166    -13.77446    2.368196
         L2. |   11.49398   3.711523     3.10   0.002     4.219529    18.76843
             |
         ltd |
         L1. |   .6871005   .2649373     2.59   0.010     .1678329    1.206368
         L2. |  -.3885815   .2529075    -1.54   0.124     -.884271     .107108
             |
       _cons |   -7.33804   13.22286    -0.55   0.579    -33.25437    18.57829
------------------------------------------------------------------------------

. est store ltdreg

. vargranger, estimates (ltdreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                ltd |  9.9409     2    0.007    |
  |               env                ALL |  9.9409     2    0.007    |
  |--------------------------------------+---------------------------|
  |               ltd                env |  14.164     2    0.001    |
  |               ltd                ALL |  14.164     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env tl

Vector autoregression

Sample:  2003 - 2010                            No. of obs      =          8
Log likelihood = -32.67384                      AIC             =   10.66846
FPE            =  227.0976                      HQIC            =   9.998708
Det(Sigma_ml)  =  12.09395                      SBIC            =   10.76776

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .574598   0.8250   37.72513   0.0000
```

```
tl                    5     16.7786   0.8830   60.39487   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1613218   .2704436     0.60   0.551    -.3687379    .6913815
         L2. |   .4605418   .3001562     1.53   0.125    -.1277536    1.048837
             |
          tl |
         L1. |   .0114243   .0088795     1.29   0.198    -.0059792    .0288279
         L2. |  -.0138238   .0072236    -1.91   0.056    -.0279817    .0003341
             |
       _cons |   3.217254   .7612153     4.23   0.000     1.725299    4.709208
-------------+----------------------------------------------------------------
tl           |
         env |
         L1. |   1.961551   7.897116     0.25   0.804    -13.51651    17.43961
         L2. |    17.6928   8.764743     2.02   0.044     .5142166    34.87138
             |
          tl |
         L1. |   .4756963   .2592874     1.83   0.067    -.0324976    .9838902
         L2. |  -.3624822   .2109322    -1.72   0.086    -.7759017    .0509374
             |
       _cons |  -6.802655   22.22795    -0.31   0.760    -50.36863    36.76332
------------------------------------------------------------------------------

. est store tlreg

. vargranger, estimates (tlreg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 tl |  3.6739     2    0.159    |
  |               env                ALL |  3.6739     2    0.159    |
  |--------------------------------------+---------------------------|
  |                tl                env |  13.656     2    0.001    |
  |                tl                ALL |  13.656     2    0.001    |
  +------------------------------------------------------------------+

. tsset date
        time variable:  date, 2001 to 2010
                delta:  1 unit

. var env oe

Vector autoregression

Sample:  2003 - 2010                               No. of obs      =         8
Log likelihood = -25.35238                         AIC             =  8.838096
FPE            =  36.41627                         HQIC            =  8.168344
Det(Sigma_ml)  =  1.939328                         SBIC            =  8.937398

Equation           Parms      RMSE     R-sq      chi2     P>chi2
----------------------------------------------------------------
env                   5     .627014   0.7917   30.39981   0.0000
```

```
oe                    5     6.86669   0.9499   151.5272   0.0000
----------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
env          |
         env |
         L1. |   .1500534   .3031561     0.49   0.621    -.4441216    .7442283
         L2. |   .2786844   .4173563     0.67   0.504     -.539319    1.096688
             |
          oe |
         L1. |   .0186037   .0138545     1.34   0.179    -.0085506     .045758
         L2. |  -.0042398   .0151582    -0.28   0.780    -.0339492    .0254697
             |
       _cons |   1.981161   1.128181     1.76   0.079    -.2300328    4.192354
-------------+----------------------------------------------------------------
oe           |
         env |
         L1. |   13.67751   3.319989     4.12   0.000      7.17045    20.18457
         L2. |   10.50636   4.570644     2.30   0.022     1.548061    19.46465
             |
          oe |
         L1. |   .6138711   .1517263     4.05   0.000     .3164931    .9112492
         L2. |  -1.041032   .1660033    -6.27   0.000    -1.366392   -.7156714
             |
       _cons |   63.74711   12.35518     5.16   0.000     39.53141    87.96282
------------------------------------------------------------------------------

. est store oereg

. vargranger, estimates (oereg)

   Granger causality Wald tests
  +------------------------------------------------------------------+
  |          Equation           Excluded |   chi2     df Prob > chi2 |
  |--------------------------------------+---------------------------|
  |               env                 oe |  1.8037     2    0.406    |
  |               env                ALL |  1.8037     2    0.406    |
  |--------------------------------------+---------------------------|
  |                oe                env |  46.662     2    0.000    |
  |                oe                ALL |  46.662     2    0.000    |
  +------------------------------------------------------------------+

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Granger Test/firm
31.log
  log type:  text
 closed on:   3 Jul 2012, 12:31:14
```

Appendix O: Influence of Automotive and Electronic Industries' on Chemical Financial Performance

```
------------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/Influence of
> Automotive and Electronic industry on Chemical financial performance.log
  log type:  text
 opened on:  13 Jul 2012, 13:50:08

. edit

. *(6 variables, 310 observations pasted into data editor)

. *fixed effects

. *firm specific

. tsset firm date
       panel variable:  firm (strongly balanced)
        time variable:  date, 2001 to 2010
                delta:  1 unit


. xtreg revtot auto elec, fe

Fixed-effects (within) regression               Number of obs      =       310
Group variable: firm                            Number of groups   =        31

R-sq:  within  = 0.2034                         Obs per group: min =        10
       between = 0.0000                                        avg =      10.0
       overall = 0.0118                                        max =        10

                                                F(2,277)           =     35.37
corr(u_i, Xb)  = -0.0000                        Prob > F           =    0.0000

------------------------------------------------------------------------------
      revtot |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        auto |   .0000666   8.51e-06     7.82   0.000     .0000498    .0000833
        elec |  -.0000178   3.17e-06    -5.61   0.000     -.000024   -.0000115
       _cons |   140.4721   88.31458     1.59   0.113    -33.38085    314.3251
-------------+----------------------------------------------------------------
     sigma_u |  530.62092
     sigma_e |  122.36032
         rho |  .94950927   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(30, 277) =   188.06             Prob > F = 0.0000

. xtreg ni auto elec, fe

Fixed-effects (within) regression               Number of obs      =       310
Group variable: firm                            Number of groups   =        31

R-sq:  within  = 0.0970                         Obs per group: min =        10
       between =      .                                        avg =      10.0
       overall = 0.0510                                        max =        10
```

```
                                                F(2,277)          =     14.88
corr(u_i, Xb)  = 0.0000                         Prob > F          =    0.0000

------------------------------------------------------------------------------
          ni |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        auto |   5.94e-06   1.43e-06     4.15   0.000     3.12e-06    8.77e-06
        elec |   1.01e-06   5.34e-07     1.89   0.060    -4.24e-08    2.06e-06
       _cons |  -67.98672   14.87604    -4.57   0.000    -97.27117   -38.70226
-------------+----------------------------------------------------------------
     sigma_u |  19.773102
     sigma_e |  20.610832
         rho |   .4792648   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(30, 277) =     9.20             Prob > F = 0.0000

. log close
      name:  <unnamed>
       log:  /Users/btmnfshstx/Documents/Environment Stata/Final Data
Logs/Influence of
> Automotive and Electronic industry on Chemical financial performance.log
  log type:  text
 closed on:  13 Jul 2012, 13:52:01
```