

Independent Final Report

Gender Diversity in Corporate Japan and its Impact on Financial Performance

by

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Abstract

The purpose of this study is to highlight the effects of gender diversity in corporate leadership and financial performance of Japanese companies. In this paper, we aim to validate how female representation in Japanese corporate leadership affects financial performance and identifying challenges related to implementation of gender diversity in Japan. The idea is to establish an empirical connection between financial performance and gender diversity in senior leadership of corporate Japan following the research of Matsui, Suzuki, Tatebe and Akiba (2014) and Catalyst (2011). We used primary and secondary data for this research. Secondary data consisted on financial ratios and gender diversity figures of Japanese boards. Primary data consisted on anecdotal evidence from prominent female business figures in Japan and overseas. The methodology is a combination of quantitative and qualitative analysis through panel data regressions, surveys and interviews. Results suggest that there is a positive relationship between gender diversity and financial performance in Japanese companies to some extent. The results also show that work life balance is the biggest barrier for higher female representation in corporate Japan and an overhaul in working style and transparency from Japanese corporations is needed to achieve higher female representation in leadership roles.

Introduction

This work project focuses on establishing a relationship between diversity in Japanese Corporate Leadership and the effect it has on financial performance of Japanese corporations. The reason for choosing this research topic is to offer some insight on how to contribute to Japan's stagnating economy and its declining demographic trends. Japan's GDP had a growth of less than 1% for the last two decades so Prime Minister Abe Shinzo stepped back into power for a second term in 2012 with promises to revitalize Japan's economy through his "Abenomics" policies (Rotemberg J. 2014). "Abenomics" is a combination of monetary policies, fiscal policies and structural reforms aimed to stimulate Japan's slow growing economy (Yoshida Reiji, 2016). One of "Abenomics" arrows is "Womenomics", a term first used in 1999 to make reference of advocating more participation of women in Japan's labor force (Matsui, Suzuki, Ushio). Japanese women in government jobs are encouraged to go back to work after maternity leave. However, on the private sector after women return from maternity leave they are transferred to low-paid jobs without benefits. Meanwhile childcare is expensive and difficult to arrange (Henry Tricks, "Summoning the next generation of leaders", *Reimagining Japan* 2011). Not only does Japan miss out on highly capable talent but it forces women to a predicament where they have to choose whether to stay on their careers or sacrifice it to start a family. These factors can be reflected on Japan's demographic trends. A latent demographic trend urges the need to bring back Japan to a way of economic growth. Japan's population peaked at 128 million in 2010 (Ministry of Internal Affairs and Communications, Statistics Bureau, 2010) and began a decline that is forecasted to reduce the population by 1/3 by 2060 (National Institute of Population and Social Security Research, 2012). The Organization for Economic Cooperation and Development (OECD) placed Japan as the oldest population of any OECD country in 2014 and it is expected to remain like that for the foreseeable future.

A study by Goldman Sachs' Portfolio Strategy Research in Japan suggests that increasing female labor participation rates to those of Japanese men could increase the workforce by 7.1 million people and raise GDP by 12.5 percent (Matsui, Suzuki, Tatebe, Akiba, 2014). Moreover, a research by NPO the Catalyst (2011) found that financial performance for Fortune 500 companies with high representation of women in their board of directors outperform those with low representation (Higher women representation companies exhibit higher Return on Equity (ROE) and Return on invested capital (ROIC) than those with fewer to no women in their board of directors (Carter N. Wagner H., 2011). On this study, the

methodology will be a combination of qualitative analysis and quantitative analysis. Panel data regressions will be used to measure significance strength between financial ratios and female representation percentages of Japanese boards. The secondary data will be gathered from archival databases and include financial statements of a five-year time period. Primary data will be collected through interviews and surveys of senior female business leaders from Japan and overseas. Another objective for this research is to identify the barriers for implementation of gender diversity in Japan and provide recommendations based on the findings of our literature and anecdotal evidence.

Literature Review

Japan's Status Quo (Economy & Demographic Trends)

Japan is one of Asia's most developed countries: 2nd largest by GDP. With a dense population of 127 million people, Japan was one of the first Asian countries to industrialize. As a result, Japan has influenced Asia and the world economy considerably. Japanese innovations had major worldwide impact on businesses and their influences can be contemplated in any modern factories. Despite all of the attainments above, the outlook for Japan doesn't look good. Even before the most recent natural disaster of 2011 of the East Japan earthquake and tsunami leading to the nuclear crisis in Fukushima. It seemed uncertain whether Japan as a whole could go through necessary structural changes to be prepared for the future. After World War II, Japan emerged as a large industrial superpower. Against the beliefs of mainstream economists, the Japanese government successfully used industrial policy to encourage the growth of new industries thanks to measures like preferential allocation of capital, promotion of exports, protection from imports and direct investment by international rivals. Nevertheless, expansion declined quickly following the bursting of the bubble in the 1980s with average growth of roughly 1%. The reduced performance of the Japanese Economy has led people to think whether the economic system as a whole is in need of a major overhaul. The absence of reform and current demographic trends is on decline unless and external weight forces Japan back into orbit to a new trajectory (Michael A. Witt, 2017). The stagnating demographic trends only intensify the need to pull Japan back to economic growth. In 2014, the OECD placed Japan as the country with the oldest population compared to other OECD countries. 23% of Japanese people were 65% or older in 2010; It is expected that 40% of Japanese people will be 65 or older in 2060.

In other words, banning mass immigration – a long political prohibition in Japan – about 1.2 working-age Japanese citizens would have to support each retiree in year 2050 (National Institute of Population and Social Security Research, 2012). Ever since mid-1970s Japan's birthrate has remained below replacement levels. Fertility rates sank to 1.26 in 2005 and is unlikely to return to the population replacement level of 2.1 for multiple reasons. Several of which will be discussed on this study. Women in Japan have delayed having babies to enjoy work longer (Olga Garnova, 2016).

Abenomics: Womenomics

Japan's economic growth has been stagnating for the last two decades. Less than 1% of growth in GDP each year to be precise. With all intentions to revitalize Japan's slow economy, Prime Minister Abe Shinzo went back to power for a second term in 2012. His policies came to be popularly known as "Abenomics" and these are an arrangement of monetary policy, flexible fiscal policy and structural reforms. However, by the middle of 2016 progress seemed discouraging. Abe Shinzo won effective legislative supermajority in July of 2016 and his victory speech emphasized that as a whole, Japan had to fast-track Abenomics to meet the nation's expectations. One of the main arrows of Abe Shinzo's policies was "Womenomics". He thought that this would serve as a way to revitalize the economy. He set the goal of empowering women to occupy 30% of leadership roles in Japan by year 2020. Abe Shinzo pressed Japanese Corporations to assign at least one female director, increase funds for childcare, increase capacity for Japanese daycare facilities, tax breaks to encourage married women to join the workforce and repeatedly advocate female empowerment speeches. Defiance from business interests suggest that results would take time and it comes as a challenge to Abe Shinzo considering that he has less than three years in his term.

Diversity in Japan

Gender equality is constitutionally guaranteed but poorly developed. Japan ranks 111th out of 144 countries in 2016 Gender Gap Report (Michael A. Witt, 2017).

Ethnically Japanese are a homogeneous race, however there are other minorities like the Ainu in Hokkaido or Ryukuans in Okinawa. Immigration has left a good number of Chinese-Japanese and Korean-Japanese mixed citizens. Takeda Pharmaceutical's CEO Yasuchika Hasegawa argues that Japan should have more lenient immigration policies like Canada or

Australia to overcome the shrinking population in Japan. Nevertheless, he argues that Japanese officials don't want to because they want to preserve Japan's unique society which is seen as so homogeneous that it could not accept immigrants (Yasuchika Hasegawa, "Toward a lasting recovery", *Reimagining Japan* 2011).

Immigration in Japan

Japan has one of the strongest aversions to immigrations amongst developed countries. According to the OECD, Japan naturalized less than 15,000 citizens in 2007 – far fewer than Switzerland, a country known for its highly restrictive naturalization laws. Foreigners residing in Japan constitute roughly about 2% of Japan's overall population. Japanese people are very sensitive of the "other-ness" of foreigners, making Immigration limited. A change in foreign labor is not beyond the realm of possibility. Nevertheless, it would be exaggerated to imagine Japanese society accepting millions of immigrants that would be necessary to avoid labor force decline. The United Nation's Population Division has estimated that Japan would require a total net of 17 million immigrants between 2000 and 2050 to anticipate depopulation. Japan would need a net inflow of more than 30 million immigrants between the ages of 15 to 64 (Around 650,000 annually) just to maintain the country's working-age population from declining any further (Nicholas Eberstadt, "Demography and Japan's Future", *Reimagining Japan* 2011). These factors are what make immigration a difficult topic in Japan and instead prompted Prime Minister Abe Shinzo to address Japan's untapped labor pool of Japanese women in his "Womenomics" policies.

Women in Corporate Japan

Japan has a lot to gain by promoting female employment considering that Japan's population is forecasted to shrink by 30% and the senior citizen's ratio is expected to reach 40% in 2060. Closing the gender gap could enhance Japan's GDP by almost 13%. In recent years, some progress has been done but there is still room for improvement. Compared to other countries, Japanese women's participation in the workforce is still low. Too few women have leadership positions, there are existing gender pay gaps and tax policies deter married Japanese women from fully taking participation in the workplace. Portfolio Strategy Research at Goldman Sachs proposes three recommendations to enhance women participation in the workforce: (1) Japan's Government should consider deregulation of daycare/nursing care sectors, immigration law reforms, mandatory gender related corporate

releases, equalization of part-time/full-time work, enhanced representation of women in the government. (2) The private sector should emphasize diversity, flex work environments, introduce objective performance evaluations, aim for diversity targets, flex employment contracts and involve male champions promoting diversity. (3) Japanese Society as a whole must work to dismiss the many myths about Womenomics and boost gender equality from home (Matsui, Suzuki, Ushio 2014).

Gender Diversity and Corporate Performance around the world

A study conducted by Peterson Institute for International Economics found that the presence of female leadership improves the performance of firms. Female representation in corporate leadership has a positive correlation with attributes such as size, absence of gender discrimination against female executives and availability of paternal leave. If women achieved gender equality with men it would raise global output by approximately a quarter (McKinsey Global Institute, 2015). Lack of women in corporate leadership position is a developing political matter. Countries like France, Spain, Finland, Iceland and Norway have gone to the point as to demand female presence on corporate boards. When examining performance of big US corporations, it was found that the greater the gender equilibrium is between corporate leaders, the higher stock price and better profitability are associated (Erhardt, Werbel, Shrader, 2003) (Carter et al. 2007). Research on US companies has found that boards with a balanced male to female ratio outperform boards where all members are men (McKinsey 2012). Boards with gender diversity in Latin America have also been found to positively impact the company's performance (McKinsey 2013). The results from the research done by Peterson Institute for International Economics suggest that female representation on company boards and executives may strengthen company's performance. Findings indicate that a shift from no female leaders to 30% of female presence is linked with a 15% in the net revenue margin. The positive correlation of female representation in corporate leadership and profitability could reveal the presence of gender bias, which would give companies that don't discriminate an edge (Noland, Moran, Kotschwar, 2016). The prominent firm Ernst & Young (EY) based in the UK released a report suggesting the links of higher gender diversity in company boards lead to better business performance and thus makes good business sense (Kay, Miller, Bingham, 2016). On EY's report the authors put emphasis that the link between gender diversity and disruption is innovation. EY states that key to achieving innovation in organizations is harnessing the strength of many ideas from

different groups of people who are backed up by a culture of inclusion. The biggest element described to achieve this is gender diversity. EY interviewed 350 executives around 51 countries across seven industries on how organizations address gender diversity. Their research revealed that most leaders acknowledged that higher gender diversity in senior leadership roles is paramount for a business to thrive. EY highlights that a 30% female representation on a company's board improves financial performance. To be more precise, a board with 30% female representation could contribute to up to a six percent increase to its net margin. Through the report EY states that there are five points of disengagement across organizations that prevent them from achieving gender diversity. The first point is a denial from reality where business leaders think that gender equality is already achieved in the corporate world despite the fact that their companies have done almost no progress at their own firms. The interviewed business leaders think that the board at their companies has already closed the gender gap (usually defined as 30% or more female representation) or that it will be so in the coming 10 years. Nevertheless, the World Economic Forum report from 2015 suggests that gender equality is 117 years away. The second point is a disengagement from gender equality related data within companies. Companies are not efficient at measuring progress while trying to achieve higher gender diversity in leadership roles. There is a universal agreement on the value of diversity and yet most of the surveyed businesses by EY were not keeping close tabs on diversity related metrics. Management specialist Peter Drucker once said "What gets measured, gets managed." (Prusak L., 2014) The third point is a lack of development for pipelines of talent. About 72% of interviewed business leaders are confident on attracting and retaining female talent but roughly 56% said they can effectively identify, retain and promote women. There is a big gap between intention and action. Only 18% of interviewed business leaders were able to articulate a structured program to develop female leadership within their organizations. The fourth point is a gap in perspective and perception between men and women. In other words, Men and women see the gender gap problem differently and each have their own approaches to solve it. 61% of women interviewed by EY think their business doesn't have enough diversity on their leadership teams while only 44% of the interviewed men agreed on the issue. When inquired about the key obstacles stopping women from reaching leadership roles there were even bigger gaps found. Around 43% of men stated that one of the biggest barriers was lack of female candidates while only 7% of women agreed that this was the case. The top three obstacles for women achieving leadership roles were an obstructive culture, organizational prejudice and

struggles raising a family while working. The fifth point is a disparity in progress across different sectors. Many industries agree that diversity is valuable for their organizations but the progress for all industries as a whole is not even. To offer some perspective, 63% of the interviewed respondents belonging to banking and capital markets think there is more they can do to promote diversity in leadership. In contrast, only 44% of executives from the oil and gas industry agree on the previous statement. 45% of respondents from the insurance industry stated that are promoting women to leadership roles compared with 65% from life sciences. Some industries may be male dominated historically but EY believes that best practices in several sectors can be replicated in others and thus increase female representation in leadership roles.

Data and Methodology

Hypotheses

1. Effect of gender diversity on financial performance

Supporting the research of Catalyst (2011), it was stated that companies with more women in their board of directors outperformed those with no women at all. McKinsey (2012) also suggests a link between female leadership skills and their contribution to financial performance. Catalyst analyzed Fortune 500 companies with three or more women in their board of directors and compared that with financial indicators. Companies with boards composed of more than three women in four or five years outperformed those with zero women in ROE by 46%. Catalyst employed census data report series for Fortune 500 to figure out the ratio of women in senior leadership roles (Women in board of directors) and it used financial data for the subject companies from Standard & Poor's compustat database. Although the subject companies from the researches above are not Japanese, we believe that findings from their studies are applicable to our research because of the similarity of the data (female ratios in the board of directors and financial ratios). We expect a positive relationship between the percentage of women in the board of directors and financial indicators later described in our methodology. We therefore hypothesize:

H1 Higher female representation in Japanese board of directors results in higher financial performance

2. Gender diversity and gender related metrics

Supporting the research of Groysberg, Boris, Yamazaki, Sato, David Lane (Womenomics, 2017), it is implied that the Japanese private sector is reluctant to publicly disclose gender statistics. Proposals have been in vain because the Keidanren – Japan’s biggest corporate lobby – refuses to cooperate. It’s very difficult to measure progress or set goals for gender diversity if these gender statistics are not made available. Kay, Miller & Bingham (2016) from Ernst & Young state that despite being overwhelming evidence that women in leadership contribute to the bottom line, 70% of the researched companies have no intention on measuring the effects on gender diverse boards on financial performance. We expect that firms that disclose gender statistics have higher financial performance because they are able to measure their gender related metrics and set gender diversity goals. We therefore hypothesize:

H2 Japanese firms that have higher gender diversity transparency have higher financial performance

3. Barriers for gender diversity in Japan

Based on the work from Groysberg, Boris, Yamazaki, Sato, David Lane (Womenomics, 2017), it’s stated that the two main barriers affecting female labor engagement are childcare and fiscal constraints. Childcare dates back to Japan making the Child Care Leave Act in 1991 that required companies to allow paid parental leave until children reached one year of age. Nevertheless, the shortage of child daycare centers and daycare workers makes it difficult for working mothers to place their child in a daycare facility while they work. Even if mothers are able to successfully place their children it’s only until primary school. Fiscal Constraints refer to the tax deduction in Japan for spouses that is implemented to encourage working women to limit working hours. This policy was enacted in 1961 and it allows a ¥380,000 credit against income but only when the spouse is not exceeding the ¥1.03 million limit. This limits certain working women to part time jobs which would make it even more difficult to achieve higher female representation in senior leadership roles due to the lack of skills in part because of the working time limitations. Womenomics (2017) however, fails to mention internal factors that may occur within the company’s culture that would discourage women to pursue a higher role within their organization. Based on anecdotal evidence and vast literature on the topic, we believe that childcare is the biggest barrier for Japanese

women reaching higher levels of representation in senior leadership roles. We therefore hypothesize:

H3 Family responsibilities are the biggest barrier preventing Japanese women from reaching higher levels of representation in leadership roles

Research Method

In this research we use both a quantitative and qualitative approach as our analysis tools to study primary and secondary data. To test hypotheses H1 we will utilize a quantitative approach with secondary data. These will be run with data panel regressions to test any significant correlation between the independent and dependent variables. Hypotheses H2 and H3 will be tested using anecdotal evidence from primary data. The primary data will consist in interviews and surveys to prominent female leaders in Japan who attended the WINConference Japan 2018. The types of data are described below as follows:

Secondary Data

This research will consist in one independent variable and multiple dependent variables. The independent variable is defined as the percentage of women that are members of the board of directors of Japanese firms (we include external board members). We have limited the scope of this research to female representation as the only independent variable. Other factors that could be considered independent variables (female representation in the entire firm, average age of female board directors, number of years at the firm, etc) have purposively been left out so we can concentrate our research on the Japanese government's current narrative of increasing the percentage of women in leadership positions in the next few years. By executives we define all members who range from auditors, operating officers and directors. The dependent variables to test H1 will be financial performance indicators found in the annual reports of Japanese companies later described in our sample selection methods. The financial indicators selected for this research are as follows: Net Profit Margin, Asset Turnover Ratio, Leverage, ROE and ROE. All of these financial metrics are elements of the Dupont framework. The DuPont framework comes from the famous chemical DuPont Corporation who started using this formula back in 1920s. An explosives salesman by the name of Donaldson Brown invented the formula in an internal efficiency report in 1912

(Staff I., 2015) . It basically consists in breaking down Return on Equity (ROE) in its three components: Financial Leverage (also known as equity multiplier) , Asset Turnover and Net Profit Margin. By separating each component into smaller pieces, one can identify essential elements that may be affecting any of the three core components. The reason that five dependent variables are taken instead of the three above is because ROA and ROE are examined independently from the three main components of the total ROE. In theory, ROA multiplied by financial leverage should equal to ROE but an approximation error may occur so all variables are examined independently against the independent variable of this research to preserve the integrity of the data.

Exhibit 1 Shows the relationship between our dependent variables when ROE is broken apart to its main components.

Our dependent variables allow us to explore three pillars of the financial performance within a company: Profitability (Net Profit Margin), Efficiency (Asset Turnover) and Leverage (Equity Multiplier).

Net Profit Margin

The net profit margin offers a more accurate measure of a company's profitability because it takes total expenses into consideration. Increases in sales don't necessarily reflect profitability. Even if sales revenue increase, if taxes and interest paid on debt also increase it would affect the profitability of a firm. Net profit margin reflects the percentage of income that reveals a company's profit per JPY of sales.

Asset Turnover Ratio

This financial indicator assesses the value of a company's sales compared to the value of their assets. It's commonly used as a meter of efficiency on how good a firm is at using their assets to produce revenue. Typically, a higher asset turnover ratio means a company is operating better because it suggests they are making more revenue per JPY of assets. Asset turnover is usually greater for fast moving consumer goods (FMCG) because they have smaller assets but bigger sales volume. In contrast, companies in sectors like telecommunications or utilities will have larger assets but lower asset turnover ratios.

Equity Multiplier

This is a financial indicator used to assess a company's financial leverage. When a company

buys major assets in can finance them by sustaining debt or issuing stock. A higher equity multiplier means that the company is using more debt than equity to pay for its asset purchases. If the company is running profitably and efficiently using its assets, then the use of a greater level of debt is suitable. Higher profit indicates that management is effectively keeping up with the debt. Debt is usually cheaper than releasing stock in a secondary market so in this instance can be a positive strategy. Nevertheless, a greater equity multiplier suggests the company would burden greater risk if profits fall because they may not be able to fulfill debt and default.

The basic formula for ROA is defined as:

$$ROA = \frac{Net\ Profit}{Total\ Sales} \times \frac{Total\ Sales}{Total\ Assets}$$

In other words, Asset turnover ratio multiplied by Net profit margin. The ROE takes the Equity multiplier into consideration making the new formula as follows:

$$ROE = \frac{Net\ Profit}{Total\ Sales} \times \frac{Total\ Sales}{Total\ Assets} \times \frac{Total\ Assets}{Shareholders\ Equity}$$

Thus, the DuPont framework will allow us to cross-examine Net Profit Margin, Asset Turnover and Equity Multiplier but we include ROA and ROE as provided in the annual reports because we take into consideration any approximation errors by the number of decimals taken to calculate these values.

Sample selection methods for secondary data

Both Independent and dependent variables chosen for this research were collected from years 2013 to 2017. This time span was specifically chosen because it was when Prime Minister Abe Shinzo addressed Japan with the topic of womenomics and challenged the private sector to fill 30% of leadership roles with women. By selecting the period in question, we expect to see the effects of Abe's initiatives reflected in the percentages of women belonging to Japanese boards. The sources were from multiple archival databases listed under PRONEXUS INC. The databased is called EOL and is similar to Standard & Poor's compustat data but offers more details on financial highlights of Japanese companies. EOL archives provide all financial statements for the timespan mentioned above and additionally provides information on the board of directors. Information for each company's board of directors provides the percentage of women in the board for the last two or three years. Older information on the composition of the board was not available as a report so we had to manually go over the names of all the board members and count the female members.

Financial statements and female board member ratios all came from companies that are components of the Nikkei 225 index across 6 industries: Service, Retail, Food, Pharmaceuticals, Banking and Chemicals (Nikkei Index Components, 2018). For the chemical industry the majority of sample companies were not part of the Nikkei 225 index but were rather purposively selected based on archival data from the prominent Japanese financial magazine *Toyokeizai* (Kato C., 2017) because it suggested firms with higher numbers of female representation at the board. Other criteria to select companies at each component industry of the Nikkei 225 was that samples must have at least one woman on the board of directors at least in more than two years of the time period selected. Six companies were selected from six industries for a total of 36 samples each with five years' worth of financial statements and female board member ratios.

We utilized a general-purpose statistics software named STATA developed by StataCorp to run our panel data regressions using a single independent variable and multiple dependent variables. Archival data for financial statements of the sample companies and the percentage of women in the board of directors was summarized in spreadsheets and is available on the appendices section of this study. Details on the analysis will be discussed on the data analysis section.

Primary Data

The primary data for this research was collected through anecdotal evidence of female leaders in Japan who attended the WINConference Japan held in Tokyo on May of 2018. WINConference was founded in 1998 in Milan by Norwegian social entrepreneur Kristin Engvig. It was founded as a women's networking conference and it's held yearly in multiple locations around the world. Usually the participants are academics, executives, NGO representatives or others. WINConference is known to carry out research about women in management and how they balance work/life. During the WINConference in Tokyo a variety of speakers were invited to do plenary sessions and workshops with the participants. By attending the conference in question, we managed to network with prominent female executives in Japanese companies and overseas. Some of these executives agreed to participate in surveys and video call interviews to share their expertise about gender diversity topics related to this research.

Sample selection methods for primary data

During the WINConference we encountered a wide array of female business professionals ranging from middle management to senior management roles at their organizations. Upon exchanging contact information at the event, we contacted several of them requesting a phone interview. The majority of them declined due to schedule constraints but we managed to obtain a video conference call with the Helena Phua, the Asia-Pacific Executive Vice President of the New York Times (Taylor V., 2014) and a phone interview with Naoko Nemoto, Financial Economist of the Asian Development Bank Institute (Asian Development Bank Institute, retrieved on 2018). Additionally, some of the people contacted declined to a call interview but were open to cooperate by filling our survey.

Ms. Helena Phua from New York Times has been elected to the Board of the Society of Publishers in Asia (SOPA), the most prominent media organization in Asia. Her job has brought her on several occasions to Japan for the last 15 years and she is a lifetime honorary member of Les Clefs D'or International from 2016. Ms. Naoko Nemoto from the Asian Development Bank Institute holds an MBA from the University of Chicago and a PhD in Finance from the University of Hitotsubashi in Tokyo. Dr. Nemoto is also an independent director in the board of Chubu Electric Power and Yokohama Bank.

Details on the interview and the survey will be discussed later on the primary data analysis section of this research.

Data analysis results and discussion

Analysis of secondary data

In this part of our research we use a quantitative approach as our analysis tool for the secondary data. For such purposes, panel data regressions are run to test the strength of the relationship between the female executive ratio (independent variable) and our financial ratios (dependent variables). We utilized panel data regressions because the data that we are managing is a combination of time series and cross-sectional data. We mentioned earlier about the five-year span selected for this research (time series data) and the broken components of ROE of several companies (cross-sectional data). Panel data (also known as longitudinal data) is a combination of the data types mentioned above and it collects observations for multiple entities at multiple instances in time (Cheng Hsiao, 2007). Since we have both time series data and cross-sectional data we decided panel data regressions are most suitable for this research to study the dynamics of our variables. When presented with panel data which several observations in each panel, usually the observations in the data set are not all autonomous since attributes of the panel that are not embodied by other variables will normally cause some correlation within panels (or sometimes negative correlation). For such instances, standard errors calculated in a pooled OLS regression model are unsuitable. Instead, a Panel Data Regression model was used for this research.

For our panel data regression, we utilized the Hausman specification test. The Hausman test is a statistical hypothesis test in econometrics that evaluates the stability of an estimator when compared to an alternative less efficient estimator that is previously deemed to be consistent (Hausman, J.A., 1976). This test will help determine if a random effect (RE) or fixed effect (FE) is suitable for our panel data regressions. The criteria to select either effect on our research is as follows:

Null Hypothesis: RE is appropriate (We accept the null hypothesis if probability value of Hausman is greater than 5%)

Alternative: FE is appropriate (We accept the alternative hypothesis if probability value is less than 5%)

Table 1 in appendices details the steps followed to do the Hausman test on our research.

Upon performing the Hausman test we found that RE was most suitable when we analyzed the dependent and independent variables for all entities in our observations (hereby called “first test of panel data regressions” on this research). Meanwhile, the Hausman test when examining our observations individually per industry and each test gave mixed results (RE and FE). For this instance (hereby called “second test of panel data regressions” on this research), we decided to apply FE under the premise that all companies within the same industry behave similarly to some extent and to a certain degree are subject to the same managerial factors that would affect financial performance.

First test of panel data regressions

We input the data of all companies in **Table 2** with their respective time period (Time variable: Years), independent and dependent variables. We utilized STATA to run multiple linear regressions with random effects. Any results where $P > |z|$ is less than 0.05 is considered strongly significant, $P > |z|$ higher than 0.05 and lower than 0.1 is considered moderately significant and $P > |z|$ higher than 0.1 is considered not significant. An ID number was assigned to all companies to identify them in STATA starting from 1 to 36. ID number 31 was used as the base because it was the closest to the mean of female ratio percentages needed to run our data panel regressions with random effects. The test was repeated keeping independent variable “femaleexecutiveratio” fixed and only changing the dependent variables “netprofitmargin”, “assetturnover”, “leverage”, “roa” and “roe” each time we ran a test. **Exhibit 2 (a)** and **(b)** show the results of our first model only for those instances in which $P > |z|$ was strongly significant or moderately significant disregarding if the coefficient was positive or negative.

Exhibit 2 (a) shows a $P > |z|$ of 0.013 when testing the independent variable “femaleexecutiveratio” against “roa” indicating a strong relationship between the variables and a positive coefficient. This suggests that there is a significant relationship between the percentage of women in a board of directors and the ROA of the firm. The result is consistent with Jurkus, Park & Woodard, (2008) where they also find a significantly positive relation between gender diversity and ROA. Jurkus, Park & Woodard, (2008) studied samples from Fortune 500 firms and gender diversity census data obtained by the NPO Catalyst. The results obtained on this model do not explain causality between the variables. However, we have quoted extensive literature like Erhardt, Werbel, Shrader (2003) and Carter et al. (2007)

where they examine performance of big US corporations with gender balanced boards presenting higher stock values and greater profitability. Carter et al. (2007) does point out however, that although typically there is a positive evaluation between diversity and corporate performance, the process in what kind of diversity impacts board performance is complicated and while certain boards may profit from higher gender or racial diversity, others may be unaffected.

Exhibit 2 (b) shows $P > |z|$ of 0.099 when testing the independent variable “femaleexecutiveratio” against “roe” indicating a moderate significance between the variables and a positive coefficient. This suggests there is a moderately significant relationship between the percentage of women in the board of directors and ROE of the firm. The result is consistent with the research done by NPO Catalyst (2011) where they measure gender diversity at the board of Fortune 500 companies and confirmed that those with a higher ratio of female board members showed a higher ROE than those without women at the board.

The results from both exhibits x (a) and (b) were obtained with a different methodology from Jurkus, Park & Woodard, (2008) and NPO Catalyst (2011). Nevertheless, the results are replicable because they follow the theory that an organization with a richer gender diversity leadership has a higher financial performance than those who lack diversity in their senior leadership.

Second test of panel data regressions

We input the data of the companies in **Table 2** but this time it's done individually by industry with their respective time period (Time variable: Years), independent and dependent variables. We utilized STATA to run multiple linear regressions but for this instance we used fixed effects because the female ratios in leadership and financial data from the companies is grouped by industry type and is therefore standardized. The test was repeated keeping independent variable “femaleexecutiveratio” fixed and only changing the dependent variables “netprofitmargin”, “assetturnover”, “leverage”, “roa” and “roe” each time we ran a test for each industry. Due to the large amount of data of these tests we have summarized our findings on **Table 3** and left only the results of the data panel regressions that showed a strong or moderate significance between variables available at the appendices section, **Exhibit 3 (a) ~ (i)**. As in our first test, results where $P > |z|$ is less than 0.05 is considered strongly significant, $P > |z|$ higher than 0.05 and lower than 0.1 is considered moderately

significant and $P > |z|$ higher than 0.1 is considered not significant. Significance of the variables will be highlighted in **Table 3** in green for strong significance, orange for moderate significance and red for no significance between variables. The sign of each coefficient will be written in parentheses next to each value.

Results for the analysis at industry level showed no significance for the majority of industries when analyzed the female ratios at the board and their financial ratios. The only exception where independent and dependent variables showed a strong to moderate significance was the Chemical industry. For the majority of companies within the chemical industry, cosmetic manufacturers were purposively selected because the board of such companies exhibits a high percentage of women. The results are partially consistent with the findings of Jurkus, Park & Woodard, (2008) and Catalyst (2011). To fully confirm consistency with other related researches more samples would be needed to test the validity of the results. For instance, on the first test of our panel data regressions we had a number of 180 observations because we compared all 36 sample companies with a time variable of five years. On the second test however, we had a number of 30 observations with only 6 companies per industry. The limited number of samples per industry on our second test may offer different results if more samples could be collected for the same type of analysis. Limitations for this research will be further discussed in the conclusion section of this research. On the other hand, these results are consistent with the work of Carter et al. (2007) where they point out that not all boards may benefit from a higher gender diversity. Our second tests validate Carter's argument because some industries exhibit no significant relationship while others displayed moderate to strong significant relationships between gender diversity ratios and financial ratios.

dAnalysis of primary data

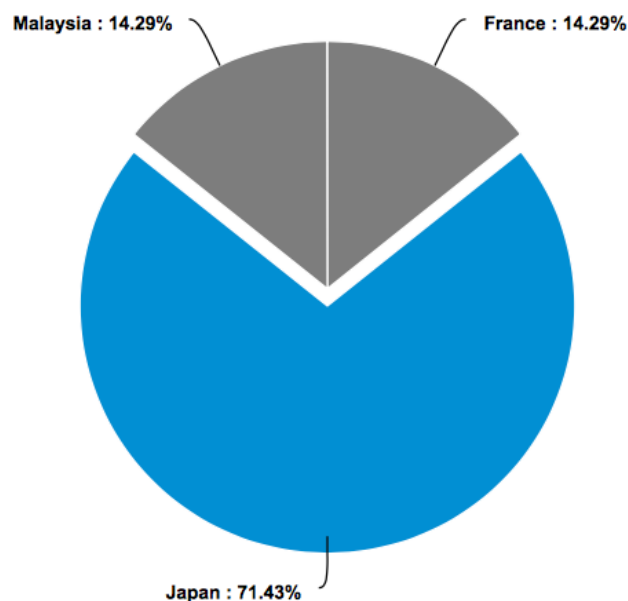
Survey Analysis

We made reference of the research from Kay, A., Miller, R., & Bingham, L. (2016) of EY and utilized some of the same multiple-choice questions in our survey while adding one open ended question at the end to obtain insight from each of the participant's own experience and expertise. We utilized a free survey design tool called Survey Analytics® available online to capture the answers of our survey. The 10 questions and responses obtained by the participants:

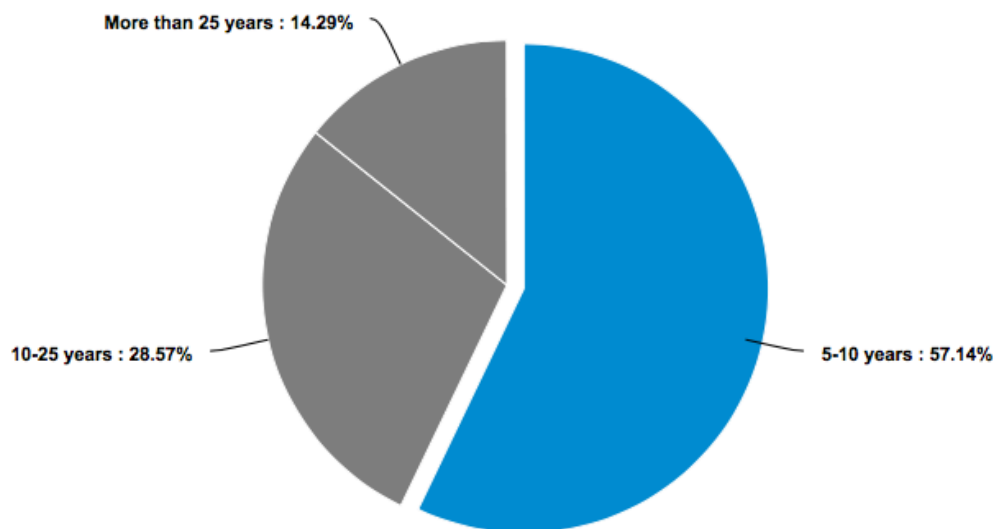
Q1. Please provide your first/last name, company name and position

Contact Information		
05/17/2018	16468167	Miho Yamaguchi IBM Consulting Sales Specialist
05/16/2018	16467598	Naoko Nemoto Asian Development Bank Institute Economist
05/15/2018	16466786	Helena Phua NYT Executive Vice President / Publisher of Chinese Magazine
05/15/2018	16466703	Kaori Ohsumi IBM
05/15/2018	16466156	Kiyo Ogushi Fuji Xerox Learning Institute, Inc. President & CEO
05/14/2018	16465897	Sarah Goretta Sumitomo Chemical Deputy Manager
05/14/2018	16465895	Chisa Ogura Meros Consulting Managing Director

Q2. What is your nationality?

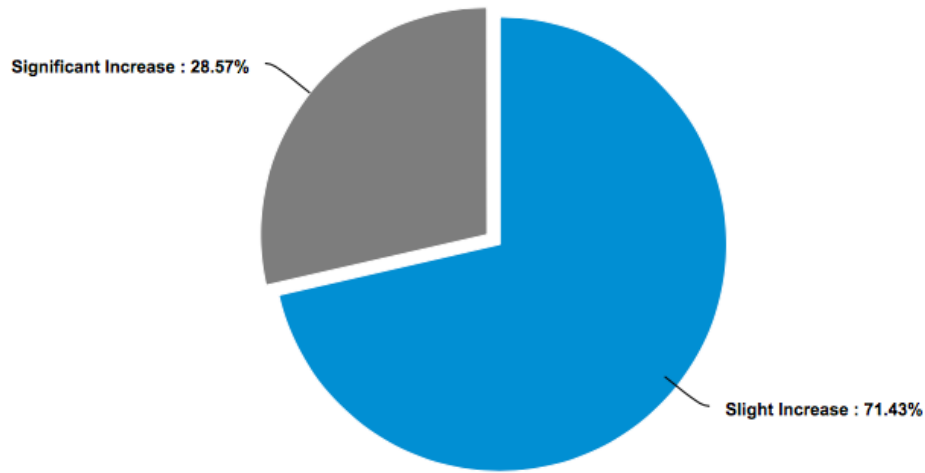


Q3. How many years do you think it will take organizations in Japan to reach 30% of women in leadership roles?



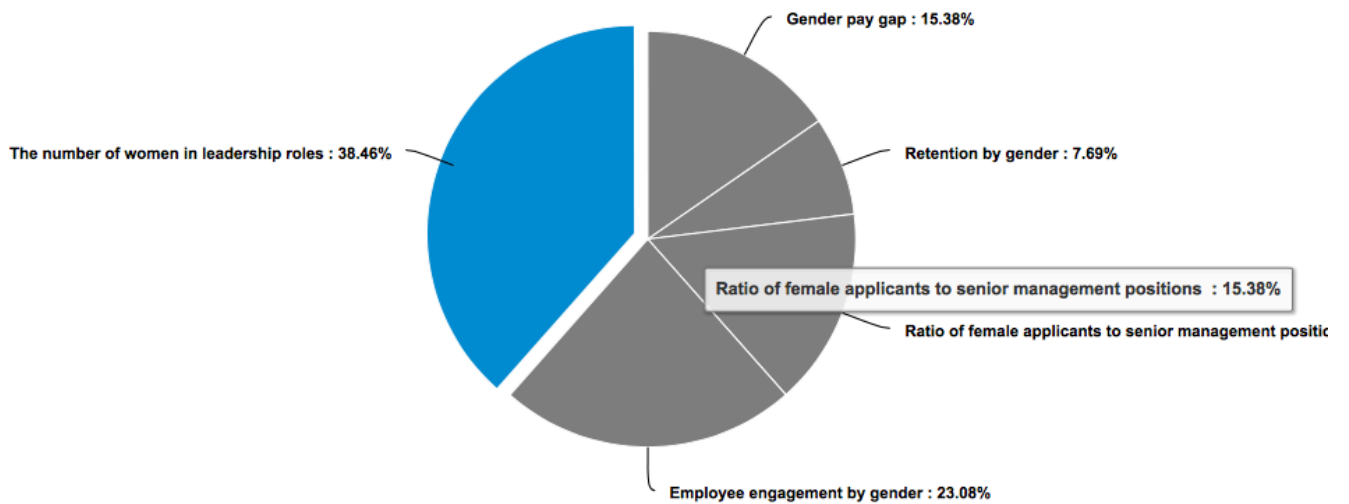
Answer	Count	Percent	20%	40%	60%	80%	100%
2-5 years	0	0%					
5-10 years	4	57.14%					
10-25 years	2	28.57%					
More than 25 years	1	14.29%					
Never	0	0%					
Total	7	100 %					

Q4. What changes do you expect over the next five years to the number of women in leadership positions in Japan?



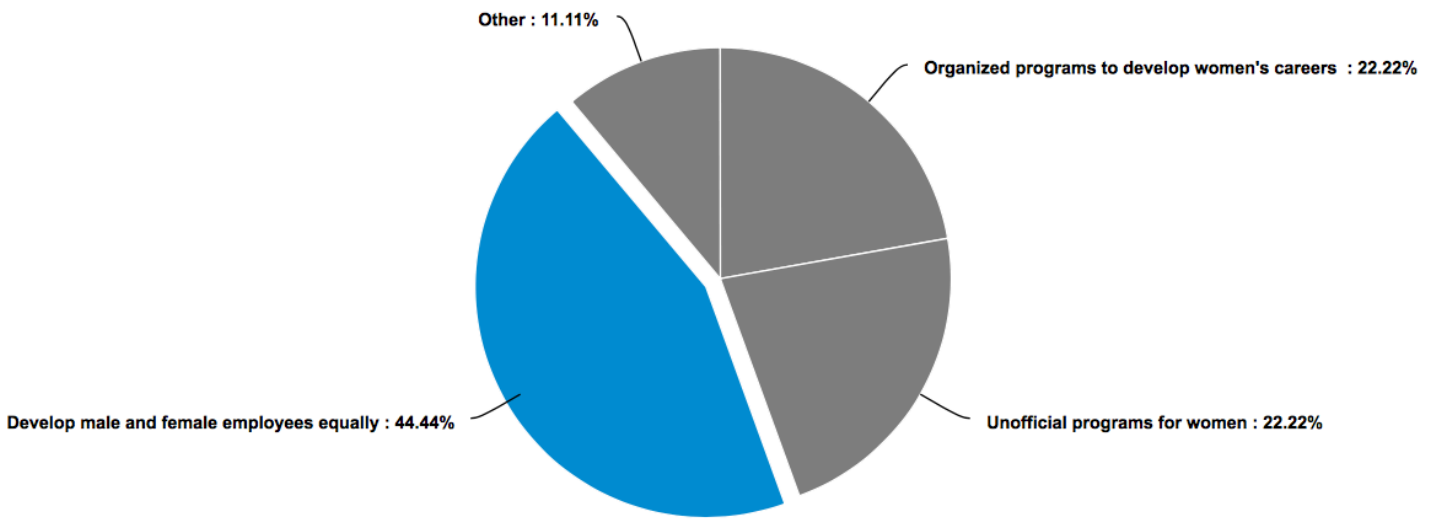
Answer	Count	Percent	20%	40%	60%	80%	100%	
No change	0	0%						
Slight Increase	5	71.43%	[Progress bar to 71.43%]					
Significant Increase	2	28.57%	[Progress bar to 28.57%]					
Total	7	100 %						

Q5. What are the gender related metrics that are normally measured in your organization?



Answer	Count	Percent	20%	40%	60%	80%	100%
Gender pay gap	2	15.38%	<div style="width: 15.38%;"></div>				
Retention by gender	1	7.69%	<div style="width: 7.69%;"></div>				
Ratio of female applicants to senior management positions	2	15.38%	<div style="width: 15.38%;"></div>				
Employee engagement by gender	3	23.08%	<div style="width: 23.08%;"></div>				
The number of women in leadership roles	5	38.46%	<div style="width: 38.46%;"></div>				
Other	0	0%	<div style="width: 0%;"></div>				
Total	13	100 %					

Q6. How is female talent developed in your organization?

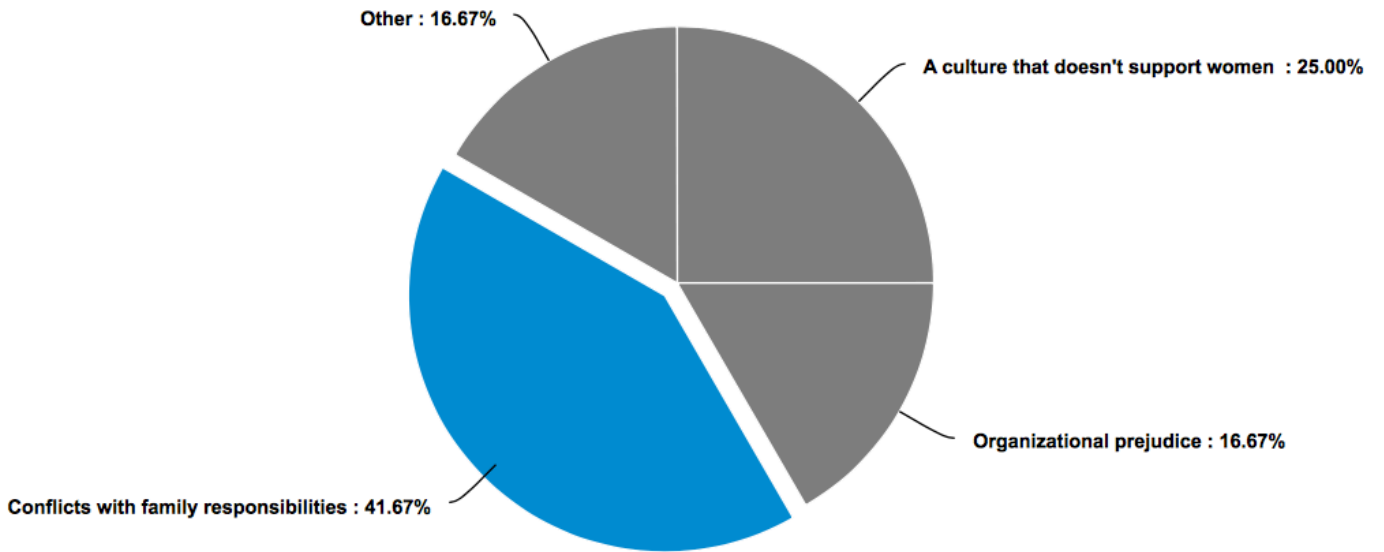


Answer	Count	Percent	20%	40%	60%	80%	100%
Organized programs to develop women's careers	2	22.22%	<div style="width: 22.22%;"></div>				
Unofficial programs for women	2	22.22%	<div style="width: 22.22%;"></div>				
Develop male and female employees equally	4	44.44%	<div style="width: 44.44%;"></div>				
Other	1	11.11%	<div style="width: 11.11%;"></div>				
Total	9	100 %					

How is female talent developed in your organization? - Text Data for Other

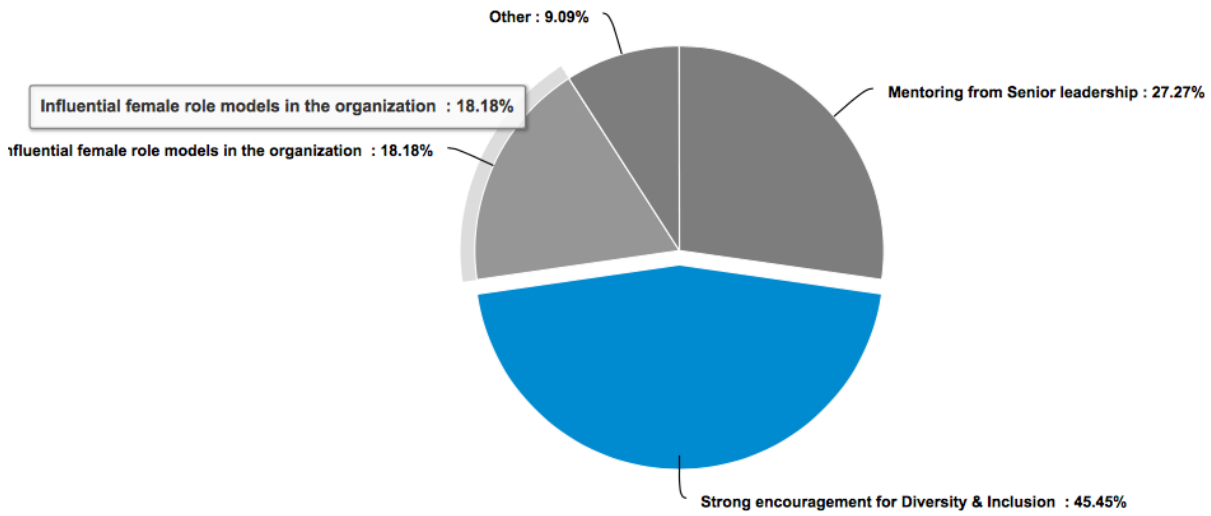
05/14/2018	16465897	Very specific and targeted programmes for women seen as "promising" who are hand-picked by HR, not accessible to all.
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Q7. What are the biggest challenges for Japanese women in leadership roles?



Answer	Count	Percent	20%	40%	60%	80%	100%
A culture that doesn't support women	3	25%	<div style="width: 25%;"></div>				
Organizational prejudice	2	16.67%	<div style="width: 16.67%;"></div>				
Conflicts with family responsibilities	5	41.67%	<div style="width: 41.67%;"></div>				
Lack of capable female candidates	0	0%	<div style="width: 0%;"></div>				
Other	2	16.67%	<div style="width: 16.67%;"></div>				
Total	12	100 %					
What are the biggest challenges for Japanese women in leadership ? - Text Data for Other							
05/15/2018	16466156	women's ambition					
05/14/2018	16465897	A culture that doesn't support women in the professional corporate sphere.					




Q8. What are the biggest enablers for supporting women on leadership roles in Japan?



Answer	Count	Percent	20%	40%	60%	80%	100%
Mentoring from Senior leadership	3	27.27%	[Progress bar]				
Strong encouragement for Diversity & Inclusion	5	45.45%	[Progress bar]				
Influential female role models in the organization	2	18.18%	[Progress bar]				
Other	1	9.09%	[Progress bar]				
Total	11	100 %					

Q9. How do you rank the benefits for organizations from having more women in middle to senior leadership roles? Please rank (1-8) the following statements in order of relevance.

	Average Rank	1	2	3	4	5	6	7	8	
Organizations become more profitable	3.83	[Progress bar]								
Organizations become more innovative	2.0	[Progress bar]								
Organizations become more attractive to investors/shareholders	5.67	[Progress bar]								
Organizations become more attractive for new candidates looking for jobs	3.43	[Progress bar]								
Organizations have stronger business ethics	3.5	[Progress bar]								
Organizations become more engaged in Corporate Social Responsibility (CSR)	6.5	[Progress bar]								
Organizations can retain more talent	4.5	[Progress bar]								
Organizations become more efficient in operations and managing assets	5.71	[Progress bar]								

Organizations become more innovative	2	
Organizations become more attractive for new candidates looking for jobs	3.43	
Organizations have stronger business ethics	3.5	
Organizations become more profitable	3.83	
Organizations can retain more talent	4.5	
Organizations become more attractive to investors/shareholders	5.67	
Organizations become more efficient in operations and managing assets	5.71	
Organizations become more engaged in Corporate Social Responsibility (CSR)	6.5	

Q10. What specific recommendation(s) would you give Japanese organizations to increase the number of women in corporate leadership roles?

05/17/2018	16468167	Women need men's support especially from her husband in the family.
05/16/2018	16467598	When I talked with young female staff, they are afraid that they will lose personal life given current long working hours in Japan. Work style reform and more efficiency is important. In addition, the company should provide training, coaching and program to encourage women unless the gap is resolved.
05/15/2018	16466786	Having more women in leadership role with stronger and balance voice and opinion, will create a much more interesting workplace and environment Is simply not just for the women but for men and for younger employees. This will mean better company performance and results, and create higher shareholders and investors value.
05/15/2018	16466703	何%以上の女性雇用がないと税金が増える、など罰則規定のある制約を与えないと増えないと思う。
05/15/2018	16466156	Equal opportunity to challenge for the role Get rid of unconscious bias Motivate women to challenge with ambition Select women pool for future leaders in personnel system
05/14/2018	16465897	More women in leadership roles must come from deep and sustainable change in middle management and I would recommend hiring more non-Japanese managers as gender discrimination tends to disappear when put next to cultural challenges.
05/14/2018	16465895	To set a target number, and to make the company to meet the number even if they do feel they do not have enough "capable" female candidates. I think the responsible position will grow people.

Analysis of Q1

We requested participation from close to 30 attendants of WINConference Japan 2018 and obtained 7 respondents for the survey. Despite the low figure the sample subjects are in senior leadership positions in their organizations and some are even members in multiple boards of Japanese firms. Respondents belonged to Japanese companies, multinational companies based in Japan or multinational firms operating overseas.

Analysis of Q2

More than 70% of participants were from Japan. The remaining are from Europe and Southeast Asia. Our research addresses gender diversity and financial performance in Japan so we see the majority of participants as a relevant parameter. However, the non-Japanese respondents have either lived in Japan for multiple years or visit Japan often on business trips so they have a good grasp of Japan's gender diversity in the public and private sector.

Analysis of Q3

Groysberg, Yamazaki, Sato and Lane (2017) describe in their study about the 30 percent goal that Prime Minister Abe did back in 2012. This question measures the sentiment of prominent female business figures in Japan on the efforts being done in the public and private sector to achieve the goal. Initially Abe aimed to achieve 30 percent of women in leadership roles by 2020 but none of the respondents' response suggests that it will. Toyokeizai and the Japanese gender equality bureau cabinet office estimate the figure to be 3.7 percent as of 2017 (Gender Equality Bureau Cabinet Office, Retrieved on 2018) . Nearly 54 percent of the respondents answered that it will take 5 to 10 years to achieve the goal. On Toyokeizai and the gender equality bureau's most recent report it was learned that the goal had been revised to 10 percent by 2020.

Analysis of Q4

This is a complimentary question to Q3 and aimed to measure sentiment on the efforts Japan is doing to empower women in leadership roles. More than 70 percent of respondents answered that in the next five years there will be a slight increase in women occupying leadership roles. The remaining 30 percent showed a more optimistic response by suggesting the figure will significantly increase.

Analysis of Q5

Women in leadership roles seems to be the metric that is most measured among the respondent's organizations followed by employee engagement by gender. We left an "Other" option available to see if the respondents could offer other gender diversity related metrics

measured within their organizations but there were none. Prusak (2014) suggests that what can't be measured can't be managed. Nearly 40 percent of respondents confirmed that gender diversity in leadership is properly measured. A limitation collecting data for this research was the lack of transparency in gender diversity metrics. Based on anecdotal evidence of plenary sessions at WINConference Japan 2018, the disclosure of gender diversity at board level of Japanese companies became compulsory between 2014 and 2015 according to the gender equality bureau of Japan so many companies have just started releasing them recently. Additional anecdotal evidence from WINConference attendants suggests that a form of incentive or penalty for disclosure of gender diversity figures may encourage Japanese companies to display more transparency with gender diversity figures at leadership level. At the moment, only female ratios at the board are compulsory while other senior leadership roles' disclosure is at the firm's discretion.

Analysis of Q6

More than 40 percent of respondents answered that the most common form of talent development for women is development for both male and female employees equally. The answers on this question are consistent with the work of Kay, A., Miller, R., & Bingham, L. (2016) in which a majority of their respondents answered the same option. In their work they point out that is not so much gender-specific training but a more objective evaluation aimed at identifying promising candidates (men or women) who have promising skills without any gender bias. This ensures male and female employees are given equal opportunities for career progression. The remaining respondents mention that female development is done through well-structured programs aimed to develop women's careers or unofficial programs for women. During WINConference we asked during the multiple workshops if their organizations had some sort of program aimed specifically to train women and the majority could only articulate programs for women coming back from maternity leave and no female leadership programs. Other anecdotal evidence from the same workshops suggested that the unofficial programs for women were in part to avoid a perception of preferential treatment towards women from their male counter parts. A little more than 11 percent of the respondents who answer "Other" in our survey said that talent was developed through very specific and targeted programs aimed at promising candidates and are handpicked by human resource staff. By far the most predominant answer for both Kay et al (2016) and our survey was an equal opportunity for both men and women.

Analysis of Q7

The majority of our respondents answered that the biggest difficulty of Japanese women in leadership roles were conflicts with family responsibilities (More than 40 percent). Female respondents in Kay et al (2016)'s study pointed to a culture that doesn't support women and organizational prejudice as the main barriers for female leadership development. The option "A culture that doesn't support women" ranked second with 25 percent and options "Organizational prejudice" and "Other" ranked third with nearly 17 percent of respondents. None of the respondents answered "Lack of capable female candidates". The results of this question are consistent with the figures released by the gender equality bureau's annual report on men and women in Japan. According to Japan's gender equality bureau, engagement from men in house chores and child care is one of the lowest around the world. There is a significant difference in the time spent on housework and child care between men and women in Japan.

Analysis of Q8

Nearly 45 percent of respondents agree that strong encouragement for diversity and inclusion in an organization is one of the biggest catalyzers to advance women to leadership roles followed by nearly 27 percent of responders who suggest mentoring from senior leadership is what empowers women for career progression to leadership roles. The results are opposite to the findings of Kay et al (2016) where more than 50 percent of women affirm that mentoring from senior leadership is the biggest enabler for advancing women to leadership roles. The limitation in number of samples to our survey may be a factor to the results but we can agree that a mixture of both an environment that encourages diversity and inclusion combined with mentoring to female candidates with potential helps female career progression to leadership positions.

Analysis of Q9

The top three ways in which respondents believe organizations would benefit from having more women in middle to senior leadership roles were ranked as organizations becoming more innovative as number one, organizations becoming more attractive for prospective job seekers as number two and organizations with stronger business ethics as number three. The results are consistent with the study from Dezso and Gaddis Ross (2011) where it was found that increasing women in leadership roles increases performance in innovation-oriented related companies. Liswood (2015) implies an improvement on business ethics by adding

women to the board of directors because heterogeneity brings benefits like better behavior in male members, systematic and orderly board work, higher quality of guidance and monitoring to management. It is thus implied that higher female representation at the board creates a culture of compliance and ethics.

Analysis of Q10

Respondents were asked in an open-ended question what would help Japanese organizations increase female representation in leadership roles and their responses vary based on industry, nationality and seniority at their belonging organizations. Most Japanese respondents answered with statements suggesting a reform in the Japanese work style known for its long hours. This answer is consistent with the 2018 annual release of the Japanese gender equality bureau and their figures about the proportion of full-time workers exceeding 60 hours or more per week. A French national respondent working in a leadership position at a Japanese firm suggested as anecdotal evidence and as response to our survey, that increasing the number of non-Japanese leaders dissolves gender bias because racial diversity demands the same level of tolerance as gender diversity. Other responses included more practical approaches such as setting internal goals of gender diversity and liability with incentives or penalties for firms to meet the quota of female talent in leadership positions.

Interview Analysis

Helena Phua, Asia-Pacific Executive Vice President of the New York Times

Below is a summary of a call with Helena recorded on May 16th, 2018:

What are the struggles someone in your career have faced as a woman in a leadership role?

- It was a struggle because not many women in senior positions in Asia
- Helena argues that at the end of the day female empowerment comes down to the individual making decisions on who is the next candidate for promotion. If this is a man it depends on their upbringing (Whether they have a wife, daughters, sisters, etc). Their perceptions on women are different if their wife works.
- Helena was once asked by a Korean executive what her husband thought of her working and not staying at home serving him. This was a shocking question that implies the situation of perception of women in leadership positions in Asia.
- Ever since the COO of NYT (a female executive) came to leadership, it had an effect by increasing the number of female leaders at NYT.

We asked what she considers to be benefits for organizations to have more female leaders

- Helena states that bringing women to leadership compliments talented male leaders' IQ (Intellectual quotient) with a female leader's EQ (Emotional quotient). She believes women bring balance to an organization and makes an analogy on how a child receives the influence from mother and father.
- Purchasing decisions for consumers usually involves consulting a woman. She illustrates how in a household, men would have to consult their wives to make big purchases or even trivial purchases. It is for this reason that having women in leadership is beneficial because their input takes into consideration the needs of consumers. By this she is implying how the balance of men and women in leadership enhances innovation.
- The purchasing decision in men is highly affected by the opinion for the wife even though they have the financial means to make the purchase.

We briefly mentioned Womenomics and Japan's female leadership goals for the public and private sectors and requested what advise she would offer Japan to increase women in leadership roles.

- Helena suggests that Japanese women get domestic help. Young women need it to take care of the children and more mature women have aging parents that may need nursing care. She quotes an anecdote of a capable female advertiser director based in Japan who left NYT because she needed to look after her older parents. Organizations should guarantee that a woman is able to take the necessary time away from work to look after family and have a guaranteed reinstatement to her previous position in her organization. This would encourage more women to continue working longer and to return to work after maternity leave or other family obligations. This is why domestic helpers come in handy (Specially for the shortage of child day care centers in the metropolitan areas of Japan and also to the difficulty that it poses to travel with young children in a full train during rush hour when parents commute to work).

Interview analysis

Helena's interview mentions a lot of issues regarding conflicts with family responsibilities and suggests that women's leadership adds diversity to organizations and thus enhances innovation. We can affirm that these statements are consistent with the survey results of this study and also with the research from Kay, Miller & Bingham (2016) on conflicts with

family responsibilities as a barrier for female leadership advancement and with the findings of Dezsö, C. L., & Ross, D. G. (2012) on how women in leadership are found to enhance firm performance by improving innovation. Mrs. Phua points out how women have a strong influence on purchasing decisions in a household, arguing that more women in leadership roles of consumer-oriented business can benefit from women's EQ because they understand the psychology of women in the decision-making process in a household. These statements are in line with anecdotal evidence from WINConference where Erika Shirai (General Manager of diversity for Nissan Motors) explains about how women have a saying when men come to come to car dealers to purchase vehicles. Helena's comments on Domestic help in Japan are not culturally rooted in Japanese society but given the evidence provided by the gender of equality bureau, the lack of support from Japanese men with child care and house chores leaves the topic of domestic workers open for debate.

Naoko Nemoto, Financial Economist of the Asian Development Bank Institute, PhD,

Independent Director at Chubu Electric & Yokohama Bank

Why is female representation in Japanese boards so low?

- Most of the board members are in their 40's or 50's (implying that they are "old fashioned" and don't embrace gender diversity)
- The equal employment opportunity law in Japan was passed in 1985 and implemented in 1986 so up until then there were few opportunities for women to work besides public servant positions or supporting roles (Secretary or assistant). The career paths were different (Implying that the lack of experience and opportunity has resulted in a shortage of female presence in the boards of corporate japan)
- Another reason is because Japanese women had to quit their jobs early in their careers to have children so that left a blank in their careers (She made reference to the Japanese "M Curve"). Even the ones that decided not to have children quit or left to multinational companies because of the bad treatment towards women received in Japanese companies.

There is very little information disclosed on gender diversity in Japanese companies.

Why do you think that is?

- The scope of disclosure is voluntary to some extent so some companies are reluctant to make this information public.

- The Government Pension Investment Fund (GPIF) (Government Pension Investment Fund, 2018) adopted the Morgan Stanley Capital International (MSCI) Japan Empowering Women Index (MSCI Japan Empowering Women Index, 2018). MSCI Japan Empowering Women Index scores Japanese companies on gender diversity related criteria (Implying that there is an incentive now for companies to disclose gender diversity metrics and reaching gender diversity targets).

We asked Dr. Nemoto if there were other reasons why women were underrepresented in leadership roles at Japanese firms

- Japanese women have a low self-esteem because they under-evaluate themselves. They don't believe in themselves because there are too few female role models to follow.
- Dr. Nemoto is an independent director at Chubu Electric and Yokohama bank and after talking to a lot of young employees they tell her concerns about work/life balance. They see how their male managers work long hours so if they are promoted to leadership roles they feel they will be required to work long hours too so they are reluctant to sacrifice their work/life balance.
- Dr. Nemoto shared an anecdote that having a domestic worker at home helped her balance her work when her children were younger. This point was relevant because in Japan there has been a lot of debate about flexing immigration policy to welcome foreigners to work as nursing professionals.

What are the benefits of having higher female representation in the board of directors?

- There were no immediate benefits mentioned so we tried to give an example based on our literature suggesting that boards with more women had a culture of compliance and higher business ethics. Dr. Nemoto responded that indeed in one of the boards where she is a member there was a female auditor that had very strict standards for business ethics so she agreed on this point. She also made reference that issues like sexual harassment are better handled/prevented if women are involved.
- Dr. Nemoto mentioned an example of Japan Railway and how one of their female operating officers of the board came up with the idea of ecute (a convenient retailer usually spotted inside busy train stations in Tokyo), suggesting that adding female board members leads to innovation.

- On this research we struggled to find firms with many women on their boards with the exception of chemical/cosmetics manufacturers.

Do you think female representation in firms varies depending on the industry?

- Dr. Nemoto agrees and says that industries related to science and technology where there are lots of engineers are less likely to have women in leadership. However, the majority of men who are in these companies are struggling with finding potential successors because they are close to retirement and given the shortage of talent are currently considering women in leadership roles.

What should Japan do to encourage more women in senior leadership roles?

- The public sector should lead by example. If more prominent figures are placed in senior leadership positions in the government then the private sector will follow.

Interview analysis

The first question inquiring about the reason why Japanese women are underrepresented in leadership roles is consistent with the work of Witt (2017) where it is stated that gender equality is constitutionally guaranteed but poorly developed in Japan. When inquiring on other reasons for the current underrepresentation of Japanese women in leadership roles Dr. Nemoto pointed out at the pressure they feel indirectly by their male supervisors because they work long hours a day so they assume that if they are promoted to similar leadership roles the same will be expected of them. This answer is consistent with the statistics of 2018 annual release of the Japanese gender equality bureau and their figures about the proportion of full-time workers exceeding 60 hours or more per week. Dr. Nemoto also mentions about how she had a domestic worker helping her when her children were younger. Helena Phua from NYT also points out at the need for domestic workers in her interview. Anecdotal evidence of plenary sessions at WINConference also mentioned the need for domestic workers in Japan, particularly Tokyo's metropolitan area because although there has been an increase in child day care centers, parents describe the difficulty of using public transportation with small children during rush hour. The episode of Japan Railway and the idea of the ecute retailer inside busy train station serves as another validation to the work of Dezsö, C. L., & Ross, D. G. (2012) where it is argued that women in leadership roles help increase innovation at their organizations. Dr. Nemoto offers many other practical recommendations about female

leadership advancement in Japan but perhaps the most valuable information provided was regarding the GPIF willingness to address Environmental Social and Governance(ESG) issues in investment activities by adopting the MSCI Japan Empowering Women Index. ESG refers to a set of guidelines for a firm's operations that socially aware investors use to examine potential investments (Fontinelle A., 2018). MSCI Japan Empowering Women Index is a part of the MSCI ESG index and it seeks to represent the performance of companies that promote and maintain gender diversity and at the same time achieve certain quality standards. MSCI Japan Empowering Women Index claims that companies that are consistent at promoting and maintaining higher levels of gender diversity in their pool of talent are better positioned to endure shortages in talent and create more sustainable performance with lower risk. Since the Japanese government has set specific goals to encourage women's participation and promotion, Japanese institutional investors may have bestowed interest in backing up these goals as companies that promote women empowerment are more likely to endure adversities in the face of shrinkage in their pool of talent. MSCI ESG offers Japan Workforce Gender Diversity Data, enabling its members to access their factsheet. This data helps banks, insurers and institutional investors screen a firm's performance in gender diversity to help advise their investment, financing and underwriting decisions. Examples of factors evaluated by the MSCI ESG index are the average years employed by the company for female employees, gender diversity performance scores, number of newly hired female employees and the number of women in the board of directors.

Conclusion

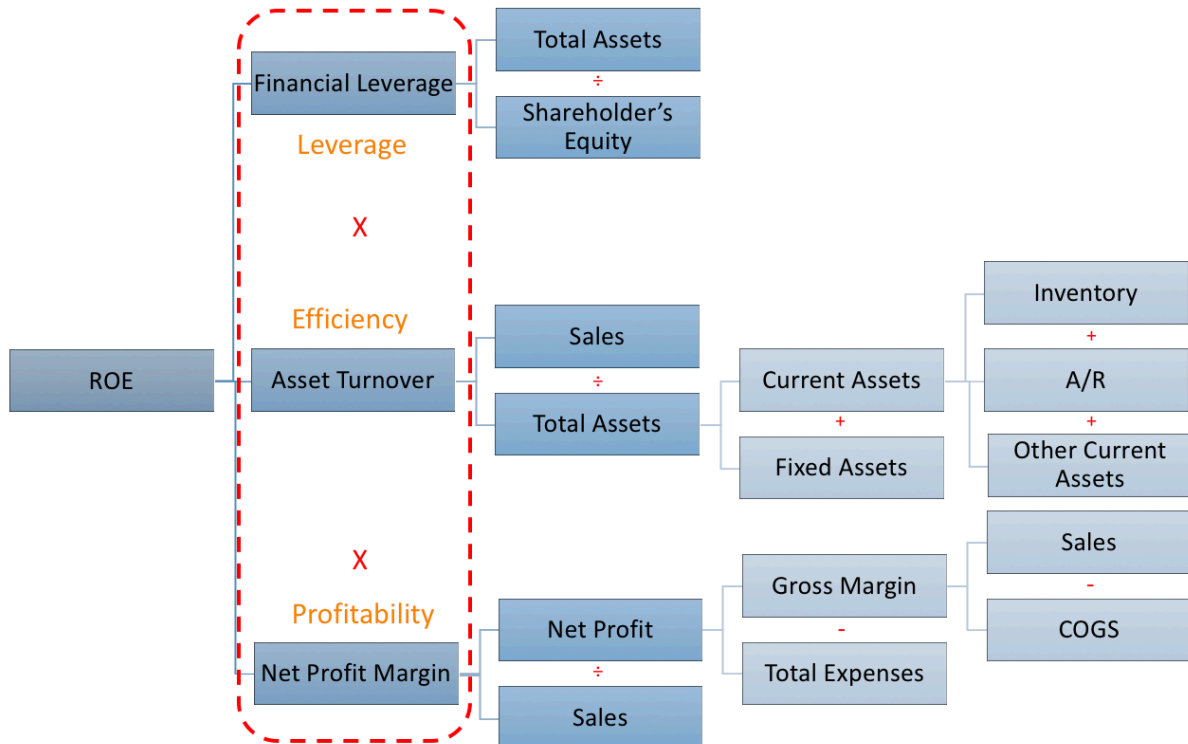
Panel data regression results on our research reveal that dependent variables ROA and ROE show a strong significance and moderate significance respectively with independent variable designated by the percentage of women in the board of Japanese companies. The remaining dependent variables for this study; namely net profit margin, asset turnover and leverage showed no significance with the independent variable. For the second test where each industry was examined separately the results showed no significance for the majority of industries with the exception of cosmetics manufacturer companies where every dependent variable showed a strong significance with a positive or negative coefficient. Our results are partially consistent with the catalyst (2011) and show to some extent that more women in the board of directors does result in better financial performance but it does not explain causality. The biggest limitation for this research was the scarcity in number of samples which is rooted on the lack of disclosure by Japanese companies to share the number of women in their boards and the ones that do, barely have one woman or none. When collecting data for the independent variable we measured female presence as the percentage of women in the board. However, at times the number of women remained fixed for years and the only changes were in male board members joining or leaving the board. Thus, the presence and influence of women in the board and consequentially the impact on financial performance is minimal. Studies like Catalyst (2011) used Fortune 500 companies where they had rich archival data of companies which sometimes had more than three women in the board. Primary data obtained by surveys and interviews of prominent female business leaders suggest that the reason companies with more women in leadership perform better is because they enhance innovation, they attract new talent and they help create a culture of compliance and high business ethics in the board. Another objective of this study was to determine if higher transparency in gender diversity figures of Japanese companies improved financial performance. At this point in the ongoing efforts of Japan to empower women is inconclusive because there is not enough data to validate it. As of 2017 the MSCI Japan Empowering Women Index was launched with the objective to assist institutional investors, banks and insurers for potential investment, financing or underwriting transactions. The Government

Pension Investment Fund (GPIF) now requires the MSCI Japan Empowering Women Index when considering potential investments. What that means is that companies that are transparent in their gender diversity metrics and meet the require standards could be screened as attractive investments and thus improve their financial performance. The last research question we studied was regarding the biggest barriers for women in Japan for leadership advancement. Through secondary and primary data were able to confirm that conflicts with family responsibilities and work was the biggest hurdle for women in leadership roles. During our interviews we asked female senior business leaders for recommendations on how Japan should support women and they suggested a reform in the work style of Japanese companies allowing more flexible working hours to attend family responsibilities. Some of them suggested the encouragement of domestic workers as a solution for the shortage of child day care centers and the hurdles related to using congested public transportation with small children. The recommendations suggested in our findings are consistent with some of the recommendations of Matsui et al (2014). Further research is suggested on how to standardize the format of disclosure for gender diversity metrics in the financial statements of enlisted Japanese companies. This would allow collection of more gender diversity samples and open the way for many forms of research in Japan about the relationship between diversity and overall business performance.

Appendices

Exhibit 1 – DuPont Framework.

DuPont Framework



Note: The diagram shown above was built based on the financial concepts explained in Investopedia.

Source: Investopedia, <https://www.investopedia.com/terms/d/duPontanalysis.asp>, accessed July 2018

Table 1 – Hausman Specification Test

Independent variable	Dependent variable	Probability value of Hausman (Prob)	Hypothesis test
femaleexecutiveratio	netprofitmargin	0.8079	Prob > 0.05, accept Ho (Null)
femaleexecutiveratio	assetturnover	0.0900	Prob > 0.05, accept Ho (Null)
femaleexecutiveratio	leverage	0.1542	Prob > 0.05, accept Ho (Null)
femaleexecutiveratio	roa	0.4058	Prob > 0.05, accept Ho (Null)
femaleexecutiveratio	roe	0.1758	Prob > 0.05, accept Ho (Null)

Description:

In STATA we first run the panel data regressions with both re and fe. At the end of each regression we use a command to store re and fe in the system respectively. Utilizing a command to run the Hausman test with the stored values of re and fe. The Hausman test results show as follows:

---- Coefficients ----

(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
fe	re	Difference	S.E.
[Values for each coefficient go in this line]			

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

$$\chi^2(1) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

Prob>chi2 = [If Prob>Chi2, accept Null Hypothesis Ho]

 We ran the Hausman Test for all of our panel data observations and all variables. All Null Hypothesis were accepted so we used Random Effects for our panel data regressions. A similar methodology was used for the second test of panel data regressions addressed in this research where each industry is cross-examined independently but the results were mixed. Some accepted Ho (Null) and others Ha (Alternative). We therefore decided to use Fixed Effects on the second test due to the similarity of companies that belong to the same industry.

Exhibit 2 (a) – Panel Data regressions result: Female executive ratio vs ROA

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg roa femaleexecutiveratio ib(31).id, re						
Random-effects GLS regression			Number of obs = 180			
Group variable: id			Number of groups = 36			
R-sq:			Obs per group:			
within = 0.0412			min = 5			
between = 1.0000			avg = 5.0			
overall = 0.7150			max = 5			
Wald chi2(36) = 358.84						
corr(u_i, X) = 0 (assumed)			Prob > chi2 = 0.0000			
roa	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Femaleexecutiveratio	.1078299	.0434789	2.48	0.013	.0226129	.193047
ID						
1	1.659145	1.739225	0.95	0.340	-1.749675	5.067964
2	-.3844395	1.824135	-0.21	0.833	-3.959679	3.1908
3	1.259561	1.824135	0.69	0.490	-2.315679	4.8348
4	1.348898	1.81664	0.74	0.458	-2.21165	4.909447
5	8.326178	1.776842	4.69	0.000	4.843632	11.80872
6	2.515055	1.817078	1.38	0.166	-1.046353	6.076463
7	.6190415	1.839846	0.34	0.737	-2.98699	4.225073
8	1.045579	1.735491	0.60	0.547	-2.355921	4.447079
9	11.70596	1.746036	6.70	0.000	8.283795	15.12813
10	12.24256	1.637753	7.48	0.000	9.032627	15.4525
11	3.018017	1.848529	1.63	0.103	-.6050324	6.641066
12	6.72454	1.762367	3.82	0.000	3.270365	10.17872
13	1.952254	1.723062	1.13	0.257	-1.424885	5.329394
14	2.745928	1.741106	1.58	0.115	-.6665773	6.158433
15	7.674433	1.747182	4.39	0.000	4.250018	11.09885
16	2.477552	1.775212	1.40	0.163	-1.0018	5.956904
17	1.544013	1.731792	0.89	0.373	-1.850238	4.938263
18	3.343033	1.789652	1.87	0.062	-.1646208	6.850686
19	4.809995	1.819715	2.64	0.008	1.243418	8.376571
20	.9279407	1.915688	0.48	0.628	-2.826738	4.682619
21	5.311248	1.823249	2.91	0.004	1.737745	8.88475
22	3.042348	1.756856	1.73	0.083	-.4010256	6.485722
23	6.268299	1.628121	3.85	0.000	3.077241	9.459358
24	2.965198	1.8403	1.61	0.107	-.6417241	6.572121
25	-.7938712	1.792588	-0.44	0.658	-4.307279	2.719537
26	-.3420458	1.890591	-0.18	0.856	-4.047536	3.363445
27	-.1302159	1.915189	-0.07	0.946	-3.883917	3.623485
28	-1.35026	1.679185	-0.80	0.421	-4.641403	1.940883
29	-.5696565	1.826357	-0.31	0.755	-4.149251	3.009938
30	-.772314	1.750254	-0.44	0.659	-4.20275	2.658121
32	-3.799685	2.207657	-1.72	0.085	-8.126613	.5272427
33	2.565552	1.629993	1.57	0.115	-.6291747	5.760279
34	.4714628	1.584221	0.30	0.766	-2.633554	3.576479
35	6.075069	1.571853	3.86	0.000	2.994295	9.155844
36	5.529297	1.806641	3.06	0.002	1.988345	9.070248
_cons	.2445695	1.656122	0.15	0.883	-3.001371	3.49051
sigma_u	0					
sigma_e	2.4807948					
rho	0 (fraction of variance due to u_i)					

Description of Exhibit 2(a)

We performed a panel data regression with random effect as suggested by our initial Hausman test. The data consists of 180 observations and 36 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance ($P > |z|$ of 0.013) with positive coefficient for the dependent variable representing ROA. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of ROA in the firm.

Exhibit 2 (b) – Panel Data regressions result: Female executive ratio vs ROE

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg roe femaleexecutiveratio ib(31).id, re						
Random-effects GLS regression			Number of obs = 180			
Group variable: id			Number of groups = 36			
R-sq:			Obs per group:			
within = 0.0186			min = 5			
between = 1.0000			avg = 5.0			
overall = 0.5278			max = 5			
Wald chi2(36) = 159.82						
corr(u_i, X) = 0 (assumed)			Prob > chi2 = 0.0000			
roe	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Femaleexecutiveratio	.12567	.0762428	1.65	0.099	-0.0237633	.2751032
id						
1	1.765063	3.049838	0.58	0.563	-4.212508	7.742635
2	-2.038663	3.198732	-0.64	0.524	-8.308063	4.230738
3	1.057337	3.198732	0.33	0.741	-5.212063	7.326738
4	1.040609	3.185588	0.33	0.744	-5.203029	7.284247
5	9.52835	3.1158	3.06	0.002	3.421493	15.63521
6	3.657123	3.186357	1.15	0.251	-2.588022	9.902268
7	8.567306	3.226282	2.66	0.008	2.24391	14.8907
8	2.56993	3.043289	0.84	0.398	-3.394808	8.534667
9	14.0863	3.061781	4.60	0.000	8.085324	20.08728
10	13.95124	2.871899	4.86	0.000	8.322416	19.58005
11	1.463061	3.241507	0.45	0.652	-4.890176	7.816298
12	10.07987	3.090417	3.26	0.001	4.022761	16.13697
13	3.000474	3.021494	0.99	0.321	-2.921546	8.922494
14	4.883631	3.053135	1.60	0.110	-1.100404	10.86767
15	11.78584	3.063791	3.85	0.000	5.780925	17.79076
16	3.716296	3.112943	1.19	0.233	-2.384959	9.817551
17	.1667955	3.036803	0.05	0.956	-5.78523	6.118821
18	5.316265	3.138264	1.69	0.090	-.8346185	11.46715
19	3.540203	3.190981	1.11	0.267	-2.714006	9.794412
20	-1.083063	3.359275	-0.32	0.747	-7.667121	5.500994
21	6.15431	3.197178	1.92	0.054	-.1120434	12.42066
22	3.45268	3.080753	1.12	0.262	-2.585485	9.490845
23	5.9007	2.855009	2.07	0.039	.3049841	11.49642
24	.2838195	3.227078	0.09	0.930	-6.041138	6.608777
25	1.623859	3.143412	0.52	0.605	-4.537115	7.784833
26	3.276753	3.315266	0.99	0.323	-3.22105	9.774556
27	4.096423	3.3584	1.22	0.223	-2.48592	10.67877
28	5.135219	2.944553	1.74	0.081	-.636	10.90644
29	2.019904	3.202628	0.63	0.528	-4.257132	8.29694
30	2.579952	3.069177	0.84	0.401	-3.435525	8.595429
32	-7.168931	3.871261	-1.85	0.064	-14.75646	.4186001
33	3.292807	2.858291	1.15	0.249	-2.309341	8.894954
34	-1.594624	2.778028	-0.57	0.566	-7.039459	3.850211
35	4.915961	2.756339	1.78	0.075	-.4863652	10.31829
36	3.836801	3.168055	1.21	0.226	-2.372473	10.04608
sigma_u	0					
sigma_e	4.3502245					

Description of Exhibit 2(b)

We performed a panel data regression with random effect as suggested by our initial Hausman test. The data consists of 180 observations and 36 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a moderate significance ($P > |z|$ of 0.099) with positive coefficient for the dependent variable representing ROE. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of ROE in the firm.

**Exhibit 3 (a) – Panel Data regressions result:
Female executive ratio vs Asset Turnover (Retail Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg assetturnover femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:		Obs per group:				
within = 0.2149		min =		5		
between = 0.3256		avg =		5.0		
overall = 0.0300		max =		5		
corr(u_i, Xb) = -0.3012			F(1,23) =		6.29	
			Prob > F =		0.0196	
assetturnover	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	-.0141589	.0056435	-2.51	0.020	-.0258333	-.0024845
_cons	1.085312	.0479398	22.64	0.000	.9861412	1.184483
sigma_u .37376296						
sigma_e .08384899						
rho .95208422 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 90.34 Prob > F = 0.0000						

Description of Exhibit 3(a)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance ($P > |t|$ of 0.020) with negative coefficient for the dependent variable representing Asset Turnover Ratio in the Retail Industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of Asset Turnover Ratio in firms within the retail industry.

**Exhibit 3 (b) – Panel Data regressions result:
Female executive ratio vs Leverage (Retail Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg leverage femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:			Obs per group:			
within = 0.1615			min =		5	
between = 0.2377			avg =		5.0	
overall = 0.0162			max =		5	
corr(u_i, Xb) = -0.2644			F(1,23) =		4.43	
			Prob > F =		0.0464	
leverage	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	.0369736	.0175646	2.11	0.046	.0006385	.0733087
_cons	2.269029	.149207	15.21	0.000	1.960371	2.577687
sigma_u .92823827						
sigma_e .26096989						
rho .92674737 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 58.84 Prob > F = 0.0000						

Description of Exhibit 3(b)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance (**P**>|t| of 0.046) with positive coefficient for the dependent variable representing Leverage in the Retail Industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of Leverage in firms within the retail industry.

**Exhibit 3 (c) – Panel Data regressions result:
Female executive ratio vs Asset Turnover**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg assetturnover femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:		Obs per group:				
within = 0.1349		min =		5		
between = 0.8055		avg =		5.0		
overall = 0.1108		max =		5		
corr(u_i, Xb) = -0.5536			F(1,23) =		3.59	
			Prob > F =		0.0709	
assetturnover	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	-.0030404	.0016052	-1.89	0.071	-.006361	.0002802
_cons	.589117	.0171883	34.27	0.000	.5535603	.6246737
sigma_u .12096296						
sigma_e .05620823						
rho .8224218 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 16.06			Prob > F = 0.0000			

Description of Exhibit 3(c)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a moderate significance (**P>|t|** of 0.071) with negative coefficient for the dependent variable representing Asset Turnover in the Pharmaceutical Industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of Asset Turnover in firms within the pharmaceutical industry.

**Exhibit 3 (d) – Panel Data regressions result:
Female executive ratio vs ROE (Banking Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg roe femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs = 30			
Group variable: id			Number of groups = 6			
R-sq:		Obs per group:				
within = 0.1231		min = 5				
between = 0.3164		avg = 5.0				
overall = 0.0367		max = 5				
corr(u_i, Xb) = -0.5691			F(1,23) = 3.23			
			Prob > F = 0.0855			
roe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
femaleexecutiveratio	-.1264424	.0703704	-1.80	0.086	-.2720146	.0191298
_cons	8.615994	.5975436	14.42	0.000	7.379881	9.852108
sigma_u 1.9053651						
sigma_e 1.2447321						
rho .70088309 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 7.92			Prob > F = 0.0002			

Description of Exhibit 3(d)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a moderate significance ($P>|t|$ of 0.086) with negative coefficient for the dependent variable representing ROE in the Banking Industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of ROE in firms within the Banking industry.

**Exhibit 3 (e) – Panel Data regressions result:
Female executive ratio vs Net profit margin**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg netprofitmargin femaleexecutiveratio , fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:			Obs per group:			
within = 0.2303			min =		5	
between = 0.0654			avg =		5.0	
overall = 0.0271			max =		5	
corr(u_i, Xb) = -0.6818			F(1,23) =		6.88	
			Prob > F =		0.0152	
netprofitmargin	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	.188696	.0719321	2.62	0.015	.0398931	.3374989
_cons	.5587526	2.043011	0.27	0.787	-3.667537	4.785042
sigma_u 6.8586012						
sigma_e 2.0875385						
rho .91521465 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) =			28.89		Prob > F = 0.0000	

Description of Exhibit 3(e)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance (**P>|t|** of 0.0152) with positive coefficient for the dependent variable representing net profit margin in the Chemical industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of net profit margin in firms within the chemical industry.

**Exhibit 3 (f) – Panel Data regressions result:
Female executive ratio vs Asset turnover (Chemical Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg assetturnover femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:			Obs per group:			
within = 0.3497			min =		5	
between = 0.0610			avg =		5.0	
overall = 0.0762			max =		5	
corr(u_i, Xb) = -0.3234			F(1,23) =		12.37	
			Prob > F =		0.0018	
assetturnover	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	.0086904	.002471	3.52	0.002	.0035788	.013802
_cons	.7871754	.0701803	11.22	0.000	.6419963	.9323544
sigma_u .28800862						
sigma_e .07170991						
rho .9416252 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 72.22			Prob > F = 0.0000			

Description of Exhibit 3(f)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance (**P>|t|** of 0.002) with positive coefficient for the dependent variable representing asset turnover ratio in the Chemical industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of asset turnover ratio in firms within the chemical industry.

**Exhibit 3 (g) – Panel Data regressions result:
Female executive ratio vs Leverage (Chemical Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg assetturnover femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:			Obs per group:			
within = 0.1855			min =		5	
between = 0.0321			avg =		5.0	
overall = 0.0419			max =		5	
corr(u_i, Xb) = -0.3289			F(1,23) =		5.24	
			Prob > F =		0.0316	
leverage	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	-.0107944	.0047162	-2.29	0.032	-.0205507	-.0010381
_cons	1.877199	.1339502	14.01	0.000	1.600102	2.154296
sigma_u .40146433						
sigma_e .13686969						
rho .8958722 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 38.36 Prob > F = 0.0000						

Description of Exhibit 3(g)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance ($P>|t|$ of 0.002) with positive coefficient for the dependent variable representing asset turnover ratio in the Chemical industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of asset turnover ratio in firms within the chemical industry.

**Exhibit 3 (h) – Panel Data regressions result:
Female executive ratio vs ROA (Chemical Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg roa femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs =		30	
Group variable: id			Number of groups =		6	
R-sq:		Obs per group:				
within = 0.2561		min = 5				
between = 0.1537		avg = 5.0				
overall = 0.0251		max = 5				
corr(u_i, Xb) = -0.8759			F(1,23) =		7.92	
			Prob > F =		0.0099	
roa	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	.2116996	.0752398	2.81	0.010	.0560541	.3673451
_cons	-.8467912	2.136957	-0.40	0.696	-5.267423	3.573841
sigma_u 5.4511315						
sigma_e 2.1835321						
rho .86173299 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 7.26			Prob > F = 0.0003			

Description of Exhibit 3(h)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance ($P>|t|$ of 0.010) with positive coefficient for the dependent variable representing ROA in the Chemical industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of ROA in firms within the chemical industry.

**Exhibit 3 (i) – Panel Data regressions result:
Female executive ratio vs ROE (Chemical Industry)**

. xtset id year panel variable: id (strongly balanced) time variable: year, 2013 to 2017 delta: 1 unit						
. xtreg roe femaleexecutiveratio, fe						
Fixed-effects (within) regression			Number of obs	=	30	
Group variable: id			Number of groups	=	6	
R-sq:		Obs per group:				
within	= 0.1545	min	=	5		
between	= 0.2815	avg	=	5.0		
overall	= 0.0395	max	=	5		
corr(u_i, Xb) = -0.9013			F(1,23)	=	4.20	
			Prob > F	=	0.0519	
roa	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
femaleexecutiveratio	.2649463	.1292361	2.05	0.052	-.002399	.5322915
_cons	.1747828	3.670555	0.05	0.962	-7.41834	7.767905
sigma_u 6.9352938						
sigma_e 3.7505557						
rho .77372034 (fraction of variance due to u_i)						
F test that all u_i=0: F(5, 23) = 3.21			Prob > F = 0.0242			

Description of Exhibit 3(i)

We performed a panel data regression with fixed effects as suggested by our initial Hausman test (certain considerations were made when selecting re or fe because the Hausman test gave mixed results).

The data consists of 30 observations and 6 groups ranging from years 2013 to 2017 (5 years). This panel data regression had a strong significance (P>|t| of 0.052) with positive coefficient for the dependent variable representing ROE in the Chemical industry. In other words, the higher the female representation is at the board of directors, the more it influences the dynamics of ROE in firms within the chemical industry.

Table 2 – Summary of secondary data sample

COMPANY NAME	INDUSTRY					
	Retail	Service	Food	Pharmaceutical	Banking	Chemical
SEVEN & I HOLDINGS CO., LTD		RAKUTEN INC.	KIRIN HOLDINGS CO.,LTD	OTSUKA HOLDINGS CO.,LTD	MITSUBISHI UFJ FINANCIAL GROUP INC.	SHISEIDO CO., LTD
AEON CO., LTD	DENTSU INC.	ASAHI GROUP HOLDINGS CO.,LTD	TAKEDA PHARMACEUTICAL CO.,LTD	MIZUHO FINANCIAL GROUP INC.		C'BON COSMETICS CO.,LTD
TAKASHIMAYA COMPANY LIMITED	DENA CO., LTD	JAPAN TOBACCO INC.	DAIICHI SANKYO CO.,LTD	SUMITOMO MITSUI FINANCIAL GROUP INC.		HABA LABORATORIES, INC.
MARUI GROUP CO., LTD	YAHOO JAPAN CORP.	NICHIREI CORP.	EISAI CO.,LTD	RESONA HOLDINGS, INC.		S.T.CORPORATION
FAST RETAILING CO., LTD	KONAMI HOLDINGS CORP.	TAKARA HOLDINGS INC.	ASTELLAS PHARMA INC.	THE CHIBA BANK, LTD.		MEC COMPANY LTD.
FAMILYMART UNY HOLDINGSCO., LTD	TREND MICRO INC.	MEIJI HOLDINGS CO.,LTD	KYOWA HAKKO KIRIN CO., LTD	SHINSEI BANK, LTD.		POLA ORBIS HOLDINGS INC.
	Total companies					
	Independent Variable (Label)					
	36					
	Dependent Variable (Label)					
	Net Profit Margin (netprofitmargin)					
	Asset Turnover (assetturnover)					
	Equity Multiplier (leverage)					
	ROA (roa)					
	ROE(roe)					
	Time Period (Number of years)					
	2013 - 2017 (5)					

Table 3 – Summary of panel data regression results analyzed individually per industry

P> t					
Industry	Net Profit Margin	Asset Turnover	Leverage	ROA	ROE
Retail	0.349	0.020(-)	0.046	0.960	0.815
Service	0.121	0.167(-)	0.179(-)	0.575	0.868
Food	0.585	0.384	0.146(-)	0.514	0.669
Pharmaceutical	0.313(-)	0.071(-)	0.386	0.325	0.330
Banking	0.566	0.552(-)	0.523	0.180(-)	0.086(-)
Chemical	0.015	0.002	0.032(-)	0.010	0.052

Note: Red color indicates no significance, Orange indicates moderate significance and Green indicates a strong significance. The “(-)” symbol on the right represents a negative coefficient in the relationship.

Exhibit 12 – Business cards of all participants in surveys and interviews

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