

論 説

Capital Account Liberalization and Economic Growth: The Empirical Relationship Revisited

Kang-Kook Lee*

Abstract

This paper reexamines the effects of capital account liberalization on economic growth, using various measures and methods. We find the evidence that capital account liberalization promotes economic growth temporarily in panel regressions that use more sophisticated indexes for financial opening. We also examine the conditional effects of capital account liberalization on economic growth. There is a nonlinear relationship between its growth effects and the level of growth in cross-country regressions. The short-run growth effects of capital account liberalization in panel regressions are larger in a country that has lower government consumption.

Keywords: Capital Account Liberalization, Economic growth, Globalization

JEL Classification: F30, F43, O40

I. Introduction

The effect of capital account liberalization on economic growth is one of the most controversial issues at the center of hot debates in recent studies of economics, and yet there is no clear conclusion. Many argue that financial opening spurs economic growth because it encourages investment and the efficiency of capital allocation. The increase of availability of capital, the development of financial markets, the improvement of risk diversification and macroeconomic discipline of developing countries' governments are presented as benefits of capital account liberalization and financial globalization. More recent arguments indicate that these gains may be conditional on the level of economic growth, macroeconomic stabil-

*Professor, College of Economics Ritsumeikan University

Noji-Higashi 1-1-1, Kusatsu shi, Shiga ken, Japan

Tel: 81-77-561-5041

Fax: 81-77-561-3947

E-mail: kangkooklee@gmail.com

ity, institutions, and the development of financial markets (Prasad et al., 2003). However, many critical economists argue that international financial markets suffer from market failures due to information problems and international investors' herd behaviors. Most developing countries do not have necessary conditions to reap the benefit of financial opening, and many of them experienced financial crises after financial opening in reality. Thus, capital account liberalization may not bring about economic growth but cause more economic instability in developing countries (Stiglitz, 2000).

A large number of empirical studies have examined the effects of capital account liberalization on growth, using various methods including cross-country regressions. But results of these studies are at best mixed. There is only little evidence for the growth effects of capital account liberalization, even after taking into account of preconditions and indirect channels of financial opening (Kose et al., 2006). This is puzzling and not consistent with the common argument for collateral benefits and threshold effects of capital account liberalization. However, this is understandable, considering that cross-country regressions basically test long-term growth effects of capital account liberalization, not temporary effects. Financial opening may well exert short-term effects on economic growth but current empirical studies have limitations to test these because of problems of indexes of capital account liberalization.

This paper aims at contributing to the current debate by assessing the economic effects of capital account liberalization, using more extensive measures for capital account openness and panel regressions. Section II presents a brief review of current empirical studies about capital account liberalization and growth, and section III explains several measures of capital account openness. In section IV, we report the empirical results of both cross-country and panel regressions considering several preconditions together, and examine whether capital account liberalization exerts positive growth effects. We do find the significant short-run growth effects of financial opening though there is no evidence for long-run growth effects.

II. A Review of Current Studies

There are already many empirical studies that test the growth effects of capital account liberalization using various methods and measures. Rodrik (1998) is one of the first empirical studies to use the dummy variable for capital account openness from the IMF report. He reports that there are no growth effects of capital account liberalization, which supports the result of a preceding study (Grilli and Milesi-Ferretti, 1995). In contrast, Quinn (1997) reports the benefits of liberalization to growth using the change variable of more extensive capital account opening index constructed by himself. Edwards (2001) and Edison et al.

(2002a) also find a positive correlation between capital account liberalization and economic growth, using various measures of capital account openness including the Quinn index. However, the evidence for the gain of capital account liberalization is weak. Edison et al. (2002b) conduct a detailed study about the relationship between international financial integration and growth, using several indexes including real capital flows and methods including dynamic panel estimations. They report that there is no evidence that financial integration and economic growth are related positively. The difference in results of various studies may be due to the difference in samples, periods, and most of all, the index itself (Eichengreen et al., 2001).

Empirical studies also examine several preconditions and channels of the growth effect of financial opening, only to report mixed results. Edwards (2001) finds that the growth effects are larger when the level of growth is higher but its robustness is refuted by Arteta et al. (2001). Kraay (1998) finds no evidence for the contingent effect after investigating the role of institutional and financial development, macroeconomic stability, and the black market premium. None of these presumed prerequisites are important in Edison et al. (2002b) either. Chanda (2005) and Lee and Jayadev (2005) report that social homogeneity is a precondition for capital controls, not liberalization, to spur growth. Regarding channels, Klein and Olivei (2001) argue that liberalization has a positive impact on financial development, and thereby encouraging growth, of which the result is supported in part by Chinn and Ito (2006). Bekaert et al. (2005) and Henry (2003) finds that financial opening promotes investment and its efficiency using measures of equity market opening. Meanwhile, Klein (2003) and Edison et al. (2004) reports a nonlinear relationship between the growth effect of financial opening and the level of growth or government quality.

Other empirical studies by the IMF researchers using a de facto financial globalization index find insignificant results too. Prasad et al. (2003) obtain the result that there is no relationship between financial integration measured by foreign capital flows and economic growth. Kose et al. (2006) find that stocks of foreign assets and liabilities are not significant to economic growth although they still underscore collateral benefits and thresholds. Finally, Prasad et al. (2006), using the same measure, report that the growth performance of developing countries with more foreign capital inflows is worse. In sum, current cross-country empirical studies find at best mixed results of the growth effects of capital account liberalization.

The mixed results of current empirical studies have indeed puzzled many economists. However, it should be noted that most studies have examined long-term growth effects, using cross-country regressions, and there is little reason in theory that capital account liberalization promotes economic growth permanently. The standard neoclassical economic growth theory predicts that the steady state equilibrium in the economy is at the point where the per worker capital stock growth rate is zero. If we assume the simple Solow

growth model with labor-augmenting technology, where $Y = F(K, AL)$, then the equilibrium condition is, $s f(k^*(t)) = (n + g + d)k^*(t)$ ¹⁾. When the economy introduces capital account liberalization, and this decreases cost of capital and increases foreign investment, it will bring about a new steady state equilibrium with a jump of per worker capital stock, changing the original equilibrium k^* to another.

In this model, it is important to keep in mind that there is no change in the growth rate of capital stock per worker and output per worker after the transition to a new equilibrium is over as Henry (2006) illustrates this graphically.²⁾ We can only observe the increase of growth rates of capital and output per worker in the transition process because per worker capital stock grows faster than before or after transition due to a jump to a new steady state. This transition dynamics in the neoclassical growth model suggests that that financial opening could promote economic growth within a given country but growth effects are only temporary and rather short-run.

If there are only short-term growth effects of capital account liberalization, we may well understand why cross-country empirical studies have failed to report the strong evidence for growth effects of capital account liberalization. Studies using cross-country regressions compare many countries' long-run growth rates over than 20 years by assuming that financial opening spurs economic growth permanently. They use the index such as average years of financial opening out of whole years or the average of the level of capital account openness for the long period for each country, and regress growth rates on these indicators. This line of study naturally cannot examine the temporary effects of capital account liberalization on economic growth.

Another approach is called on in examining the short-term growth effects (Henry, 2006). Several studies to analyze so-called policy experiments support these temporary growth effects of capital account liberalization. They report that financial opening, especially stock market opening, encourages economic growth by increasing investment and its efficiency, related with the decrease of the cost of capital, using before and after approach to analyze the specific policy impacts on a given country (Bekaert et al., 2005). Of course the best approach to utilize cross-country differences would be panel regressions that could highlight the temporary growth effects of policy. However there is almost no study to use the method of cross-country panel regressions mainly owing to the limitation of the index of capital account openness. We use more sophisticated policy indexes for capital account openness and carry out panel regressions in an attempt to demonstrate these effects in the following section.

III. Measuring Capital Account Liberalization

One must establish a good measure of capital account openness in order to investigate economic effects of capital account liberalization. The most widely used index is a dummy variable from the IMF annual report, "Exchange Arrangements and Exchange Restrictions" (Rodrik, 1998; Klein and Olivei, 2001; Chanda, 2005). However, this cannot capture the intensity of controls. To overcome this problem, Quinn (1997) constructed comprehensive cross-country indicators of capital account openness, from 0 to 4 with 8 degrees, after reading the text of the IMF report. There are other attempts but the Quinn index is still one of the most reliant and popular indicators (Edwards, 2001; Edison et al., 2002b). However, it covers only 70 countries and limited time periods, all years for OECD countries and 1973, 1982, and 1988 for developing countries.

Lee and Jayadev (2005) extend the coverage of periods and countries in making a continuous index after reading the text of the IMF reports, following Quinn's original method. The index is established for more than 100 countries and all years from 1973 to 1995 reflecting the significant changes of the criteria of capital account openness in the reports after 1996. Recently, Chinn and Ito (2006) make another attempt to make use of extensive information from the IMF report. They do not only use the information of capital account restriction but calculate the principal component of capital account restriction, current account restriction, foreign exchange restriction, and the surrender of export proceeds variables from the IMF report. This index covers the longest periods and many countries though it is indicative of financial opening only in a broader sense because capital account openness is just a partial component in this index.³⁾

Some authors take a different approach to pick up the year of equity market opening after investigating changes in policy (Baekaert and Harvey, 2000; Henry, 2003). But they have the same problem of the simple dummy variable. An alternative approach is to use a de facto financial opening variable, that is capital flows or stocks of foreign assets and liabilities in reality as a percentage of GDP (Kose et al., 2006). Recent studies have begun to use this due to limitations of de jure measures. But it is problematic that de facto measures may not be strongly associated with capital account policy. Exogenous factors and growth in itself may influence this measure for financial globalization, and hence econometric studies using this may have endogeneity problem that is difficult to solve.⁴⁾

In this study, we use policy-oriented measures for capital account openness in an attempt to highlight liberalization effects. First, we use an extensive capital account openness index⁵⁾ constructed by Lee and Jayadev (2005) and Chinn and Ito (2006) as well as Quinn index. Quinn originally used the 'change' of his index as a measure for liberalization but

the change variable does not measure how long and from exactly when the capital account has been open (Eichengreen, 2001). Thus, we simply use a 'level' index following most of other studies.

We employ two other measures of capital account openness from the IMF for our examination. We make use of the dummy variable from new capital account liberalization data provided by Mody and Murshid (2002) that updates country information after 1990.⁶⁾ Not only the index for capital account restriction, but also a composite index to include current account restriction and foreign exchange restriction altogether is used simultaneously. For integrity, we compare the results of estimations using various indexes such as the Lee and Jayadev index, the Chinn and Ito index, Quinn index and the IMF indexes. In panel regressions we use the Lee and Jayadev index and the Chinn and Ito index because of the limitation of the dummy variable.

With regard to other variables, standard macroeconomic variables in cross-country growth regressions are used. The growth rate of GDP per capita, education, inflation, government consumption, and trade openness are obtained from the World Development Indicators (WDI).

IV. Empirical Results: Does Capital Account Liberalization Promote Growth ?

1. Long-Run Growth Effects in Cross-Country Regressions and Preconditions

We first examine the growth effects of capital account liberalization with cross-country regressions, using various measures for liberalization and the simple OLS method. The specification of the baseline model where we regress economic growth on indexes of capital account liberalization controlling for other determinants of growth is as followings.

$$y_i = b_1 + b_2 X_i + b_3 CAL_i + e_i$$

y : the growth rate of real GDP per capita, X : control variables, CAL : capital account liberalization

The control variables include the log of initial real GDP per capita, initial educational attainment measured by the log of the secondary school enrollment ratio, and regional dummy variables, very similar to the parsimonious specification of Rodrik (1998).⁷⁾ Table 1 reports that there is no evidence for the positive effects of capital account liberalization on economic growth from 1973 to 1995. No measures for capital account liberalization including the Lee and Jayadev index, the IMF capital account openness dummy, the IMF financial integration reflecting capital account openness, current account openness and exchange rates controls, and the Quinn index are significant in the third row of column 1-4. The

Table 1. Capital account liberalization and economic growth

Dependent variable: average real GDP per capita growth rate (1973-1995)

Independent Variables	Lee and Jayadev index	IMF capital account openness dummy	IMF financial integration	Quinn index	Chinn and Ito index (1973-2005)	Lee and Jayadev index (1986-1995)
InitGDP	-0.737*** (-3.37)	-0.522** (-2.58)	-0.574** (-2.46)	-0.641** (-2.55)	-1.427*** (-3.455)	-0.616** (-2.00)
InitEDU	0.639** (2.22)	0.524* (1.84)	0.559* (1.90)	0.585 (1.15)	2.099*** (3.67)	1.00** (2.00)
CAL	0.348 (1.12)	-0.102 (-0.16)	0.053 (0.22)	0.410 (1.59)	0.129 (0.331)	0.563 (1.54)
EAP	1.352** (2.30)	1.475** (2.44)	1.396** (2.19)	1.542*** (3.01)	1.966** (1.88)	2.62*** (3.59)
LAC	-1.409** (-2.89)	-1.402*** (-2.845)	-1.396*** (-2.82)	-1.468*** (-3.182)	-2.372*** (-2.796)	-0.669 (-1.06)
SSA	-2.341*** (-3.80)	-2.342*** (-3.769)	-2.344*** (-3.77)	-3.212*** (-2.97)	-3.350*** (-2.99)	-1.60** (-2.02)
R-square	0.377	0.369	0.369	0.497	0.418	0.322
No. of Obs.	101	101	101	58	101	112

Note:

- 1) InitGDP: the log of real GDP per capita in 1973.
- 2) InitEDU: the log of the secondary level education enrollment ratio of all population in 1975, all from World Development Indicator
- 3) CAL: capital account liberalization using various measures
- 4) Quinn index: 1973, 1982 and 1988 for all countries, all years for OECD countries.
- 5) EAP: East Asia and Pacific, LAAM: Latin America and Caribbean, SSA: Sub-Saharan Africa
- 6) Intercept not reported
- 7) t-value in parenthesis, ***: significant at 1% level, **: at 5% level, *: at 10% level.
- 8) Same in following tables

Quinn index appears to be the best in terms of growth effects among these measures for capital account liberalization as other studies report, but it is still not statistically significant. Including the institutional development index following Rodrik (1998) and other common control variables such as inflation does not change the result.

Though not reported, when we include the investment share in the control variables set, the coefficients of the Lee and Jayadev index and the Quinn index become significant at the 95% and the 90% confidence level respectively. This result is not highly robust to inclusion of other control variables such as inflation. But this explains why there are different results in current studies depending on specifications and several studies report the significant result using the Quinn index after controlling for the investment share. Once we control for investment, the growth effects of capital account liberalization is likely to become larger. It is because capital account liberalization does not encourage investment and if there is any growth effect of financial opening it is not through the investment channel.

The model in column 5 extends the coverage of the period as long as more than 30 years using the Chinn and Ito index although this index may not be exactly about capital account opening policy. We have the same result that capital account liberalization does not spur economic growth in the long run. The last column reports that the coefficient of the capital account openness index changes little bit more significant in the estimation to

deal with the 1986–1995 period, but still less than the 90% confidence level and much lower with more control variables. The test of the more recent period after the 1990s using the Chinn and Ito index produces the same result. This implicates that there is no correlation between financial opening and growth in the more recent period when financial globalization proceeded more. Our results demonstrate that there is no evidence for the long-run growth effects of capital account liberalization

Next, we investigate whether the growth effects of capital account liberalization depend on preconditions. Desirable prerequisites that are expected to help financial opening to promote growth more include the level of growth, financial development, institutional quality, macroeconomic balance and trade liberalization (Kose et al., 2006; Edwards, 2001; Arteta et al., 2001). We add the interaction term of capital account liberalization and condition variable, and also add the condition variable independently in our original specification as followings to examine this.

$$y_i = b_1 + b_2 X_i + b_3 CAL_i + b_4 Condition_i + b_5 CAL_i * Condition_i + e_i$$

Condition_i: precondition variables including initial GDP per capita and others.

We first test the level of growth as a precondition for financial opening to spur economic growth more. It is surprising that the interaction terms of the initial level of GDP per capita are negatively significant in almost all regressions except one using the Quinn index as Table 2 shows. This result is robust to inclusion of more control variables such as institutions, inflation and government consumption. It suggests that the benefit of capital account liberalization is smaller in more developed countries contrary to the common argument (Edwards, 2001). However, this conforms to the result of McKenzie (2001) that the interaction terms of current account controls and initial GDP per capita are positive.¹¹⁾

Klein (2003) recently argues that the relationship between the growth effects of capital account liberalization and the level of growth may not be linear. Only middle income countries could have benefits from financial opening if there is an inverted U relationship between these two variables. We test this hypothesis by adding the quadratic term of initial GDP per capita interacted with capital account liberalization. We find a similar result to that of Klein (2003) and Edison et al. (2004) as Table 2 reports although its significance depends on the model.¹²⁾ It suggests that liberalization may do harm such as capital flight and instability to very poor countries, while it may provide no benefits for already developed ones due to decreasing marginal benefits of openness, resulting in a nonlinear growth effect of financial opening.

Similar to the level of growth, the interaction term of capital account liberalization and institutional development measured by the GADP (government anti-diversion policy) index is generally negative and statistically significant in the longer-term regression using the

Table 2. Capital account liberalization, growth and preconditions

Dependent variable: average real GDP per capita growth rate (1973-1995)

Condition Variables	Lee and Jayadev index	IMF capital account openness dummy	Quinn index	Chinn and Ito index (1973-2005)
Initial GDP				
InitGDP	-0.064 (-0.17)	-0.268 (-1.19)	-0.353 (-0.72)	-1.305*** (-3.16)
CAL	3.23** (2.31)	7.43** (2.29)	1.502 (0.93)	3.071* (1.78)
InitGDP*CAL	-0.355** (-2.21)	-0.898** (-2.36)	-0.135 (-0.68)	-0.36* (-1.77)
R-square	0.408	0.404	0.502	0.436
No. of Obs.	101	101	58	101
Institutional Development				
GADP	1.099*** (4.65)	0.937*** (6.12)	1.004*** (3.23)	1.586*** (6.668)
CAL	1.102* (1.77)	2.544 (1.55)	1.350* (2.01)	1.828** (2.05)
GADP*CAL	-0.126 (-1.44)	-0.327 (-1.46)	-0.165 (-1.63)	-0.263** (-2.10)
R-square	0.567	0.563	0.597	0.612
No. of Obs.	100	100	58	99

Note:

- 1) Basic control variables in Table 1 included
- 2) Other variables not reported

Chinn and Ito index in Table 2.¹³⁾ This casts serious doubt on the assertion that countries should develop institutions in order to benefit from liberalization, however our result is consistent with findings of other studies (Kraay, 1998; Edison et al., 2002b). It may be because good institutions do not necessarily help open capital markets encourage growth when financial markets are inherently imperfect. Also, in reality, capital account liberalization encourages growth more in countries where there is a large amount of corruption because capital controls work so poorly that they hamper economic growth in those countries. Chanda (2005) and Lee and Jayadev (2005) find that capital controls promote economic growth in countries with high homogeneity, that is a good condition for successful state intervention, represented by East Asian countries.

The growth effects of capital account liberalization are not contingent on other frequently-mentioned preconditions. When we regress economic growth on the interaction term of

financial opening and proxies of financial depth including the share of liquid liability to GDP or stock market development, neither of the interaction term is significant. When we test trade liberalization and macroeconomic imbalance as preconditions using trade share and tariffs, and black market premium as preconditions, we fail to find a significant result in all regressions. Moreover, macroeconomic stability such as inflation and government consumption is not an important condition either. All in all, our findings refute the common arguments that capital account liberalization spurs economic growth more in countries that have desirable preconditions in place.

2. Capital Account Liberalization and Short-Run Growth: Panel Regressions

Cross-country regressions cannot capture the time-varying effects of independent variables and cannot shed light on the short-term effects of capital account liberalization. But in reality, the benefits of financial opening could be felt within countries much stronger than in the long-term comparison across countries. Henry (2006) presents its theoretical basis and emphasizes that most cross-country empirical studies fail to show temporary effects. Panel regression would be much more desirable in testing the short-term growth effects within countries. However, limitation of measures for capital account openness such as simple dummy variables has prevented researchers from doing panel regressions using *de jure* index for financial globalization.

We attempt to fill this gap by employing panel regressions and extensive capital account openness measures in this section. In our panel regressions with 5-year averages of all variables, the Lee and Jayadev index is used for the period from 1976 to 1995 and the Chinn and Ito index is used for the longer period from 1976 to 2004 to run regressions.¹⁴⁾ We use the fixed effects model with country and period dummy variables. The results of the Hausmann test indicates that the fixed effects model is superior to the random effects model. Depending on data availability we include initial GDP per capita, initial secondary education and several other variables such as inflation and government consumption as control variables.¹⁵⁾

Table 3 reports the results of regressions using the Lee and Jayadev index based on the 5-year averaged unbalanced panel data. It is very interesting that the coefficients of capital account liberalization are statistically significant with a positive sign in almost all specifications. This result is robust to inclusion of other control variables. Even in the last column where initial GDP per capita, initial education, investment, trade openness, and other macroeconomic variables are included altogether in specification, the coefficient of capital account liberalization is still statistically significant. When we use random-effects model, the result does not change. Besides, we have similar results using 3-year and 7-year average data, though the result becomes insignificant using 10-year average data. This implicates that the growth effects are rather short-run and they become ambiguous in the longer run

Table 3. Capital account liberalization and economic growth in panel regression (using Lee and Jayadev index)

Dependent variable: 5-year average real GDP per capita growth rate (1976-1995)

Independent Variables						
InitGDP	-6.109*** (-6.70)	-6.955*** (-8.01)	-6.151*** (-6.63)	-5.749*** (-6.38)	-6.629*** (-7.36)	-7.415*** (-8.14)
InitEDU	-0.261 (-0.41)	-0.091 (-0.16)	-2.233*** (-3.04)	-0.419 (-0.668)	-0.016 (-0.03)	-2.248*** (-3.09)
Lee and Jayadev index	1.095** (2.52)	1.000** (2.44)	0.710* (1.70)	1.000** (2.33)	1.09** (2.56)	0.684* (1.73)
Invest		0.223*** (6.38)				0.175*** (4.60)
Inflation			-0.021*** (-4.59)			-0.022*** (-4.925)
Govcons				-0.164*** (-3.46)		-0.041 (-0.73)
Trade Open					0.05*** (4.17)	0.028* (1.92)
R-square	0.591	0.641	0.656	0.608	0.615	0.700
No. of Obs.	439	436	390	435	432	382

Note:

- 1) All variables are 5-year non-overlapping averages over the period.
- 2) Invest: domestic capital formation over GDP
- 3) Inflation: the CPI (consumer price index) growth rate
- 5) Govcons: government consumption over GDP
- 6) Trade Open: (export + import) / GDP
- 8) Intercept not reported
- 9) Same in following tables

Table 4. Capital account liberalization and economic growth in panel regression (using Chinn and Ito index)

Dependent variable: 5-year average real GDP per capita growth rate (1976-2005)

Independent Variables						
InitGDP	-4.843*** (-8.37)	-5.2335*** (-9.383)	-5.139*** (-8.59)	-4.395*** (-7.68)	-5.219*** (-8.87)	-5.343*** (-9.07)
InitEDU	-0.634 (-1.41)	-0.440 (-1.00)	-1.853*** (-3.50)	-0.568 (-1.267)	-0.439 (-0.96)	-1.628*** (-3.18)
Chinn and Ito index	0.360** (2.50)	0.278** (2.00)	0.197 (1.39)	0.289** (2.03)	0.357** (2.49)	0.110 (0.42)
Invest		0.175*** (7.19)				0.151*** (5.70)
Inflation			-0.020*** (-5.31)			-0.017*** (-4.54)
Govcons				-0.122*** (-3.64)		-0.093*** (-2.50)
Trade Open					0.05*** (4.17)	0.010 (1.20)
R-square	0.592	0.633	0.637	0.610	0.604	0.679
No. of Obs.	684	674	609	666	674	588

Table 5. Capital account liberalization, economic growth and government consumption in panel regression

Dependent variable: 5-year average real GDP per capita growth rate

Independent variables	1976-1995	Independent variables	1976-2005
Govcons	-0.045 (-0.495)	Govcons	-0.157*** (-4.30)
Lee and Jayadev	2.070** (2.54)	Chinn and Ito	1.052*** (2.980)
Govcons* Lee and Jayadev	-0.068 (-1.54)	Govcons* Chinn and Ito	-0.050** (-2.36)
R-square	0.611	R-square	0.614
No. of Obs.	435	No. of Obs.	666

Note:

1) Other variables including intercept, initGDP, and initEDU not reported.

as we see in the results of cross-country regressions. Table 4 reports the results of the same specification using the Chinn and Ito index for the longer period. We find that the coefficients of financial opening are significant in almost all regressions too. The coefficient becomes insignificant in the model of the last column including all control variables together, but it is still significant at the 90% confidence level in the model that drops only inflation. The results in Table 3 and Table 4 present the empirical evidence for short run growth effects of capital account liberalization.

We also investigate potential preconditions for capital account liberalization to spur growth, adding interaction terms in panel regressions. Various macroeconomic variables including the level of growth, inflation, government consumption, and trade openness are tested. In our test, no interaction terms of financial opening and precondition variables enter significantly in regression models, though the result is not reported.¹⁶⁾ Hence, the argument that liberalization can be successful, leading to higher growth, under most of these preconditions has no empirical ground even in short run within a given country. Only when we use government consumption as a precondition variable, the interaction term is significantly negative when we use the Chinn and Ito index in Table 5. Even after controlling for other variables, this result still holds. It is not significant in the model using the Lee and Jayadev index but its significance is fairly high.

This suggests that capital account liberalization could accelerate short-run growth more when a country has lower government consumption compared with GDP. It is likely that when governments are not fiscally disciplined, the cost of capital account liberalization could be higher because it could increase the possibility of financial turmoil after financial opening.

Of course, we may well be careful in the interpretation of the result of the panel regressions. It is difficult to control other variables in the fixed effects model owing to the data availability and Rodriguez and Rodrik (1999) indicates the commonly used 5-year average

panel is not free from problems concerning the effect of lags and business cycles. Having said this limit, our findings suggest that capital account liberalization can encourage economic growth within a given country temporarily, particularly in a country with lower government consumption. This finding is consistent with other studies that report the positive impact of financial opening in a given country using the before and after method (Bekaert et al, 2005; Henry, 2000, 2003).

However, there is still a question about how sustainable these short-run growth effects could be. Capital account liberalization may boost rapid foreign capital inflows, investment and hence economic growth temporarily but this is frequently associated with irrational exuberance and overborrowing. In this case, long-run economic growth will not be encouraged because the end result could be higher financial instability as we see in financial crises in many countries. This poses a crucial question about how developing countries maintain this short-run benefit of financial opening in order to promote longer-run economic growth stably.

V. Conclusions

Economists and policy makers believe that capital account liberalization promotes economic growth by increasing investment and encouraging economic efficiency, at least under desirable circumstances. However, many countries that have liberalized capital accounts have not been rewarded with higher growth but have undergone more instability frequently. Current empirical studies have not found the strong evidence that capital account liberalization spurs growth, which calls on the development of more sophisticated empirical research.

We have attempted to study extensively whether capital account liberalization leads to higher economic growth, using various measures and methods in this paper. Considering the limitation of current studies that are not able to properly demonstrate short-run growth effects of capital account liberalization, predicted by the neoclassical growth theory, this study has made an effort to examine not only the long-run effects but also the temporary effects of financial opening on growth. More sophisticated indexes of capital account openness and the panel regressions are employed for this purpose.

We find that there is no empirical evidence that capital account liberalization spurs long-run economic growth in cross-country regressions. However, capital account liberalization and growth are associated positively in panel regressions, which demonstrates the temporary positive effects of financial opening on economic growth within a country. We also find that the temporary growth effects are larger in countries with less government consumption in panel regressions and there is a nonlinear relationship between the growth ef-

fects and the level of growth across countries in cross-country regressions. This paper contributes to the development of current empirical debates about capital account liberalization and growth by finding the first evidence of significant short-run growth effects of financial opening.

Notes

- 1) Y is output, K is capital stock, L is labor, and A is knowledge or effectiveness of labor. Also, s is the fraction of output devoted to investment, g and n are growth rates of knowledge and population, and d is the depreciation rate, and k is capital stock per unit of effective labor, calculated by $k=K/AL$. Besides, in this model, it is assumed that countries are near the steady state equilibria originally, which might be not very realistic.
- 2) See Figure 2 in Henry (2006) for graphical illustration.
- 3) It should be noted that these de jure indexes are not perfect in reality. First, they may not capture the intensity of 'enforcement' of capital account restrictions and the possibility of evasion of regulation in reality. Also, the index based on formal regulations may not be a good gauge of informal measures that may work as capital controls.
- 4) Mody and Murshid (2002) report that there are many factors to influence capital inflows.
- 5) We thank Professor Quinn for providing his dataset. There is only a slight difference between the Quinn and the Lee and Jayadev index. The correlation between this index and the Quinn index is as high as 0.90 and that between this index and the IMF dummy is 0.69 (Lee and Jayadev, 2005).
- 6) We thank Dr. Murshid for providing the dataset. The information of the original reports is not totally same to that in this updated dataset. However, using the dummy variable from the original reports does not affect the result.
- 7) Rodrik (1998) includes quality of governmental institutions as another control variable. But inclusion of this could be problematic because of endogeneity. We exclude Liberia from our sample because it is an outlier with about minus 12 percent growth and full capital account liberalization. Inclusion of Liberia does not affect the result.
- 8) The result will be provided by authors on request.
- 9) Interestingly, some studies include the investment share in their setup while others do not include it. For example, Quinn (1997), Edwards (2001) and Edison et al. (2002a) include the investment share, whereas Rodrik (1998), Kraay (1998), Chanda (2005), Edison et al. (2002b), and Kose et al. (2006) do not include the investment share. Studies including the investment share tend to report more significant results in general.
- 10) When we test the model for the investment share the coefficients of capital account liberalization are generally negative though it is not significant. Mody and Murshid (2002) also report the coefficient of financial integration is negative in the investment regression though it is not always statistically significant. Kraay (1998) and Rodrik (1998) reports the negative signs of the coefficients of financial opening in the regression for the investment share. This may reflect the fact that long-run investment could be hampered by instability that financial opening frequently causes.
- 11) He interprets this as an evidence for economic opening to promote convergence of growth rates across countries in line with the convergence debate.
- 12) The specification is $y_i = b_1 + b_2 X_i + b_3 CAL_i + b_4 CAL_i * Y_i + b_5 CAL_i * Y_i^2 + e_i$. For the hypothesis

to be true, b_4 should be significantly positive, while b_5 should be significantly negative. See Klein (2003).

- 13) There is no inverted U-shaped relationship between the growth effects of capital account liberalization and institutional development.
- 14) More recently, the so-called dynamic panel approach using GMM (generalized method of moment) became popular in panel estimations for economic growth, and some apply this using de facto measures (Edison et al., 2002b). Because of data structures, we just use the fixed effects model.
- 15) It should be noted that measures for institutional development such as the GADP (government anti-diversion policy) index start only from the mid-1980s (Hall and Jones, 1999). Thus, we do not include this variable in the model
- 16) In the model using the Chinn and Ito index, we also test the GADP index that we construct from the information from ICRG (International Country Risk Guide) following Hall and Jones (1999) as a precondition variable. We do not have significant result for the conditional growth effects depending on institutional development. All the results will be provided by authors on request.

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