Does Capital Account Liberalization Spur Economic Growth, or Do Controls?: Focusing on Conditions and Channels

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Abstract

This paper examines the economic effects of capital account liberalization on growth. We develop new measures for capital account openness to overcome some limitations of current measures and assess the common arguments about the relationship between growth and liberalization, focusing on channels and preconditions commonly examined. We find no evidence that capital account liberalization encourages long-term growth in cross-country regressions. On the contrary, capital controls do have a positive effect on growth, especially in countries with more institutional development, more ethnic homogeneity and a higher corporate debt ratio. Panel data estimations report ambiguous results.

Keywords: Capital Account Liberalization, Economic Growth, Financial Globalization
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I. Introduction

Capital account liberalization has been one of the most important economic policies recommended to developing countries for economic growth. Mainstream economists and international organizations have argued that financial opening can spur economic growth by increasing investment and economic efficiency. Neoclassical arguments emphasize gains from liberalization and international capital mobility (Fisher, 1998; Cooper, 1999; Dooley, 1996). According to these theories, financial market opening increases investment and helps enhance the efficiency of resource allocation by improving risk diversification and the fiscal discipline of the government (Guitan, 1997; Dornbush, 1998). However, even from a theoretical standpoint, these benefits are not always achieved since the financial market suffers from market failures. An alternative position focuses on the instability arising from free capital flows (Kim and Wei, 1999; Mckinnon and Pill, 1999; Eichengreen et al., 1997), and it is at least partly substantiated by the historical experience of financial crises associated with liberalization. More nuanced views point to the importance of several preconditions for capital account liberalization to be successful, such as macroeconomic stability, better institutions, a sound financial sector and so on (Mckinnon, 1991; Eichengreen and Mussa, 1998).

Heterodox economists are more concerned with the broad context of macroeconomic management and the development of the national economy (Crotty, 1989). According to them, with an open financial market, it is difficult for national governments to adopt an expansionary macroeconomic policy for full-employment and egalitarian policies. (Crotty and Epstein, 1996). They underscore the experience of successful capital controls and point to the case of East Asia which pursued a successful policy of capital controls under a broader national development strategy of developmental states (Crotty and Lee, 2001; Wade, 1999).

It is only recently that economists have made empirical efforts to examine the economic effect of capital account liberalization on economic performance. A large number of studies have been undertaken, but have shown only mixed results (Eichengreen, 2001; Prasad et al., 2003). These studies have two important limitations. First, there is the question of the adequacy of indices of openness. Second, there is the lack of attention given to the potential positive effects of capital controls in spurring growth. Almost all studies have focused on the condition for success of liberalization but do not consider the other possibility that controls may be helpful under specific conditions. In this paper, we introduce a better measure for capital account openness with a larger sample size, and extensively assess the arguments for preconditions and channels. We take a standard empirical method to thoroughly examine the mainstream argument using cross-country macroeconomic data

Section II presents a brief review of the most important empirical studies of this issue, and section III presents our new index of capital account openness. In section IV, we study whether liberalization spurs economic growth by employing cross-country growth regressions. We also investigate several channels through which and preconditions under which the policy might work, using several indices. In section V, we turn to conditions associated with developmental states, under which capital controls may encourage economic growth. Lastly, we use a complementary panel data analysis that may show temporary effects better. In general, we do not find any evidence that

capital account liberalization spurs economic growth in the long run, under any conditions, but we do find capital controls may encourage growth in some contexts.

II. Review of current empirical studies

1. Measuring capital account liberalization

Most empirical studies of capital account openness employ a dummy variable from the annual report of the International Monetary Fund (IMF), "Exchange Arrangements and Exchange Restrictions", following Alesina, Grilli and Milesi-Ferreti (1994). This index is used by a number of influential studies such as Rodrik (1998), Kelin and Olivei (1999), Edwards (2001), O'Donnell (2001) and Chanda (2001). However this index is too general and cannot measure the intensity and change of controls well. In order to overcome this limitation, Quinn (1997) constructed comprehensive cross-country indicators of capital account opening. From a careful reading of the IMF report, he coded the degree of capital controls and constructed a continuous index from 0 to 4 with 8 different degrees. Others, including Montiel and Reinhart (1999), Brune et al., (2001) and Martin et al. (2001), have made similar efforts but Quinn's index remains the most reliable and most commonly used.

Some authors take a different approach, investigating events about financial opening based on an examination of policy changes. Baekaert and Harvey (2000) and Henry (2000a, 2000b) pick the date of financial liberalization using this technique. But their approach has the same problems associated with the simple dummy variable: questions of intensity are by and large ignored. Moreover, these studies consider equity market opening only. Other analysts simply use the real flows as a percentage of GDP as a proxy for opening (IMF, 2001; Lane and Millesi-Ferreti; 1999). However, these indices may may not be strongly associated with capital account policies, as they are affected by many exogenous factors and growth itself.[1]

2. First round: capital account liberalization leading to economic growth?

Empirical studies have examined the growth effect of liberalization using the standard cross-country growth regression. Rodrik's provocative study (Rodrik, 1998) argues that liberalization has no effect on growth. Using the IMF dummy and controlling standard variables for growth, he finds no significant effects of liberalization on growth, investment and inflation. His results support Grilli and Milesi-Ferretti's (1995) study over a similar period that finds that capital controls have no significant effect on growth.

In contrast, studies using Quinn's index seem to support the benefit of capital account liberalization. Quinn (1997) shows that capital account liberalization is significantly important to long-term growth, while overall openness including current accounts and exchange restrictions appears weak. Recently, Edwards (2001) examines the question for the 1980s, using both the IMF dummy and Quinn's index, and finds the

[1] Studies using the capital flows index do not exactly examine the effect of 'policy' as such, as Rodriguez and Rodrik (2001) argue about trade liberalization. Mody and Murshid (2002) show that capital account openness is not important with respect to determining capital inflows.

Quinn's index is significantly positive while the IMF dummy is not. The difference among studies is due to the difference in samples, periods, and most of all, the index itself.

3. Second round: considering channels and institutional conditions

In what may be termed the 'second round' of studies, new empirical studies ask how effects of liberalization on growth are contingent on several conditions. Edwards (2001) examines whether the effect depends on the level of development, using the interaction term of opening and conditioning variables, and finds that the level of growth is important for the policy to succeed in the 1980s. However, Arteta et al, (2001) reexamine this argument and find it fragile. According to them, the liberalization effect depends on the specification, index and instrumental variables, driven by a specific sub-period. They find the level of economic development and financial depth not significant, but a lower black market premium seems important for successful liberalization. Thus, they conclude that macroeconomic and trade distortions should be removed first before proceeding with capital account liberalization.[2] Their study, however, is limited in terms of measures used, and it only examines the 1980s.

Kraay (1998) attempts to investigate the relationship between the effect of liberalization, on the one hand, and institutional and financial development, macroeconomic stability, and black market premia, on the other. He finds no evidence of a positive effect, and sometimes even a negative effect on growth.[3] Chanda (2001) attends to more social and historical conditions. Assuming that capital controls are a form of state intervention, he reports that ethnic homogeneity is a precondition for capital controls to be successful using the IMF dummy.[4] These studies call on us to study how the effect of liberalization and controls in reality is dependent on institutional contexts.

Klein and Olivei (2001) focus on financial development as a channel through which liberalization may help growth. They report that liberalization has a significant positive impact on financial development, and is thus good for growth. They also find that the result is driven by the OECD countries and does not hold for most developing countries. But their result is not robust, and, using similar data for a similar period, O'Donnel (2001) finds opposing results. Bekaert et al. (2002) take a different approach, that of an event-study of equity market opening, and they reports a positive effect of liberalization on investment, and a negative effect on consumption. Like Beakaert and Harvey (2000) and Henry (2000a), they argue that financial liberalization spurs growth by promoting investment and efficiency thanks to the falling cost of equity capital, more liquidity and more financial development.[5] However, even if the promised investment does

[2] The result is sensitive to the period. And the authors conclude that if there is a reversal of capital flows, the countries with macroeconomic imbalance are hit harder by this when they have open capital accounts.
[3] His finding is indeed puzzling to mainstream economists, but it may suggest that capital controls could be helpful under some contexts.
[4] It is informative that the coefficient of the interaction term is so large that capital controls appear to be more helpful to growth in some countries. These countries are mostly East Asian ones including Korea, while fragmented countries are mostly those in Sub-Saharan Africa. See Chanda (2001, p. 36.)
[5] However, they consider equity market opening only and their measures for opening are not useful for their panel test.

materialize, this may be a temporary 'euphoric' effect and may not help long-run growth, but may rather only aggravate instability.

2.3. Third round: unsolved questions and ongoing debates

Edison et al. (2002a) reexamine the question using various measures, and they find significance on growth when using the IMF dummy, but not when using Quinn's change index. The difference between this finding and that of Rodrik (1998) and O'Donnel (2001) over a similar period is surprising and may be attributable to differences in specification, such as their using the Africa dummy only without the institutional variable, and to the different sample size. Meanwhile, Klein (2003) argues that the initial GDP or government quality is not linearly helpful to liberalization. He reports that there is an inverse U-shaped relation between the growth responsiveness and the level of growth, due to something akin to decreasing marginal returns.

Quinn et al. (2001) examine the growth effect of liberalization with a panel approach and find that capital account liberalization, measured as changes in the index is helpful to growth. They find that none of economic variables are significant as a condition, but find that democracy is a negative condition for liberalization in emerging countries.[6] Edison et al. (2002b) undertake the most extensive examination of the issue of international financial integration and growth. They use several indices, including the IMF restriction measure, Quinn's index, and the stock of capital flows and inflows, and they perform both cross-country and dynamic panel estimations using a GMM (Generalized Method of Moment) estimator. They report that there is almost no evidence that more financial integration leads to higher growth. None of the presumed preconditions including higher initial GDP, financial development and institutional quality, they report, help capital account liberalization to spur growth. A recent study from the IMF acknowledges that the majority of studies find at best mixed effects of capital account liberalization on growth. Using capital flows in reality, the authors of this study again find that "there is no association between financial integration and economic growth" (Prasad et al., 2003, p. 27) and they admit that financial integration is neither necessary nor sufficient condition for growth. Rather, they find that financial integration may do harm by increasing volatility in consumption. They still emphasize the absorptive capacity needed to take advantage of financial integration, such as good governance and less corruption, factors that are argued to help increase the foreign direct investment (FDI) inflows and thus growth. However, considering that the effect of FDI as such is also debatable, there is a good reason to be more skeptical.[7] In sum, there have been numerous efforts examining the economic effect of capital account liberalization. For the most part, they show only mixed results. These are summarized in Table 1.

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[6] His method, using long lags of the liberalization index variable, might be questionable. For example, in his panel approach, he tests institutional variables as a precondition, with just one observation for one country, which may not lead to a correct result.

[7] Most have argued that FDI is more beneficial than other types of capital inflows, under some conditions such as higher level of human capital, including Bosworth and Collins (1998) and Borensztein et al. (1998). However, a recent study by Carkovic and Levine (2001) with the GMM panel argues against this conclusion. Interestingly, microeconomic studies fail to show the positive spillover effect of FDI. See, Hanson (2001) and Aitken and Harrison (1999).

Table. 1. Important empirical studies of capital account liberalization
((o): statistically significant, (x): not significant)

Study	Country/ period	Index	Effects	Preconditions and channels
Grilil-Millesi Perreti (1995)	61/ 1966-89	IMF dummy	Growth (x)	
Quinn (1997)	64/ 1960-89	Quinn's	Growth (o)	
Rodrik (1998)	More than 90/ 1960-89	IMF dummy	Growth (x) Investment (x)	Institutions (x)
Kraay (1998)	64/ 1985-97	Both and capital flows	Growth (x) Investment (x)	Institutions (x) Financial development (x)
Chanda (2001)	82/ 1975-95	IMF dummy	Growth (x)	Higher ethnic fragmentation (o)
Edwards (2001)	59/ 80's	Both	Growth (o) TFP (o)	Higher level of growth (o)
Arteta et al. (2001)	59/ 80's	Both	Growth (x)	Lower black market premium (o)
O'Donnel (2001)	66/ 1971-94	IMF dummy, stock of foreign asset and liabilities	Growth (x)	Financial development (x)
Quinn et al. (2001)	76/ 1960-98	Quinn's	Growth (o)	Level of growth (x) Emerging market democracy (bad)
IMF (2001)	57/ 1980-99	IMF dummy, external asset	Growth (x) Investment (o) Financial development (o)	Institutions (x)
Klein and Olivei (2001)	69/ 1976-95	IMF dummy	Growth (o) Financial development (o)	Financial development (o)
Bekaert et al. (2002)	95/ 1980-97	Equity market opening date	Growth (o) Investment (o)	Financial development(x)
Edison et al. (2002a)	89/ 1976-95	Both	Growth (o)	
Edison et al.	57/ 1980-	Both, flows	Growth (x)	Level of growth

(2002b)	2000			(x) Institutions (x)
Klein (2003)	85/ 1976-95	Both		Inverse-U shaped relation of growth level
Prasad et al.(2003)	76/1982-97	Capital flows	Growth (x) Volatility of consumption (o)	

III. Data: measures for capital account liberalization and others

First, in this section, we develop a better measure for capital account liberalization for empirical studies, focusing on the policy variable because of problems related to real capital flows variables. So far, most studies have used the IMF dummy index which has fundamental flaw, the inability to measure intensity. In this study we overcome the limit of the simple index in several ways. First, we use new capital account liberalization data from the IMF, provided by Mody and Murshid (2002) that updates country information after 1990.[8] It is a composite index of capital account restrictions, current account restrictions and restrictions on the exchange rate. We do not only use the capital account liberalization index as most studies have done, but we also use a composite index of these three restrictions simultaneously.

Second, we construct our own extensive capital account liberalization index based on Quinn's original study. Quinn has made an extensive 0-4 index for capital account openness and made the overall openness account incorporating other restrictions to establish a 0-14 index, as well. However, the index is for 70 countries and covers only a limited period, with all years for OECD countries and 1973, 1982, and 1988 for developing countries. We construct a continuous capital account openness index with a value from 0 to 4 with 8 different scales, extending the coverage of countries to more than 100 and incorporating more information from a reading of the IMF reports. Because criteria of capital account openness in the original IMF reports changed significantly after 1996, we cover the period from 1976 to 1995 for consistency. We present our coding rule in appendix I.[9]

Originally Quinn used the 'change' of his index as a measure for liberalization and some have followed this practice (Quinn, 1997; Edwards, 2001). However, the change variable does not measure how open the capital account has been. We use a 'level'

[8] There is a little discrepancy between this data and that from the original IMF reports. We basically use this updated IMF internal data in estimations. When we use the index derived from the original IMF reports, there is no difference in results. I thank Dr. Murshid for providing the dataset.

[9] I thank Professor Quinn for providing his dataset. Brune et al. (2001) differentiate each type of capital control such as foreign direct investment, portfolio investment and foreign borrowing based on new criteria from the IMF reports after 1996. However, this data is not publicly available as of yet. See Appendix II.

index rather than the change index.[10] For the integrity and consistency of the result, we use as many as five various indexes including the IMF capital account openness, IMF overall account openness, Quinn's capital account, Quinn's overall account and our extensive index, and compare the result. We then compare the results. The correlation of these indices is shown in Table 2.

Although our index is more developed than others in many respects, we also recognize some limitations. First of all, it may not capture the intensity of 'enforcement' of capital account restrictions and the possibility of evasion of regulation in reality. For instance, even under the same formal rules for capital controls, effective controls should vary across countries in reality, depending on how effectively governments enforce them. Controls must be stronger in countries with the strong governmental capacity, such as those in East Asia, rather than countries with a weaker government as in Africa. More importantly, the index based on the formal regulations may not be a good gauge of informal measures undertaken to serve as controls. For example, Epstein et al. (2003) report that, in spite of seemingly free capital accounts, the government in Singapore has discouraged internationalization of Singapore's currency because of concern about instability.[11]

Standard macroeconomic variables used in this study including the GDP growth rate, inflation, and the investment share are obtained from the World Development Indicators (WDI) of the World Bank. Other institutional variables are used to examine institutional structure: financial structures, government antidiversion index (GADP) index, corruption, ethnic fragmentation and income and land distribution, and the Weberian state index. The appendix II provides an extensive explanation about our variables and data.

IV. Does capital account liberalization spur growth?

1. Growth effect and channels with various measures

(1) Capital account liberalization and economic growth

First, we examine the effect of capital account liberalization on economic growth, investment, and the efficiency of investment, using a simple cross-country regression. In the estimation, we use five capital account liberalization indices including two IMF indices, two of Quinn's indices and finally ours for comparison. The setup for the growth regression is as follows.

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

y : real per capita GDP growth rate

[10] For example, a capital account openness variable may be 0 in 1982 and 2 in 1988. In this case, the change variable is all the same, but it doesn't show 'when' capital account liberalization occurs and how long the account is open for each country, which might differ.

[11] This might result in an empirical result that does not show the actual benefit of capital controls. More extensive and careful case studies of experiences with capital controls are needed in order to provide information about how capital account management technique is adopted in reality (Epstein et al., 2003).

X : control variables

In keeping with previous studies, the basic control variable set includes the log of initial real GDP per capita, average educational attainment for the period, institutional quality, and regional dummies similar to Rodrik (1998). Initial GDP is used to control for convergence, education reflects the level of human capital, and institutional quality is used to control for the level of institutional development that is crucial to growth (Levine and Renelt, 1992; Barro and Lee, 1993; Rodrik et al., 2002; IMF, 2003). We further include inflation, the black market premium and social variables such as ethnic fragmentation in the extended set. In our regressions, we report the 'level' of capital account openness on growth.[12] As Table 3 and 4 show, there is no evidence for a direct effect of capital account openness on growth. The result is robust to the choice of independent variables and regional dummies.

Table 3, 4.

In fact, this result is consistent with other studies using the simple IMF dummy. When we use Quinn's capital account openness index the result seems better, but it is still not statistically significant. A few studies including Quinn (1997) include the investment share in their regression model. We do not include it to focus on the most fundamental policy variables following Rodrik (1998) and others.[13] When the investment share is included, the coefficient of capital account liberalization using Quinn's level index is significant at 90%, which might explain the disparity of current studies (Edwards, 2001). However, this result is not robust to the inclusion of other variables in the extended control variables set, and therefore is not reported. When we use our capital account openness index with the much larger sample, capital account liberalization is not significant in any regressions.

In the subsample of non-OECD countries, the result is more favorable for liberalization, which is different from the result of Edwards (2001). In particular, Quinn's index seems to provide some evidence of correlation between openness and growth at the 90% of significance level, though with a small sample size. However other measures with larger samples do not yield significant results.[14] When we use the

[12] In addition, following Quinn (1997), we tested the 'change' of capital account openness using the difference between capital account openness in 95 and 76, using our index, but it is not significant for growth or investment.

[13] For example, Quinn (1997), Edwards (2001) and Edison et al. (2002) include the investment share, while Rodrik (1998), Kraay (1998), O'Donnel (2000), and Chanda (2000) do not include the investment share. It seems that studies including the investment share are more likely to have a more favorable result for capital account liberalization, but Arteta et al. (2001) report a skeptical result using the same specification used by Edwards (2001). We test both of the cases with and without the investment share, and find that with the investment share, the result tends to increase the benefit of liberalization more, but it is not significant.

[14] Our sample may include too many countries that may have problematic data. We carried out the same regressions in a smaller sample, excluding all former socialist countries and ones with population under one million, after which the sample size falls to 95. The result does not change in either sample of all countries and developing countries. In addition, we limited our sample to countries that have Quinn's index and tested using our index. Indeed, the result changes for the better, but no result is statistically significant in any samples, even including the investment share. We grouped countries in several ways and tested but again found no significant result for any.

'change' index for all regressions, the coefficient is not statistically significant. Thus, we conclude that there is no strong empirical evidence that the capital account liberalization can spur long-run growth from cross-country regressions.

Of course, the OLS cross-country study might be limited due to problems of reverse causality and omitted variables, and others use instrumental variables (Edwards, 2001; Kraay, 1998). However, it is not easy to find a good a instrumental variable for growth regressions. Rodrik (1998) argues that if there is a positive relation between openness and growth as mainstream economists think, it should result in strengthening the significance of the liberalization variable in growth regressions and overestimating it. Therefore, our result further supports the position that there is no positive relation.

(2) Liberalization, investment and its efficiency

In this section, we examine possible channels through which capital account liberalization may work, focusing primarily on investment share and investment efficiency. Mainstream economists argue that liberalization should lead to more capital flows that in turn encourage domestic investment and promote investment efficiency, as well. This is particularly important in developing countries with underdeveloped financial markets. Our regressions test the effect of capital account openness on domestic investment.

Table 5, 6, 7.

We find, surprisingly for the hypothesis just put forward, that liberalization shows significantly *negative* effects on the investment share.[15] This partly explains why the coefficient of liberalization is more significant in growth specification including the investment share than in ones without it. However, when we limit the sample to non-OECD countries, the result is insignificant.[16] It should be noted using the investment share as a measure for investment might be problematic since it is affected by efficiency of investment itself, which can decrease the capital-output ratio.[17] The fit for the model of the investment share appears to not be very good, showing a low R-square. Thus, though not reported, we further test using the growth rate of the investment amount. We find that the result is almost similar to the growth regression with no significant effect of liberalization on investment.

Our result shows that liberalization does not encourage investment, and may even lower it. Financial opening does not seem to help increase investment in the long run since it could worsen economic instability although short-run outcomes may differ.[18]

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[15] There is no good model for investment compared to growth. Interestingly, Kraay (1998) also reports the coefficient of liberalization is negative in the investment regression though not statistically significant. O'Donnel (2001)'s study covering the similar period reports that the coefficient is not negative, still statistically not significant. The difference may be due to the difference of the sample size since ours is much larger. When we use the smaller sample, as we mentioned, the result did not change.

[16] In fact, the investment rate may be lower in developed countries with more open accounts.

[17] I thank Professor Crotty for this important point.

[18] It may be possible that liberalization can encourage investment in the very short term as Henry (2001) finds. However, this investment growth might be excessive and just temporary, associated with an overlending and overborrowing syndrome. It might be not good for long run investment and growth (Demirguc-Kunt and Detragiache, 1998, c.f. Glick and Hutchinson, 1999)

Higher volatility would be an unfavorable condition for long-term investment, and studies show that higher instability impedes growth in the long run (Ramey and Ramey, 1995). Many have argued that FDI increases the investment rate and growth, but empirical studies show mixed results. Even if this is true, there is no clear evidence that openness encourages FDI (Mody and Murshid, 2002).[19] More importantly, proper government controls together with other development policies such as financial control may also be helpful to investment. For example, East Asian countries achieved a high productive investment in a climate of relatively closed capital accounts by regulating capital flight and controlling domestic and foreign capital effectively.

Another essential channel might be economic efficiency. It is argued that financial opening and free international capital flows aid economic efficiency by promoting better capital allocation, risk diversification and more competition (Obstfeld, 1994; Guitan, 1996) Some authors have recently argued that total factor productivity growth or efficiency of investment is more important than the mere increase of investment for economic growth (Easterly et al., 2000). To examine this, we test the growth model by simply adding an interaction term of investment and capital account liberalization, following Bekaert et al. (2002).

Table 8.

In Table 8, we find that the coefficient of the interaction term is not significantly positive, as with the extended set, and there is no evidence that capital account liberalization increases investment efficiency. It is understandable that capital account liberalization does not spur economic growth since none of the channels, usually argued by mainstream economists, seem to work.

2. Can liberalization spur growth under some desirable preconditions?

(1) Macroeconomic preconditions revisited

Because it is hard to find direct benefits of liberalization, economists have turned to the examination of preconditions under which policy can 'do the trick'. Most economists argue that some desirable preconditions are needed for the success of capital account liberalization. Some of these are: the level of growth, financial development and institutional quality (Eichengreen and Mussa, 1998; Edwards, 2001; Klein and Olivei, 2001). Arteta et al (2001) recently add macroeconomic balance and trade liberalization to the list in the name of sequential or orderly liberalization (Arteta et al., 2001). However, the financial market may be inherently inefficient even in developed countries with desirable conditions (Stiglitz, 2000), and Rodrik (1999) argues prudential regulation takes a long time to be established. Furthermore, it should be noted that capital controls may be helpful to growth under some conditions. This section studies such possible preconditions, using various measures of liberalization.[20]

We use the following techniques. We put the interaction term of capital account liberalization and the conditioning variable, and add the conditioning variable

[19] Some support this argument (Borensztein et al., 1998; Bosworth and Collins, 1999), while others including Carkovic and Levine (2001) report that FDI does not spur domestic investment.
[20] I am grateful to Professors Gerald Epstein and James Heintz for this important point.

independently in the controlling variable set. The mainstream hypothesis is that the interaction term of liberalization and the conditioning should be significantly positive.

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

$Condition_i$: preconditions variable
When we use condition variables, the variables are included in X set.

We focus on 3 capital account liberalization variables, the IMF capital account openness, Quinn's capital account openness, and our capital account openness index. We report the result of the regression in which the investment share is included and estimate models with both of the control variables set.

Table 9, 10.

The test of initial GDP as a precondition with the basic control variables set gives a significant negative sign on the interaction term, suggesting that the benefit of liberalization appears to become smaller in more developed countries. The result is weaker with extended control variables, but still significant when one uses Quinn's index.[21] This finding is contradictory to the mainstream argument (Edwards, 2001) but not unprecedented. The standard argument is not supported in other studies either (O'Donnel, 2001; Edison et al., 2002b). Klein (2003) recently reports that only middle income countries may benefit from liberalization due to a decreasing marginal benefit of openness on growth. Only with our capital account openness index do we find a similar result in table 10, which supports the hypothesis of an inverted-U shaped relation between the responsiveness of growth to capital account openness and the level of growth.[22] It might be possible that liberalization might only cause harm such as capital flight and instability in very poor countries while providing no benefit in already developed ones. In this case, then, poor countries may need controls while rich countries do not need opening. However when we divide samples according to the initial GDP, we do not find this result. In general, our result refutes the argument that liberalization is more helpful in more developed countries.

Table 11, 12.

In the regression with financial development as a precondition, we do not find evidence that liberalization encourages growth. The interaction term using the share of liquid liability to GDP as a proxy for financial development is not significant, and other

[21] It may explain why the effect of liberalization on growth is better in the non-OECD sample, though not significant.
[22] We test it with a quadratic function of the initial GDP with the setup of $y_i = b_1 + b_2 X_i + b_3 CAL_i * Y_i + b_4 CAL\ i * Y_i^2 + e_i$. For the hypothesis to be true, b_3 should be significantly positive and big, while b_4 should be negative and small. The last column of table 10 shows the result, so that capital account liberalization might help growth in middle income countries. Meanwhile, Mckenzie (2001) reports that the interaction of current account controls and initial GDP is positive and interprets it as evidence that controls may lower convergence of growth rate.

indicators of financial development, such as an index of stock market development and overall private credit, show the same result.

Testing for the effect of the education level, we find that the interaction term is negative, contrary to the argument that liberalization is helpful under some preordained absorptive capacity (Borensztein et al., 1998). The result is weaker in the non-OECD sample, which is similar to the case of initial GDP. Both tests of education and financial development do not show any non-linear relation that liberalization spurs growth in only countries with a medium level of development of education and the financial sector.

Table 13, 14.

Table 13 and 14 show that neither trade liberalization nor macroeconomic balance works as a precondition for successful capital account liberalization in almost all regressions.[23] We further test trade liberalization policy using the tariff rate and nontariff barrier index from Sachs and Warner (1995), but again fail to find a significant positive effect. Moreover, variables to indicate macroeconomic stability such as inflation and government consumption do not succeed as a precondition.[24] Arteta et al. (2001) show that a lower black market premium was an important condition for successful liberalization in the 1980s. Our result, by contrast, does not provide evidence for the so-called 'orderly' or 'sequential' liberalization argument.

(2) Institutions and financial structure

Some researchers argue that government quality or the development of overall institutions is essential for capital account liberalization to spur growth by helping financial markets work better. For example, it is argued that with less corruption the larger the growth effect of capital account liberalization will be, as more long-term capital inflows are encouraged (Prasad et al., 2003). To test this contention, we use the institutional quality variable, GADP (government antidiversion policy) index and other measures for corruption.[25]

Table. 15, 16.

In most regressions the interaction term of the openness index and institutional quality is significantly *negative* and the benefit of liberalization seems to become

[23] In the regression with the IMF dummy and the black market premium, the interaction term is significant at 90% level. However when we use the IMF index based on the reports, not the internally updated one, it becomes insignificant. It may be because the updated index mark several African countries open since 1990, while data from the original IMF reports mark them closed.

[24] Neither measures is significant as a precondition for liberalization to work in all regressions regardless of samples.

[25] GADP index is the most reliable and popular index for institutional quality, an average of several institutional variables such as bureaucratic quality, rule of law, corruption and others from Political Risk Services (Hall and Jones, 1999). This index is originally from the International Country Risk Guide (ICRG), first used by Knack and Keepfer (1995). For corruption measures there are also several candidates. See Appendix II for extensive explanation.

smaller in countries with better institutions.[26] There is no evidence that liberalization is helpful under conditions of less corruption. We also test for an inverse-U shaped relation hypothesis, but do not find any significant results. Our result casts serious doubt on the standard assertion that countries need to develop institutions to benefit from liberalization, but is consistent with other studies such as Kraay (1998) and Edison et al. (2002b).

It is undoubtedly true that institutions play a more crucial role than any other policies in spurring economic growth (Rodrik et al, 2002). However, it is not clear a priori whether a good institutional framework necessarily helps open capital markets encourage economic growth considering that financial markets are not inherently efficient. It is possible, for example, that capital controls work poorly in a country which has a large amount of corruption, and works well in situations where bureaucracies are capable and honest as seen in developmental states. To that extent, once the institutional framework is good, controls could be an effective development strategy, and thus better institutions may not be a condition for successful *liberalization*.

Lastly, we pose a question about the financial structure. Financial systems can be categorized as bank-based characterized by a close relationship between lenders and borrowers or market-based characterized by an arms-length relationship (Zysman, 1983). It is argued that there are benefits and costs of each system, and empirical studies show that the structure itself is not relevant to growth (Allen and Gale, 2000).[27] We are interested in the question as to the effect that this systemic difference has on the potential growth effects of liberalization.[28]

Table 17.

The result in Table 17, using stock market capitalization and private credit as measures of the financial structure, suggests that the financial system as such is not an important factor with respect to the difference between liberalization effects. Other measures including the stock market turnover give us the same result. More work needs to be done to assess the way that the corporate and financial sector work together. What may possibly be more important is the level of debt such as the high debt model in East Asia. In sum, we do not find any preconditions, including macroeconomic and institutional ones, for successful capital account liberalization.

[26] The interaction term becomes more significant without the investment share because GADP is significantly positive on investment and liberalization is significantly negative on it. The interaction term is not significant in the non-OECD sample but still negative.

[27] Many studies including Levine (2000a), Levine and Zervos (1998) and Ndikumana (2001) argue financial development is more important than structure. However, for underdeveloped countries, there is a good reason that the bank-based system could be more beneficial, as a recent empirical study by Tadesse (2001) shows (Singh and Weisse, 1998; Agiletta and Breton, 2001).

[28] Most of the empirical studies on the financial structure follow Levine's classification. However, Levine (2000a) categorizes the East Asian countries like Korea and Taiwan as a market-based system country. It is because he examined the credit from only commercial banks, ignoring the nonbank financial institutions (NBFIs). In fact, their share has been quite big in East Asian countries and their role is similar to banks. In this study, we use private credit from bank and nonblank financial institutions, and we use the stock market capitalization to credit ratio for the financial structure variable.

V. When capital controls, not liberalization, are helpful

1. Social structure and state intervention

In this section, we consider the possibility that capital controls encourage economic growth. We seek contexts under which capital account liberalization does harm to growth, or alternatively those under which controls encourage it. Since capital controls are a form of state intervention, it is likely, a priori that controls may be more successful under some circumstances that are desirable to state intervention. State intervention succeeded in a few countries such as in East Asia, where the institutional character of the state has been peculiar. These countries had developmental states that had been autonomous from other interest groups, which minimized rent-seeking activity (Amsden, 1989; Evans, 1995).[29] This stemmed from a lack of strong interest groups. Historically, equitable distribution and social homogeneity were good conditions for this, and helped the mobilization for growth (Rodrik, 1994). Thus, we test variables capturing the degree of egalitarian land distribution and the homogeneity of society in order to shed light on the institutional context around capital controls using all five indices.

Since the variable for capital controls is opposite to that for capital account liberalization, we simply use the number of the full liberalization minus the capital account liberalization index as a measure for capital controls (Mody and Murshid, 2002). We use same specifications that we used in previous sections, and interpret the sign of the controls index as an effect of capital controls.

Table 18 and 19 show that the interaction term of liberalization and homogeneity is negative. In the regression with a term for the inverse of land Gini coefficient, capital account liberalization seems to be detrimental to growth in countries with more equal land distribution when we use our openness index. The interaction term of liberalization and ethnic homogeneity is significantly negative and robust in almost all the regressions.[30] The result provides support for the hypothesis that capital controls *spurs* economic growth in more socially homogenous countries. Those countries are mainly East Asian countries such as South Korea.

2. Developmental state and high debt model with capital controls

Besides social structure, researchers point to effective and competent governance as being crucial for success of government intervention. Our previous finding that the interaction term of liberalization and institutional quality is significantly negative, suggests that capital controls are more likely to encourage growth in countries with better institutions. A typical test for institutional quality is to use the Government Anti Diversion Policy (GADP) index. This index, however, is limited as a measure for developmental states. It is constructed from survey results from consulting companies

[29] Of course, autonomy itself is never a sufficient condition for a developmental state. Some states, that are very autonomous, may try to extract people's wealth, and these are called 'predatory state'. We can categorize states into predatory states, captured states, developmental state according to their autonomy and their orientation. One of the characteristics of a developmental state is so-called 'embedded autonomy', autonomy combined with a close relationship with private businesses (Evans, 1995).

[30] The result also held for the non-OECD country samples when we use our capital account openness index.

and as such is an evaluation of business friendliness, which is usually higher in more developed countries. Consequently we use a new measure for the developmental state provided by Evans and Rauch (1999) in which states are ranked according to the quality of bureaucracy. The so-called 'Weberian state index' is a measure for governance to reflect to what extent government officials and organization fit the Weberian ideal (Evans and Rauch, 1999).

Table 20.

The result of the interaction term of the Weberian state index and capital account liberalization is insignificant for most specifications in Table 21. Only in one case with the extended variables set and our index is the effect significantly negative.[31] In fact, the sample size is small, and the index is currently under development.

Lastly, we examine the interaction of the corporate debt ratio and capital controls. The corporate debt level varies considerably across countries along with the financial system and the government policy. For instance, East Asian countries, excluding Taiwan, tend to have a higher debt ratio than other countries. Mainstream economists emphasize that a high level of debt contributed to financial crisis in those countries in 1997. Some heterodox economists by contrast, argue that a higher debt ratio encourages investment and growth, if managed efficiently by the government with capital controls. This is the so-called high debt model (Wade, 2000).[32] The combination of capital controls, domestic financial control and industrial policy lay behind the East Asian miracle (Nembhard, 1996). However, opening of financial markets to the market-based international financial market in the high debt bank-based model may aggravate vulnerability, and this incompatibility of financial systems offers an explanation for the East Asian crisis in 1997 (Rajan and Zingales, 1998). We test the hypothesis that the high-debt model can succeed with capital controls, using corporate debt data of International Finance Corporation from Demirgüç-Kunt and Maksimovic (1996).

Table 21.

Table 21 reports that capital controls and high corporate ratio are correlated with higher growth. Although the debt ratio alone is not relevant for growth, it becomes significant with the interaction term for capital controls. The interaction term is significantly negative in most of regressions and is robust with the extended control variables set. It implies that the high debt ratio encourages growth in countries with relatively strong capital controls, or alternatively that capital controls could encourage growth with higher corporate debt. Though the sample size is still small, this explains the successful experience of 'high debt model' countries based on capital controls that include East Asian and Scandinavian countries in our sample.

[31] When we exclude small city states such as Hong Kong and Singapore that have a high Weberian state index and are marked always open, the interaction term in the regression with our index with basic control variables also becomes significant at the 95% level.

[32] In this sense, the cause of the East Asian financial crisis was not the inherent problems of the Asian development model as such, but careless financial liberalization and opening that led to more vulnerability in the high-debt model (Singh, 1999; Chang, 1998).

VI. Panel regressions: pooled OLS and fixed effects model

1. Capital account liberalization and growth with panel method

This section provides results of panel regressions on the effect of capital account liberalization on growth. Though the cross-country analysis delivers important information about factors associated with long-term economic growth, it is well known that the analysis is limited.[33] Pure cross-country analysis cannot capture time-varying effects within a country, and moreover, there are other problems including endogeneity and simultaneity that cannot be easily addressed.

Recently, economists have started to apply the panel approach to examine economic growth, using several methods including the traditional OLS with pooled time-series cross-section data, a Least Square Dummy Variable (LSDV) method with fixed effects, and the random effects model (Islam, 1995). Sophisticated methods, such as the Generalized Method of Moments estimator, have been developed in which the specification has the character of a dynamic panel (Easterly and Levine, 2001; Levine et al., 2000; Beck and Levine, 2001).[34] It is difficult to apply this method in this study without a large number of temporal observations since the GMM method loses observations when it uses lagged variables and differences as instrumental variables. In addition, our capital account liberalization indices display little variation for some countries with no change in openness, which makes it hard for us to use the method. Thus, we only report results from a pooled OLS panel and a fixed effects panel method that assumes unobserved country-specific effects.

We use five-year averages for each country to control for cyclical effects.[35] For the capital account liberalization variable, we use our capital account openness index due to the low variance of other indices and the smaller sample size. Dummy variables for each period are included in the pooled OLS model. It should be noted that some variables such as preconditions have no temporal dimension since they are simply cross sectional with one observation for each country, and we should be careful about the interpretation of results.[36] We report the results derived from running a regression with the same form as the cross-country regressions.

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[33] In this regard, microeconomic studies must be the most desirable. If we use firm level or industry level data, we may overcome chronic problems of studies on macroeconomic variables like economic growth that may affect policy variables (Eichengreen, 2001). Also, empirical studies must be complemented by more extensive case studies. There is always a limit for cross-section empirical studies to capture the institutional contexts that vary across countries, which can be addressed by more case-oriented studies or comparative institutional approach. See Srinivasan and Bhagwati (1999).

[34] When there is a lagged dependent variable in the independent variables set, some develop a system of regressions in differences and levels together (Arellano and Bover, 1995; Blundell and Bond, 1998). For the recent development of dynamic panel data analysis, see Baltagi (2001) and Wooldridge (2002). Most of these studies use the Gauss DPD program by Arellano and Bond (1998) (from personal contact with Professor Levine). Howver, if one variable's variation is too low then it is hard to calculate the difference estimator.

[35] Our data are unbalanced to include as many observations as possible. Thus a few countries do not have all of the four of five-year averages.

[36] The fixed effects model assumes that there are unobserved country-specific effects related to independent variables to a different degree. It should be noted that the pooled OLS regressions already

Table 22.

Table 22 shows results of this test. In the pooled OLS model, we confirm the cross-country regressions: there is no evidence that capital account liberalization spurs growth. The LSDV model with fixed effects produces a different result. Here, capital account liberalization is statistically significant in the estimation of economic growth even after the inclusion of other control variables. The results appear to be somewhat sensitive to the choice of periods as we show in the table.[37]

It is intriguing that the results from the fixed effects model are different from other regressions. It is possible that capital account liberalization may encourages foreign capital inflows and possibly growth in the short run (Beakeart and Harvey, 2000; Henry, 2000a). However the benefit may be temporary and disappear in the medium to long run, especially if opening also aggravates instability (Demirgüç-Kunt and Detragiache, 1998). Rodriguez and Rodrik (1999) point out that the commonly used five-year average panel is not free from problems concerning the effect of lags and business cycles and they prefer using longer periods' averages. When we try 10-year averages and 20-year averages, there is indeed no tangible benefit from openness. While some claim that the fixed effects model could be superior, Hauk and Wacziarg (2003) shows that a cross-section OLS estimator is more consistent than the fixed effects model in growth regressions.

There are some reasons to be careful in the interpretation of the fixed effects model. Reverse causality might be serious in the fixed effects model than cross-country regressions as a country with higher growth is more likely to open its account than before. Further, we could not include important variables such as institutional quality because of a lack of data, and regional dummies as the fixed effects model controls too much. Thus, we may conclude that the results of panel regressions show only short-term benefit of liberalization, if any, while there is not long-term benefit. Edison et al. (2002b) recently use sophisticated panel techniques using capital flows variables and report that there is no evidence of benefit of international financial integration on economic growth.[38]

2. Channels and preconditions with panel regressions

We repeat the tests undertaken in the previous section using the panel data framework in Table 23 and 24.

Table 23, 24.

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include regional dummies and some variables such as institutional quality and ethnic fragmentation that could capture the country-specific effects to some extent.

[37] The seven-year average shows a significant result, but when we use annual panel data with fixed effects it is not significant and a 10-year average also gives an insignificant result. When we test it using random effects model with AR (1) process considering the dynamic panel setup it fails to pass the Hausman test.

[38] Our result is similar to the relation between income inequality and economic growth. Forbes (2000) reports that while most cross-country regressions have reported a negative relationship, she finds a positive relation using five-year average panel data. She shows that it is significant in the fixed effects model with country-specific fixed effects, while the pooled OLS produces an insignificant result. The result is not significant with the 10-year average.

The result in table 23 shows that there is no evidence that capital account liberalization encourages the investment share of GDP. Its effect on investment is again negative and the coefficient is significant in the pooled OLS[39], while the result in the fixed effects model is mixed. It is likely that the negative effects of liberalization in cross-sectional differences are partly offset by temporal effects, assuming country-specific unobserved effects. Neither panel regression gives evidence for the investment efficiency enhancing effects of liberalization in Table 24.

Next, we examine the potential preconditions for liberalization to be helpful to growth. Table 25 reports that the result of looking at macroeconomic variables which are typically thought of as preconditions: the initial GDP level, financial development, trade openness and the black market premium that vary across five-year period, which can show the temporal effect.

Table 25.

Table 25 shows that none of these variables can be said to help capital account liberalization in encouraging economic growth, either in the pooled OLS or fixed effects models.[40] The results support our findings from the cross-country regressions.

Table 26

Table 26 reports the results for the effect of capital controls under other preconditions including institutional development, corruption, ethnic fragmentation and land distribution. It should be noted that all of these variables have only one observation per country in our dataset, so that the result of the fixed effects model might be hard to interpret. The result of the pooled OLS regression is broadly consistent with the cross-country regressions in the former section. It seems likely that in countries with more fragmented ethnicity, less developed institutions and worse land distribution, capital account liberalization can spur economic growth, although this varies somewhat with the sample and controls. The result confirms the hypothesis that capital controls may be more helpful in more equal countries with better institutions.[41]

Table 27.

Table 27 reports the results using the Weberian state index and corporate debt ratio in panel setups. The results of the pooled OLS model verify our findings in cross-

[39] It is significant even in the non-OECD samples but with the extended sets for the non-OECD sample in the pooled OLS, the coefficient is not statistically significant.

[40] As in cross-country regressions, variables like the tariff level and non-tariff barriers were also tested and the results are all the same, though they are limited since our observation of them is limited to one for each country. In the panel regression with fixed effects, interestingly the interaction term between government consumption and capital account liberalization is significantly negative, which may suggest that liberalization may incur a higher cost when a government is not disciplined. However, it is not significant in the pooled OLS.

[41] However, the result of the fixed effects model is not statistically significant, which may not be exact because of only one observation of the condition variables for each country.

country regressions. The fixed effects model, by contrast, shows different results. The interaction term with the corporate debt level is negative and somewhat significant.

In sum, panel regressions show mixed results. On the whole, the pooled OLS model accords with the result of cross-country regressions, while the fixed effects model shows some positive relation between liberalization and growth in the short term with country-specific effects.

VI. Conclusions

Mainstream economists have long argued that liberalization and more open capital account should spur economic growth, at the very least under specific circumstances. However, the argument is not theoretically uncontested, and has had no clear empirical evidence to support it. Many of the countries that liberalized capital accounts have not been rewarded with higher growth, but they have frequently have seen more instability and undergone financial crises. Many recent empirical studies have struggled to find evidence that liberalization is beneficial, and have long been in search of several preconditions and channels that may need to be in place before liberalization may work. In spite of such efforts, studies have shown, at best, mixed results.

In this paper, we make far-reaching efforts to develop current empirical studies by constructing an extensive capital account openness index and shedding new light on the potential conditions for successful capital controls with both of the cross-country and panel methods. In cross-country regressions, we report that there is no evidence at all that capital account liberalization spurs growth. Nor is there any evidence that the commonly thought of preconditions are important for successful capital account liberalization. We cannot find any evidence that liberalization encourages investment or its efficiency.

Given this, we examine whether capital controls might be helpful to economic growth under some contexts and find some results to support this alternative hypothesis. Capital controls spur growth in countries that are ethnically more homogeneous, that have more equitable land distribution, that have better institutions, and in which there is a higher corporate debt ratio. These findings are consistent with the historical experience of the developmental state that achieved fast growth with capital controls.

Panel regressions show mixed results. The result of the pooled-OLS is consistent with the cross-country regression in general, while the fixed-effects model shows that the benefit of capital account liberalization is larger, even if only for the short run. The examination of potential preconditions in the OLS panel regressions supports our findings in cross-section regressions in most cases. Thus, we may conclude that there is no strong empirical evidence to support capital account liberalization, at least its perceived effects on long-term growth.

Our study presents serious concerns about the salience of capital account liberalization policy everywhere. It is time for policy makers to think carefully about a blind push toward capital account liberalization.

Table 2. Sample statistics and correlation of each capital account openness indexes

	Mean	Standard deviation	Minimum	Maximum
IMF capital account openness	0.328	0.470	0	1
IMF overall account openness	1.600	1.087	0	3
Quinn's capital account openness	2.902	0.928	0	4
Quinn's overall account openness	10.357	3.084	1	14
Our capital account openness	2.015	1.077	0	4

Correlation matrix	IMF cap open	IMF overall open	Quinn's cap open	Quinn's overall open	Our cap open
IMF cap open	1.000	0.835	0.674	0.689	0.688
IMF overall open	0.835	1.000	0.732	0.817	0.657
Quinn's cap open	0.674	0.732	1.000	0.915	0.977
Quinn's overall open	0.689	0.817	0.915	1.000	0.903
Our cap open	0.688	0.657	0.977	0.903	1.000

Table 3. Capital account liberalization and economic growth with basic set

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Intercept	4.233***	4.457***	5.215***	4.835***	4.325***
	(3.46)	(3.78)	(3.53)	(3.19)	(3.61)
Initgdpcap	-1.211***	-1.262***	-1.306***	-1.222***	-1.222***
	(-5.28)	(-5.47)	(-3.83)	(-3.49)	(-5.05)
Eduratio	0.021**	0.022**	0.011	0.011	0.021**
	(2.06)	(2.18)	(0.84)	(0.81)	(2.08)
GADP	8.380***	8.403***	7.645***	7.964***	8.421***
	(5.95)	(5.97)	(3.54)	(3.64)	(5.97)
CAL	-0.224	0.017	0.373	0.045	-0.056
	(-0.39)	(0.08)	(1.47)	(0.53)	(-0.22)
EA	2.813***	2.722***	2.566***	2.6220***	2.755***
	(4.79)	(4.66)	(4.79)	(4.64)	(4.92)
LAAM	-0.020	-0.014	-0.166	-0.133	-0.024
	(-0.05)	(-0.03)	(-0.30)	(-0.24)	(-0.05)
SAF	-1.819***	-1.810***	-2.650***	-2.629***	-1.814***
	(-3.84)	(-3.82)	(-3.20)	(-3.10)	(-3.83)
Adjusted R-square	0.583	0.582	0.576	0.560	0.583
No. of observation	108	108	60	60	108

Note : t-value in parenthesis
1) ***: significant at 1% level, **: at 5% level, *: at 10% level.
2) GDP per capita growth rate is percentage growth rate, calculated by
(log of real GDP per capita in 95 - log of real GDP per capita in 76)/ 19
3) Initgdpcap : log of GDP per capita in 1976.
3) GADP: government antidiversion index from ICRG, Hall and Jones (1999).
4) Eduratio: secondary level education ratio of all population, from WDI.
5) Quinn's indexes are for 1982 and 1988 for all countries, all years for OECD countries.
6) EA: East Asian countries dummy, LAAM: Latin American countries dummy, and SAF: South African countries dummy
7) Same in following tables.

Table 4. Capital account liberalization and economic growth with extended set

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Intercept	7.219***	7.221***	7.397***	6.939***	7.337***
	(5.92)	(6.28)	(5.58)	(5.31)	(6.11)
Initgdpcap	-1.257***	-1.147***	-1.417***	-1.314***	-1.252***
	(-5.82)	(-5.30)	(-5.09)	(-4.74)	(-5.57)
Eduratio	0.027***	0.025***	0.012	0.015	0.027***
	(3.12)	(2.89)	(1.06)	(1.33)	(3.06)
GADP	5.532***	5.363***	7.701***	7.890***	5.740***
	(4.16)	(4.10)	(4.42)	(4.60)	(4.32)
CAL	-0.576	-0.449**	0.075	-0.075	-0.211
	(-1.09)	(-2.10)	(0.34)	(-1.10)	(-0.97)
EA	2.377***	2.517***	2.168***	2.251***	2.225***
	(4.29)	(4.60)	(4.49)	(4.65)	(4.09)
LAAM	0.279	0.013	0.421	0.568	0.271
	(0.73)	(0.34)	(0.88)	(1.18)	(0.71)
SAF	-1.583***	-1.534***	-1.635**	-1.699*	-1.555***
	(-3.50)	(-3.53)	(-2.31)	(-2.42)	(-3.46)
Inf	-0.002***	-0.002***	-0.002**	-0.002***	-0.002***
	(-2.72)	(-2.75)	(-2.13)	(-2.52)	(-2.77)
BMP	-1.808***	-2.131***	-1.713***	-1.708***	-1.777***
	(-4.20)	(-4.64)	(-3.53)	(-3.55)	(-4.17)
Ethfrag	-1.773***	-1.781***	-1.257*	-1.200*	-1.820***
	(-3.01)	(-3.16)	(-1.96)	(-1.91)	(-3.12)
Adjusted R-square	0.691	0.701	0.718	0.724	0.690
No. of observation	100	100	58	58	100

Note:
1) BMP, black market premium index, calculated by log (1 + (bmp / 100)) from Global Development Dataset, Easterly and Levine (2001).
2) Ethfrag: ethnic fragmentation index from Krain (1997).

Table 5. Capital account liberalization and investment with basic set

Dependent variable: the share of investment to GDP (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Intercept	21.791***	22.251***	21.289***	20.981***	21.096***
	(4.84)	(5.14)	(5.53)	(5.42)	(4.84)
Initgdpcap	0.101	0.170	0.218	0.308	0.564
	(0.12)	(0.20)	(0.25)	(0.34)	(0.64)
Eduratio	0.024	0.021	-0.042	-0.037	0.015
	(0.65)	(0.58)	(-1.19)	(-1.04)	(0.41)
GADP	0.915	1.324	7.594	7.122	1.822
	(0.18)	(0.26)	(1.35)	(1.27)	(0.35)
CAL	-3.115	-1.318*	-1.032	-0.355*	-1.849**
	(-1.48)	(-1.62)	(-1.55)	(-1.66)	(-2.16)
EA	8.700***	8.737***	7.987***	8.335***	8.245***
	(4.02)	(4.07)	(5.72)	(5.78)	(4.05)
LAAM	-2.366	-2.745*	-2.645*	-2.502*	-2.487
	(-1.52)	(-1.75)	(-1.84)	(-1.74)	(-1.62)
SAF	-3.163*	-2.851	-7.506***	-7.683***	-3.226*
	(-1.81)	(-1.64)	(-3.48)	(-3.57)	(-1.87)
Adjusted R-square	0.243	0.246	0.538	0.541	0.261
No. of observation	108	108	60	60	108

Table 6. Capital account liberalization and investment with extended set

Dependent variable: the share of investment to GDP (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Intercept	19.628***	21.228***	23.851***	23.858***	19.396***
	(4.15)	(4.66)	(5.68)	(5.72)	(4.24)
Initgdpcap	0.684	0.695	-0.190	-0.126	1.077
	(0.82)	(0.81)	(-0.22)	(-0.14)	(1.26)
Eduratio	0.028	0.027	-0.015	-0.009	0.019
	(0.83)	(0.79)	(-0.43)	(-0.25)	(0.57)
GADP	-2.710	-2.872	8.296	7.800	-0.965
	(-0.53)	(-0.55)	(1.51)	(1.43)	(-0.19)
CAL	-4.052*	-1.551**	-1.598**	-0.517**	-2.212**
	(-1.98)	(-1.83)	(-2.28)	(-2.38)	(-2.62)
EA	8.771***	8.811***	7.010***	7.800***	7.601***
	(4.08)	(4.06)	(4.59)	(5.47)	(3.67)
LAAM	-2.180	-2.604**	-1.636	-1.366	-2.335
	(-1.47)	(-1.72)	(-1.08)	(-0.89)	(-1.60)
SAF	-3.113*	-2.600	-7.082***	-7.098***	-3.179*
	(-1.78)	(-1.49)	(-3.16)	(-3.18)	(-1.85)
Inf	-0.004*	-0.004*	-0.002	-0.002	-0.004**
	(-1.81)	(-1.77)	(-0.89)	(-0.88)	(-1.99)
BMP	2.390	1.637	0.676	0.697	2.366
	(1.43)	(0.90)	(0.44)	(0.46)	(1.45)
Ethfrag	-1.406	-2.062	-1.821	-2.357	-1.310
	(-0.61)	(-0.92)	(-0.90)	(-1.18)	(-0.59)
Adjusted R-square	0.321	0.317	0.493	0.497	0.342
No. of observation	100	100	58	58	100

Table 7. Capital account liberalization and investment with basic set, in non-OECD countries

Dependent variable: the share of investment GDP (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Intercept	17.659***	18.289***	17.282***	17.506***	17.173***
	(3.49)	(3.81)	(3.78)	(3.87)	(3.50)
Initgdpcap	-0.318	-0.437	-0.148	-0.298	0.006
	(-0.34)	(-0.47)	(-0.15)	(-0.30)	(0.01)
Eduratio	0.064	0.067	-0.009	-0.009	0.055
	(1.55)	(1.59)	(-0.22)	(-0.23)	(1.31)
GADP	11.953*	12.186*	15.883**	16.469**	11.900*
	(1.87)	(1.91)	(2.43)	(2.48)	(1.89)
CAL	-1.275	-0.264	0.033	0.127	-0.968
	(-0.48)	(-0.28)	(0.04)	(0.46)	(-0.92)
EA	5.369**	5.150*	4.861**	4.319*	5.538**
	(2.03)	(1.94)	(2.54)	(2.01)	(2.21)
LAAM	-3.433**	-3.498**	-3.570**	-3.762**	-3.402**
	(-2.07)	(-2.10)	(-2.23)	(-2.30)	(-2.06)
SAF	-3.184*	-3.498**	-8.958***	-9.039***	-3.193*
	(-1.74)	(-2.10)	(-3.93)	(-3.98)	(-1.76)
Adjusted R-square	0.325	0.323	0.634	0.637	0.330
No. of observation	87	87	40	40	87

Table 8. Capital account liberalization and investment efficiency with basic set

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Intercept	1.663	2.717	3.148	4.199	2.240
	(1.08)	(1.37)	(1.09)	(1.28)	(1.21)
Initgdpcap	-1.166***	-1.285***	-1.309***	-1.255***	-1.252***
	(-5.14)	(-5.50)	(-3.79)	(-3.54)	(-5.09)
Eduratio	0.016*	0.020**	0.014	0.015	0.019*
	(1.59)	(2.01)	(0.99)	(1.01)	(1.89)
GADP	8.395***	8.281***	7.074***	7.413***	8.249***
	(6.20)	(6.10)	(3.22)	(3.29)	(6.07)
Invest	0.102***	0.080	0.093	0.037	0.094*
	(3.05)	(1.51)	(0.94)	(0.32)	(1.86)
CAL	1.937	0.066	0.624	-0.009	0.241
	(0.92)	(0.09)	(0.75)	(-0.03)	(0.37)
Invest*CAL	-0.085	0.003	-0.007	0.003	-0.007
	(-0.94)	(0.02)	(-0.20)	(0.28)	(-0.23)
EA	2.435***	1.955***	1.985***	2.024***	2.123***
	(3.46)	(2.82)	(2.86)	(2.70)	(3.31)
LAAM	0.169	0.215	0.041	0.009	0.179
	(0.41)	(0.51)	(0.07)	(0.01)	(0.43)
SAF	-1.497***	-1.578***	-2.025**	-2.232**	-1.539***
	(-3.21)	(-3.35)	(-2.11)	(-2.15)	(-3.32)
Adjusted R-square	0.617	0.615	0.577	0.556	0.614
No. of observation	108	108	60	60	108

Note:
1) Invest: share of domestic capital formation to GDP from WDI.

Table 9. Capital account liberalization, growth and preconditions: initial GDP

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
InitGDP	-1.013***	-0.767*	-0.853
	(-4.29)	(-1.72)	(-2.57)
CAL	5.725**	3.300**	2.050*
	(2.11)	(2.12)	(1.79)
InitGDP*CAL	-0.679**	-0.342*	-0.228*
	(-2.14)	(-1.85)	(-1.74)
Adjusted R-square	0.631	0.603	0.626
No. of observation	108	60	108
Extended set			
InitGDP	-1.227***	-0.778**	-1.043***
	(-5.74)	(-2.16)	(-3.45)
CAL	3.270	3.243**	1.480
	(1.30)	(2.64)	(1.39)
InitGDP*CAL	-0.415	-0.383**	-0.178
	(-1.42)	(-2.56)	(-1.43)
Adjusted R-square	0.728	0.748	0.727
No. of observation	100	58	100

Note:
1) InitGDP = log of real GDP per capita in 1976
2) In the basic control variables set, the investment share is added.
3) Other variables not reported.

Table 10. Capital account liberalization, growth and preconditions: initial GDP

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
InitGDP	-1.059***	-1.102*	-1.396***
	(-4.47)	(-2.15)	(-3.47)
CAL	-11.297	-2.780	-6.060
	(-0.93)	(-0.57)	(-1.64)
InitGDP*CAL	3.531**	1.044	1.612**
	(1.20)	(0.97)	(1.99)
$InitGDP^2$*CAL	-0.252	-0.077	-0.100**
	(-1.44)	(-1.31)	(-2.30)
Adjusted R-square	0.635	0.675	0.641
No. of observation	108	60	108
Extended set			
InitGDP	-1.255***	-0.934**	-1.580***
	(-5.81)	(-2.12)	(-4.15)
CAL	-7.552	0.636	-6.033*
	(-0.63)	(0.15)	(-1.71)
InitGDP*CAL	2.272	0.205	1.547*
	(0.78)	(-0.22)	(1.98)
$InitGDP^2$*CAL	-0.162	-0.032	-0.095**
	(-0.93)	(-0.63)	(-2.24)
Adjusted R-square	0.727	0.744	0.739
No. of observation	100	58	100

Note:
1) InitGDP = log of real GDP per capita in 1976
2) In the basic control variables set, the investment share is added.
3) Other variables not reported.

Table 11. Capital account liberalization, growth and preconditions: financial development

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
LLY	1.547	-0.660	1.509
	(1.50)	(-0.32)	(1.00)
CAL	0.900	0.480	0.268
	(0.96)	(1.18)	(0.71)
LLY*CAL	-1.943	-0.660	-0.421
	(-1.36)	(-0.32)	(-0.78)
Adjusted R-square	0.610	0.571	0.603
No. of observation	105	60	105
Extended set			
LLY	0.572	-1.881	1.045
	(0.62)	(-0.99)	(0.73)
CAL	0.132	0.133	0.121
	(0.15)	(0.37)	(0.34)
LLY*CAL	-1.030	0.233	-0.452
	(-0.76)	(0.36)	(-0.78)
Adjusted R-square	0.726	0.723	0.725
No. of observation	98	58	98

Note:
1) LLY: Liquid liability / GDP, from Levine et al.(2000). For some countries it starts from 1982.

Table 12. Capital account liberalization, growth and preconditions: secondary level education ratio

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
Eduratio	0.029**	0.044*	0.036*
	(2.52)	(1.91)	(2.16)
CAL	1.923	1.456**	0.597
	(1.47)	(2.14)	(1.26)
Eduratio*CAL	-0.028**	-0.015**	-0.008
	(-1.60)	(-1.57)	(-1.20)
Adjusted R-square	0.623	0.596	0.620
No. of observation	108	60	108
Extended set			
Eduratio	0.028***	0.042**	0.040***
	(2.90)	(2.27)	(2.77)
CAL	0.566	1.106**	0.435
	(0.48)	(2.06)	(1.05)
Eduratio*CAL	-0.011	-0.015*	-0.007
	(-0.74)	(-1.97)	(-1.26)
Adjusted R-square	0.723	0.734	0.726
No. of observation	100	58	100

Table 13. Capital account liberalization, growth and preconditions: trade openness (export + import) to GDP

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
TO	0.012*	-0.005	0.013
	(1.80)	(-0.32)	(1.44)
CAL	0.353	0.302	0.192
	(0.43)	(0.82)	(0.57)
TO*CAL	-0.008	0.002	-0.002
	(-0.91)	(0.46)	(-0.79)
Adjusted R-square	0.627	0.571	0.626
No. of observation	108	60	108
Extended set			
TO	0.003	-0.014	0.004
	(0.53)	(-0.91)	(0.40)
CAL	-0.461	-0.060	-0.019
	(-0.51)	(-0.16)	(-0.05)
TO*CAL	0.002	0.005	-0.000
	(-0.21)	(0.84)	(-0.03)
Adjusted R-square	0.721	0.710	0.720
No. of observation	100	58	100

Note:
1) TO : trade openness, calculated by (export + import)/GDP from WDI.

Table 14. Capital account liberalization, growth and preconditions: macroeconomic imbalance, black market premium

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
BMP	-1.754***	-4.643***	-3.175***
	(-3.33)	(-3.03)	(-2.88)
CAL	-0.241	0.139	-0.109
	(-0.44)	(0.56)	(-0.47)
BMP*CAL	-5.356*	1.759	0.652
	(-1.70)	(1.62)	(0.93)
Adjusted R-square	0.697	0.705	0.686
No. of observation	103	59	103
Extended set			
BMP	-1.729***	-4.005**	-3.114***
	(-3.44)	(-2.28)	(-2.90)
CAL	-0.01	0.013	-0.083
	(-0.02)	(0.05)	(-0.37)
BMP*CAL	-3.157	1.554	0.753
	(-1.00)	(1.33)	(1.13)
Adjusted R-square	0.725	0.722	0.725
No. of observation	100	58	100

Table 15. Capital account liberalization, growth and preconditions: institutional quality

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
GADP	10.627***	12.393***	11.784***
	(6.72)	(3.86)	(5.19)
CAL	3.990**	1.888**	1.142*
	(2.49)	(2.71)	(1.93)
GADP*CAL	-5.878**	-2.218**	-1.572*
	(-2.63)	(-2.19)	(-1.91)
Adjusted R-square	0.639	0.613	0.628
No. of observation	108	60	108
Extended set			
GADP	7.245***	13.260***	9.063***
	(4.72)	(5.05)	(4.28)
CAL	2.094	1.598***	0.896*
	(1.40)	(2.94)	(1.70)
GADP*CAL	-3.390*	-2.415***	-1.423*
	(-1.64)	(-2.91)	(-1.88)
Adjusted R-square	0.730	0.757	0.732
No. of observation	100	58	100

Note:
1) GADP: government antidiversion index, from International Country Risk Guide. Hall and Jones (1999).

Table 16. Capital account liberalization, growth and preconditions: corruption

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
NoCorrupt	0.406**	0.413	0.477
	(2.13)	(1.06)	(1.60)
CAL	1.973	1.086*	0.863
	(1.39)	(1.79)	(1.42)
NoCorrupt*CAL	-0.556*	-0.147	-0.157
	(-1.71)	(-1.03)	(-1.15)
Adjusted R-square	0.542	0.541	0.537
No. of observation	90	58	90
Extended set			
NoCorrupt	0.295*	0.768**	0.401
	(1.84)	(2.09)	(1.49)
CAL	0.448	1.047*	0.589
	(0.36)	(1.92)	(1.05)
NoCorrupt*CAL	-0.227	-0.207	-0.097
	(-0.78)	(-1.60)	(-0.78)
Adjusted R-square	0.678	0.616	0.622
No. of observation	86	57	88

Note:
1) NoCorrupt: corruption index from Knack and Keepfer (1995). the higher the less corruption.
2) In the regressions with corruption index, we exclude the GADP index in the control variable set.

Table 17. Capital account liberalization, growth and preconditions: financial system

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	Quinn's capital account	Capital account openness index
Basic set			
FS	1.542	1.877	0.904
	(0.67)	(0.72)	(0.29)
CAL	-0.007	0.381	0.070
	(-0.01)	(1.27)	(0.24)
FS*CAL	-0.556	-0.307	0.070
	(-0.18)	(-0.37)	(0.07)
Adjusted R-square	0.605	0.653	0.605
No. of observation	70	55	70
Extended set			
FS	1.612	1.388	1.600
	(0.68)	(0.57)	(0.48)
CAL	0.089	0.146	0.027
	(0.12)	(0.50)	(0.09)
FS*CAL	-1.018	-0.246	-0.222
	(-0.29)	(-0.28)	(-0.19)
Adjusted R-square	0.646	0.701	0.646
No. of observation	67	53	67

Note:
1) FS: stock market capitalization / credit from deposit money banks and financial institutions, from IFS, other measures also tested.

Table 18. Capital account liberalization, growth and precondition: Ethnic homogeneity

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Basic set					
Ethhom	3.235***	4.368***	3.470*	4.171*	4.981***
	(3.92)	(3.48)	(1.71)	(1.84)	(3.31)
CAL	2.976**	1.50**	0.996*	0.240	1.278**
	(2.62)	(2.61)	(1.72)	(1.43)	(2.54)
Ethhom*CAL	-4.623**	-1.577**	-0.904	-0.341	-1.567**
	(2.54)	(2.31)	(-1.02)	(-1.29)	(-2.26)
Adjusted R-square	0.648	0.647	0.587	0.568	0.646
No. of observation	103	103	59	59	103
Extended set					
Ethhom	2.943***	3.609***	2.325	4.063**	4.499***
	(4.14)	(3.27)	(1.41)	(2.32)	(3.38)
Capcon	2.125**	0.387	0.467	0.130	0.883**
	(2.18)	(0.97)	(0.97)	(1.00)	(1.99)
Ethom*CAL	-4.324***	-1.229**	-0.544	-0.361*	-1.406**
	(-2.78)	(-2.07)	(-0.76)	(1.78)	(-2.30)
Adjusted R-square	0.744	0.741	0.715	0.732	0.737
No. of observation	100	100	58	58	100

Note :
1) Ethhom : ethnic homogeneity index, Ethhom = 1 – Ethnic fragmentation, from Krain (1997).

Table 19. Capital account liberalization, growth and precondition: equal land distribution

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Basic set					
InvLGini	0.014	0.014	0.041	0.064	0.084**
	(0.70)	(0.37)	(0.94)	(1.34)	(-2.33)
CAL	1.033	0.221	0.680	0.224	1.050**
	(0.69)	(0.35)	(1.36)	(1.22)	(2.06)
InvLGini*CAL	0.022	-0.005	-0.016	-0.007	-0.035**
	(0.54)	(-0.24)	(-0.95)	(-1.37)	(-2.31)
Adjusted R-square	0.638	0.610	0.636	0.635	0.677
No. of observation	51	51	43	43	51
Extended set					
InvLGini	0.001	-0.003	0.034	0.038	0.068*
	(0.54)	(-0.08)	(0.87)	(0.84)	(2.02)
CAL	0.910	-0.224	0.670	0.104	0.972**
	(0.65)	(-0.36)	(1.42)	(0.57)	(2.03)
InvLGini*CAL	0.011	0.005	-0.012	-0.004	-0.027*
	(0.29)	(0.12)	(-0.82)	(-0.81)	(-1.96)
Adjusted R-square	0.707	0.675	0.731	0.715	0.733
No. of observation	51	51	43	43	51

Note:
1) InvLGini = 100 – Land Gini, from Deininger and Olinto (2000).

Table 20. Capital account liberalization, growth and precondition: Weberian state index

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Basic set					
Webscale	0.108	0.079	0.453*	0.515	0.415
	(0.78)	(0.38)	(2.00)	(1.65)	(1.67)
CAL	0.165	-0.027	1.596*	0.490	1.486
	(0.06)	(-0.02)	(1.98)	(1.22)	(1.60)
Webscale*CAL	-0.029	0.016	-0.140	-0.051	-0.145
	(-0.08)	(0.11)	(-1.40)	(-1.14)	(-1.35)
Adjusted R-square	0.623	0.624	0.612	0.556	0.661
No. of observation	33	33	30	30	33
Extended set					
Webscale	0.063	-0.077	0.830*	0.724	0.723*
	(0.41)	(-0.30)	(1.77)	(1.45)	(1.95)
CAL	-0.833	-1.249	2.533*	0.625	1.959*
	(-0.27)	(-0.89)	(1.97)	(1.06)	(1.77)
Webscale*CAL	0.006	0.123	-0.370	-0.093	-0.343*
	(0.01)	(0.67)	(-1.53)	(-1.22)	(1.83)
Adjusted R-square	0.604	0.616	0.512	0.431	0.659
No. of observation	31	31	28	28	31

Note:
1) Webscale: Weberian state index, from Evans and Rauch (1999).
2) In the regression with Weberian state index, we exclude GADP index.

Table 21. Capital account liberalization, growth and precondition: Corporate debt

Dependent variable: average real GDP per capita growth rate (from 1976 to 1995)

Independent Variables	IMF capital account	IMF combined	Quinn's capital account	Quinn's overall account	Capital account openness index
Basic set					
Debt ratio	0.402*	1.529**	1.193*	1.669**	1.319**
	(1.86)	(2.57)	(1.77)	(2.30)	(2.01)
CAL	1.321	0.565	1.285**	0.360**	1.237**
	(1.34)	(-1.20)	(2.64)	(2.31)	(2.50)
Debt*CAL	-1.215**	-0.673**	-0.347	-0.144**	-0.402
	(-2.49)	(-2.52)	(-1.40)	(-2.10)	(-1.68)
Adjusted R-square	0.865	0.866	0.868	0.849	0.866
No. of observation	29	29	28	28	29
Extended set					
Debt ratio	0.432	2.358**	2.429**	3.583***	1.856**
	(1.43)	(2.54)	(2.28)	(4.10)	(2.21)
CAL	1.463	1.743	2.025**	0.644***	2.071**
	(0.85)	(1.65)	(2.56)	(3.11)	(2.46)
Debt*CAL	-1.246*	-1.005**	-0.785**	-0.319***	-0.580*
	(-1.92)	(-2.49)	(-2.06)	(-3.92)	(-1.94)
Adjusted R-square	0.806	0.827	0.822	0.879	0.824
No. of observation	27	27	26	26	27

1) Corporate debt ratio is debt / equity, from Demirgüç-Kunt and Maksimovic (1996).

Table 22. Capital account liberalization and economic growth: panel analysis

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

Independent Variables	Pooled OLS with period dummy (5-year average)	Fixed effects: LSDV with country and period dummy (5-year average)	Fixed effects: LSDV with country and period dummy (4-year average)
Intercept	4.227***	44.839***	49.189***
	(3.49)	(7.49)	(8.50)
Initgdpcap	-1.194***	-7.501***	-7.646***
	(-4.90)	(-8.30)	(-8.68)
Eduratio	0.018*	0.035	0.009
	(1.89)	(1.47)	(0.42)
GADP	9.410***		
	(6.24)		
CAL	-0.186	1.132***	0.501
	(-0.92)	(2.67)	(1.25)
EA	3.056***		
	(5.39)		
LAAM	-0.065		
	(-0.15)		
SAF	-1.951***		
	(-3.92)		
Adjusted R-square	0.264	0.586	0.515
No. of observation	438	447	559

Note :
1) Initial GDP is a log of GDP in the first year of each 5 year period.
2) GDP per capita growth rate is percentage growth rate for each 5 year period. For example, calculated by
(log of real GDP per capita in 80 - log of real GDP per capita in 76)/ 4.
3) For CAL variable, we use our extensive capital account openness index.
4) For 4-year average regression, education ratio of 75 used for 76-79 period since there are no data for that period.
5) For the fixed effects model, we report R-square instead of adjusted one.
6) Period dummy not reported. Same in following tables.

Table 23. Capital account liberalization and investment: panel analysis

Dependent variable: the share of investment to GDP for 5-year period

Independent Variables	Pooled OLS with period dummy	Pooled OLS For non-OECD	Fixed effects with country and period dummy	Fixed effects with country and period dummy for non-OECD
Intercept	17.677***	12.308***	-19.327**	-22.5956**
	(6.97)	(4.22)	(-2.03)	(-2.16)
Initgdpcap	1.089**	0.698	5.987***	6.324***
	(2.13)	(1.22)	(4.16)	(4.01)
Eduratio	0.010	0.045*	-0.093**	-0.078
	(0.49)	(1.95)	(-2.40)	(-1.51)
GADP	-1.498	9.826***		
	(-0.48)	(2.50)		
CAL	-1.430***	-0.851*	0.400	0.834
	(-3.36)	(-1.68)	(0.59)	(1.02)
EA	8.130***	5.826***		
	(6.87)	(4.11)		
LAAM	-2.372**	-3.097***		
	(-2.56)	(-3.13)		
SAF	-2.969***	-2.661**		
	(-2.85)	(-2.40)		
Adjusted R-square	0.247	0.298	0.772	0.777
No. of observation	434	353	442	362

Table 24. Capital account liberalization and investment efficiency: panel analysis

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

Independent Variables	Pooled OLS with period dummy	Fixed effects: LSDV with country and period dummy
Intercept	1.759	48.664***
	(1.07)	(7.81)
Initgdpcap	-1.265***	-8.653***
	(-5.08)	(-9.55)
Eduratio	0.016	0.048**
	(1.67)	(2.02)
GADP	9.422***	
	(6.28)	
Invest	0.123**	0.205***
	(2.90)	(3.25)
CAL	0.260	1.064
	(0.48)	(1.27)
Invest*CAL	-0.013	-0.004
	(-0.62)	(-0.14)
EA	2.362***	
	(3.83)	
LAAM	0.189	
	(0.43)	
SAF	-1.609***	
	(-3.23)	
Adjusted R-square	0.291	0.631
No. of observation	433	442

Note :
1) Invest is the share of investment to GDP for each 5 year period.

Table 25. Capital account liberalization, growth and preconditions: initial GDP, financial development, trade openness, and black market premium, panel analysis

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

Condition Variables	Initial GDP	Financial development	Trade openness	Black market premium
Pooled OLS with period dummy				
Condition	-0.946***	1.666	0.018**	-3.325**
	(-2.92)	(1.09)	(2.00)	(-3.56)
CAL	1.563	0.167	0.220	-0.310
	(1.55)	(0.47)	(0.71)	(-1.30)
Condition*CAL	-0.192	-0.668	-0.004	1.045*
	(-1.64)	(-1.17)	(-1.50)	(1.78)
Adjusted R-square	0.295	0.270	0.297	0.304
No. of observation	433	388	433	391
LSDV: Fixed effects				
Condition	-8.711***	2.154	0.028	0.494
	(-8.53)	(0.70)	(1.39)	(0.36)
CAL	0.856	0.754	0.984*	1.153**
	(0.51)	(1.31)	(1.69)	(2.56)
Condition*CAL	0.013	0.330	-0.001	-0.687
	(0.07)	(0.32)	(-0.18)	(-0.81)
R-square	0.631	0.638	0.636	0.641
No. of observation	442	391	442	394

Note:
1) In the control variables set, the investment share is added.
2) For pooled OLS, basic control variables set used.
3) For financial development variable, liquid liability/GDP used.
4) In the fixed effect model we exclude the GADP index, thus the number of observation may be different. Also the fixed effect model delete the observation when the cross section has only one observation.

Table 26. Capital account liberalization, growth and preconditions: institutional development and corruption, panel analysis

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

Condition Variables	GADP	No corruption	Ethnic fragmentation	Equal land distribution
Pooled OLS with period dummy				
Condition	13.181***	0.369	6.471***	0.073**
	(5.78)	(1.46)	(4.51)	(2.23)
CAL	1.020*	0.736	1.511***	1.018**
	(1.87)	(1.59)	(3.18)	(2.27)
Condition*CAL	-1.655**	-0.133	-2.035***	-0.027**
	(-2.12)	(-1.22)	(-3.08)	(-2.06)
Adjusted R-square	0.298	0.303	0.274	0.338
No. of observation	433	362	413	201
LSDV: Fixed effects				
Condition	--	--	--	--
CAL	1.293	1.0073	0.828	0.160
	(1.18)	(1.37)	(0.93)	(0.22)
Condition*CAL	-0.532	-0.060	0.088	0.024
	(-0.33)	(-0.33)	(0.07)	(1.24)
R-square	0.631	0.691	0.629	0.693
No. of observation	430	360	420	200

Note:
1) In the regressions with corruption index, we exclude the GADP index in the control variable set.
2) For equal land distribution, inverse Gini coefficient used, calculated by 100-landgini

Table 27. Capital account liberalization, growth and preconditions: Weberian state index and corporate debt : panel analysis

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

Condition Variables	Weberian State index	Corporate Debt ratio
Pooled OLS with period dummy		
Condition	0.344*	0.879*
	(1.88)	(1.80)
CAL	1.317**	1.062**
	(2.09)	(2.15)
Condition*CAL	-0.098	-0.241
	(-1.28)	(-1.47)
Adjusted R-square	0.504	0.472
No. of observation	129	115
LSDV: Fixed effects		
Condition	--	--
CAL	1.408	0.410
	(1.12)	(0.34)
Condition*CAL	0.080	0.007
	(0.50)	(0.03)
R-square	0.724	0.634
No. of observation	129	114

Note:
1) We exclude the GADP index in the regression with the Weberian state index

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< Appendix I. Sophisticated capital account opening index >

I. Quinn's index and our index

Because of the limit of the simple dummy index from the IMF report, some have made efforts to construct continuous measures for capital account opening and controls. Among these, Quinn's index is the first that is the most popular and well-known among those. In order to capture the intensity of capital controls, Quinn originally made continuous index with a value from 0 to 4 with a scale of 0.5, after reviewing the text of the IMF report carefully.[42] He gives each 2 for receipts and payments of international capital flows. His coding rule for capital receipts is as followings and the same decision rule is applied to capital payments.

> If approval is rare and surrender of receipts is required, then X=0.
> If approval is required and sometimes granted, then X=.5.
> If approval is required and frequently granted, then X=1.
> If approval is not required and receipts are heavily taxed, then X=1.5.
> If approval is not required and receipts are not taxed, then X=2 (Quinn, 1997, p. 544.).

Based on this rule, he presents the following example of coding in his paper (Quinn, 1997). According to him, the capital account restriction has a value of 0.5 for India in 1979 for example, while the US has a value of 2 and Sweden has 1.5.

India

Capital: Payment

Residents are prohibited, except with Reserve Bank permission, from engaging in any transaction which increases beyond 49 percent the nonresident share of business outside India … and they are also prohibited, except with Reserve Bank permission, from holding, acquiring, transferring, or disposing of immovable property outside India. … Furthermore, Reserve Bank approval is required for residents exporting Indian securities to any place outside India and transferring Indian securities to nonresidents (IMF 1980 report, p. 196) Indian nationals are not normally granted any exchange facilities fro emigration purposes (p. 197).

Comments: Approval required, rarely granted. Score: 0.5

Capital: Receipts

All proposals for direct investment in India, with or without equity participation, are reviewed by the Foreign Investment Board. … The General or specific approval of the Reserve Bank is necessary for the continuance of commercial, industrial, or trading activities in India or companies incorporated abroad, or with more than 40 percent nonresidents interest (p. 191). [Details of conditions for continuation of business in Indai provided, including equity dilution formulas. pp. 195-61.] In exceptional cases, companies that do not meet these criteria but have developed skills …, or use technologies not indigenously available, may be permitted a more than a 40 percent foreign participation. … Branches of

[42] Quinn also constructed the index for others such as current account restriction, exchange rate restriction and IMF article VIII and multilateral agreement. He puts 4 to current account restrictions and 2 to exchange restrictions and others, so that his total for all restrictions is from 0 to 12. He tries this overall openness measure in his study to find less significant result in his study (Quinn, 1997). The weight might be arbitrary and we focus on the capital account restriction in our study.

foreign companies other than airlines, shipping companies, and liaison offices must in all cases become Indian companies (p. 196).

Comments: Approval required for all direct investments. Extensive and pervasive indigenous equity requirements. Some "national interest" investments permitted outside guidelines. Score: 0.5

United States

Capital: Payment

Incoming or outgoing capital payments by residents or nonresidents are not subject to exchange controls. In addition inward and outward direct or portfolio investment is generally free of any other form of approval (IMF 1980 report. p.424).

Comments: Essentially free. Score : 2.0

Capital: Receipts

Incoming or outgoing capital payments by residents or non-residents are not subject to exchange controls. In addition inward and outward direct or portfolio investment is generally free of any other form of approval (p.424).

Comments: Free. Scroe: 2.0

Sweden

Capital: Payment

Direct investment abroad by Swedish residents requires individual authorization, which normally is granted only if the investment is considered likely to promote exports or otherwise to benefit the balance on the current account, regardless of the return on the investment. … Residents do not need authorization to sell portfolio holdings of foreign securities to nonresidents. The purchase of both listed and unlisted securities by residents from nonresidents requires authorization. As a rule, such authorization is not granted (p. 385).

Comments: Approval required for direct investments; some capital payments and capital sales permitted. Score: 1.0

Capital: Receipts

Foreign direct investments in Sweden require authorization, which normally is given, provided that not more than 50 percent of each individual investment (investments below SKr 5 million excepted) is financed with domestic credit. … Residents are permitted to receive capital receipts from abroad only upon approval of the Riksbank (p. 384). … Permission is needed for the issuance of bonds and shares in Sweden by nonresidents; bond issues in favor of other Scandinavian countries and [the World Bank] have been admitted (p. 385).

Comments: Approval required for all large and many small nonresidents financial activities. Some approvals denied. Score: 1.0 (Quinn, 1997, pp. 541-544).

Although this index is also limited in that it doesn't show the concrete form of capital controls like foreign direct investment or portfolio investment and doesn't capture the important level of enforcement, it is the most reliable. In fact, most of recent studies use this index. Interestingly enough, Quinn (Quinn, 1997) and Edwards (Edwards, 2001) report that if we introduce this continuous index capital account liberalization is helpful to economic growth, while the simple IMF dummy fails to show the benefit. But Arteta et al. (Arteta et al., 2001) show thta the result is very weak and still the debate is going on. However, this index is made public only for several years, which makes it real hard to develop the empirical study (Eichengreen, 2001). For OECD countries, all years' index from 1958 to 1997 is available but for emerging countries the index is available only for 1958, 1972, 1982 and 1988. Moreover, the coverage of countries is only 70 countries in total. In fact, more recent efforts like

Quinn's developed so recently but the result is not available yet and seems problematic as I already pointed out (Brune et al., 2001).[43]

In this study, we construct the Quinn-like index, reviewing the IMF report following his way for more years and more countries.[44] Because it is necessary to have better measures of capital account openness to examine the real effect of capital account liberalization, our effort is essential to develop the current empirical study. In particular, for the panel study to capture the time-varying effect, we need more years' index,. Thus we follow the following coding rule, slightly developed but very similar to original Quinn's.

If approval is rare and surrender of receipts is required, then X=0.
If approval is required in most parts and sometimes granted, then X=.5.
If approval is required in some parts and frequently granted, then X=1.
If license or any regulation exist in most parts, then X=1.
If approval is not required and receipts are heavily taxed, then X=1.5.
If approval is required in only few parts and usually granted, then X=1.5
If license or any regulation exist only in a few parts, then X=1.5
If approval is not required and receipts are not taxed, then X=2
If regulation doesn't exist in almost all parts, then X=2.

Based on this, we construct our Quinn-like index for more years than Quinn's index is available. Thus, we code the capital account restriction part for almost all countries, that is, more than 100 countries in the IMF report. We exactly follow Quinn's approach, but we complement it with more criteria for clear coding. After that, we compare our index with Quinn's original index for consistency. Though the work is manual and might be arbitrary, this way we can improve the consistency and reduce potential mistakes . But when we find that Quinn's original index is not correct or clear, after reading the IMF report carefully, we use our own measures in its place.[45] We report the correlation of Quinn's original index with others, including the IMF dummy and volume measuress.

[43] Brune et al. (2001)'s index is too extreme since they put 0 wherever controls are (Nancy et al., 2001). We examine their index carefully, although their data are available only for the average in the 70s' and the 1990s in their working paper, and find it problematic. For example, the index for Korea has not changed in the 70s' and even in the 1990s with all 0.

[44] In addition to Quinn's criteria, we add some more for to help clear coding. If license is needed and there is regulation in most parts, then we put 1, and if license is needed and there is regulation in a few parts the score is 1.5.

[45] For example, Quinn's index is 3.5 for Finland in 1993. However, the text of the IMF report of 1994 doesn't mention any restrictions and more inward liberalization adopted in 1993 so that our score is 4 for Finland in 1993. There are a few cases like this but the overall correlation between our index and Quinn's index is so high.

Table. Our capital account openness index for 1995, based on 1996 IMF report

Country name	code	receipts	payments
Albania	ALB	1	1
Algeria	DZA	0.5	0.5
Angola	AGO	0.5	0.5
Argentina	ARG	1.5	1.5
Australia	AUS	1.5	1.5
Austria	AUT	1.5	2
Bahamas	BHS	1	0.5
Bahrain	BHR	2	2
Bangladesh	BGD	1	0.5
Barbados	BRB	0.5	0.5
Belgium	BEL	2	2
Benin	BEN	1	0.5
Bhutan	BTN	0.5	0.5
Bolivia	BOL	1	1
Botswana	BWA	1	1
Brazil	BRA	1.5	1
Bulgaria	BGR	1	1
Burkina Fa	BFA	1	0.5
Burundi	BDI	1	1
Cameroon	CMR	1	0.5
Canada	CAN	2	2
Central African Rep.	CAF	1	0.5
Chad	TCD	1	0.5
Chile	CHL	1	1
China, Rep.	CHN	0.5	0.5
Colombia	COL	1	1
Congo	COG	1	0.5
Costa Rica	CRI	1.5	2
Cote d'Ivoire	CRI	1.5	1
Cyprus	CYP	1	1
Czech	CZE	1	1
Denmark	DNK	2	2
Dominica	DMA	0.5	0.5
Dom. Rep. Y	DOM	1	1
Ecuador	ECU	1.5	1
Egypt	EGY	1.5	1.5
El Salvador	SLV	1	1
Equatorial Guinea	GNQ	2	1
Ethiopia	ETH	0	0.5
Fiji	FJI	1	1
Finland	FIN	2	2
France	FRA	1.5	2
Gabon	GAB	1	1
Gambia	GMB	1	1
Germany	DEU	2	2

Ghana	GHA	1	0.5
Greece	GRC	1.5	2
Grenada	GRD	0.5	0.5
Guatemala	GTM	2	2
Guinea	GIN	0.5	0
Guinea-Bisau	GNB	1	0.5
Guyana	GUY	0.5	0.5
Haiti	HTI	0.5	0.5
Honduras	HND	1.5	1.5
Hong Kong	HKG	2	2
Hungary	HUN	1	1
Iceland	ISL	1.5	1.5
India	IND	1	0.5
Indonesia	IDN	1.5	1.5
Iran	IRN	1.5	1
Ireland	IRL	2	2
Israel	ISR	1	1
Italy	ITA	2	2
Jamaica	JAM	2	2
Japan	JPN	2	1.5
Jordan	JOR	1.5	0.5
Kenya	KEN	1.5	1.5
Korea	KOR	1.5	1
Kuwait	KWT	2	2
Lebanon	LBN	2	2
Lesotho	LSO	0.5	0.5
Liberia	LBR	2	2
Libyan Arab Rep.	LBY	0.5	0.5
Madagaskar	MDG	1	1
Malawi	MWI	1	0.5
Malaysia	MYS	1.5	1.5
Maldives	MDV	1	1
Mali	MLI	1	0.5
Malta	MLT	1	1
Mauritania	MRT	1	0.5
Mauritius	MUS	2	2
Mexico	MEX	1.5	1.5
Morocco	MAR	2	1.5
Mozambique	MOZ	0.5	0.5
Myanmar	MMR	1	0.5
Namibia	NAM	1	1
Nepal	NPL	1	1
Netherland	NLD	2	2
New Zeal	NZL	1.5	2
Nicaragua	NIC	1.5	1.5
Niger	NER	1	0.5
Nigeria	NGA	1	1
Norway	NOR	2	2

Oman	OMN	2	2
Pakistan	PAK	1	1
Panama	PAN	2	2
Papua New Guinea	PNG	1	1
Paraguay	PRY	1	1
Peru	PER	1.5	1.5
Philippines	PHL	1.5	1
Poland	POL	1	1
Portugal	PRT	1.5	2
Qatar	QAT	2	2
Romania	ROM	1.5	1
Russia	RUS	1	1
Rwanda	RWA	1	0.5
Saudi Arab	SAU	2	2
Senegal	SEN	1	1
Sierra Leone	SLE	1	1
Singapore	SGP	2	2
South Africa	ZAF	1	1
Spain	ESP	1.5	1.5
Sri Lanka	LKA	1	0.5
Sudan	SDN	0.5	0.5
Swaziland	SWZ	0.5	0.5
Sweden	SWE	2	2
Switzerland	CHE	2	2
Syrian Arab Rep.	SYR	1	1
Tanzania	TZA	1	1
Thailand	THA	1.5	1
Togo	TGO	1	0.5
Trinidad	TTO	2	2
Tunisia	TUN	1	1
Turkey	TUR	1.5	1
Uganda	UGA	1	1
United Arab Emirates	ARE	2	2
U.K.	GBR	2	2
U.S.	USA	2	2
Uruguay	URY	2	1.5
Venezuela	VEN	1	0.5
Vietnam	VNM	1	1
West. Sa.		1	0.5
Rep of Yemen	YEM	1.5	1.5
Zaire	ZAR	0.5	0.5
Zambia	ZMB	1.5	1.5
Zimbabwe	ZWE	1	0.5

< Appendix II: Variables and data list >

Our data cover as many as about 100 countries, from 1976 to 1995. Sample size depends on the data availability

I. Measures for capital account liberalization

1. IMF capital controls/openness index
: from Mody and Murshid (2002). and also constructed from the IMF report, *Exchange Arrangements and Exchange Restrictions*. It describes restrictions on inflows and outflows of capital account, current account and exchange rate extensively.

2. Quinn's index
: from Quinn (1997). For his coding rule, see Quinn, 1997, pp. 541-547.

3. Our capital account openness index
: similar to Quinn's for more years and countries (see Appendix I)

II. Macroeconomic variables

1. GDP
: real GDP per capita from World Development Indicator (WDI). 2001.

2. Investment share
: domestic capital formation/GDP from WDI

3. Financial development
1) Stock market
: stock market total value traded / GDP, or stock market capitalization / GDP
2) Financial intermediation
: liquid liability / GDP or private credit from banks to nonfinancial sector / GDP, from Levine et al. (2000) and International Financial Statistics (IFS)

4. Education
: average secondary school enrollment percent of total population from WDI.

5. Inflation rate
: consumer price index (CPI) growth from WDI

6. Government consumption
: government consumption / GDP from WDI

6. Trade liberalization
1) Trade flows / GDP
: export + import / GDP from WDI.
2) Black market premium:

: degree of distortion of the official exchange rate from the market exchange rate, from Global Development Dataset by Easterly and Levine (2001). originally from various sources.
3) Tariff and non-tariff barrier
: own-import weighted average tariff and non-tariff on import and intermediate and capital goods, from Sachs and Warner (1995). originally from UNCTAD

III. Institutions Variables

1. Institutional quality
1) GADP index
: government antidiversion index, average of law and order, bureaucratic quality, corruption, risk of expropriation and government repudiation of contracts indexes, average from 84 to 94, based on the survey of International Country Risk Guide (ICRG). from Hall and Jones (1999)

2) Corruption index I
: Knack and Keeper's corruption index based on ICRG, originally in Knack and Keefer (1995). From Easterly et al. (1989)

3) Corruption index II
: from Mauro (1995) based on the survey of Business International

4) Weberian state index
: from Evans and Rauch (1999) to show how ideal Weberian the state is, based on the survey about meritocratic hiring, an internal promotion and career stability and civil service compensation.

2. Ethnic fragmentation index
: new extensive ethnical fragmentation data, from Krain (1997) originally based on *World Handbook of Political and Social Indicators*. He calculates the proportion of the population of each ethnic group to the total population of the country and then squaring it. Next, he sums the squared proportions for all groups and subtracts that number from 1 to come up with the fractionalization measure. He coded data by a decade including 1948, 1958, 1968, 1978, and we use the average.

3. Land distribution
: Land Gini coefficient, from Deininger and Olinto (2000)

4. Index for financial structure
: ratio of stock market total value traded/GDP and private credit from banks and nonblank financial institutions, from Levine (2000) and also International Financial Statistics from the IMF

6. Corporate debt ratio
: debt / equity, International Finance Corporation's data from Demigruc-Kunt and Maksimovic (1996)