Financial Development in Asia:
Thresholds, Institutions and the Sequence of Liberalization

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Abstract

We investigate the nexus between capital account liberalization, legal and institutional development, and financial development, focusing on Asia. Utilizing a panel encompassing 87 less developed and emerging market countries over the period 1980 to 2000, we explore the following two issues. First, we test whether financial openness leads to equity market development after controlling for the level of legal and institutional development. Then, we examine the contentious issue of the optimal sequence of liberalization, i.e., whether the opening of the goods sector is a precondition for financial opening. Our empirical results suggest that a higher level of financial openness spurs the development of equity markets only if a threshold level of general legal systems development has been attained, a condition prevalent among emerging market Asian countries in particular. Among Asian countries, a higher level of law and order and the lower levels of corruption enhance the effects of financial opening. In contrast, bureaucratic quality does not seem to be important. In both less developed and Asian samples, we also find that the finance-related legal/institutional variables do not enhance the effect of capital account opening as strongly as the general legal/institutional variables. On the issue of sequencing, we uniformly find that liberalization of cross-border goods transactions is a precondition for capital account liberalization. When we account for the endogeneity of financial openness using trade openness, we still find that the general level of legal development still remains important. We interpret this finding as evidence that trade openness is a prerequisite for successful inducement of financial development via capital account liberalization.

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1. Introduction

The Asian crisis of 1997-98 confronted policy makers with the conundrum of financial globalization. While more open financial markets can contribute to economic development, it is the openness of financial markets that can make developing countries more vulnerable to financial disruptions (Kaminsky and Schmukler, 2001a,b, 2002 and Schmukler 2003).[1]

Despite the experience of the 1990's, East Asian policy makers do not appear to have abandoned the path of financial liberalization. Rather, as is best exemplified by the Chiang Mai Initiative, they have re-emphasized economic development through more integrated financial markets in the region. The progress in financial development has occurred against a backdrop of regional trade arrangements. As Pomfret (2005) documents, the Asian currency union also started being discussed in the region, signifying the importance of how to sequence liberalization policies.[2] In sum, the debate is not whether to liberalize, but that of how to liberalize. This study attempts to inform that debate.

A common view is that capital account liberalization leads to the development of financial markets that channel funds to borrowers with the most productive investment opportunities.[3] Theory suggests several mechanisms for this occurrence. First, financial liberalization may mitigate financial repression in protected financial markets, allowing the real interest rate to rise to its competitive market equilibrium (McKinnon, 1973; Shaw, 1973). Second, the removal of capital controls allows domestic and foreign investors to engage in more portfolio diversification, thereby reducing the cost of capital, and increasing the availability of funds.[4] Third, and not least, the liberalization process usually increases the efficiency of the financial system by weeding out inefficient financial institutions and creating greater pressure for a reform of the financial infrastructure, alleviating information asymmetry issues such as adverse selection and moral

[1] In this study we do not discuss the merits of capital controls in the context of financial crises, however. For a review, see Aizenman (2002). Kletzer and Mody (2000) survey the debate in the context of "self-protection policies" for emerging markets. Ito (2004) investigates the correlation between financial liberalization and the output performance of crisis-hit economies.
[2] See Eichengreen (2004) for the arguments about the ingredients for the Asian currency union.
[3] See for instance Leahy, *et al.* (2001) for OECD-specific results. Klein and Olivei (2001) document the linkage between financial development and economic growth for developed countries, and its absence for less developed countries. Spiegel (2001) examines an APEC sample, while Arteta, Eichengreen and Wyplosz (2001) document the fragility of many of these group-specific results. IMF (2001, Chapter 4) surveys both the growth and finance, and finance and liberalization literatures. For the most recent review on finance and growth, refer to Quinn, *et al.* (2002)
[4] See Shultz (1999), Henry (2000), and Bekaert et al.(2000, 2001).

hazard (Claesens et al., 2001; Stulz, 1999; Stiglitz 2000).

The link between financial liberalization and financial development is not unambiguous, however. One common argument is that to benefit from more open cross-border financial transactions, financial systems need to be equipped with reasonable legal and institutional infrastructure. Specifically, in economies where the legal system does not clearly define property rights or guarantee the enforcement of contracts, the incentives for loan activities can be limited. Legal protections for creditors and the level of credibility and transparency of accounting rules are also likely to affect economic agents' financial decisions.[5] La Porta, Lopez-de-Silanes, Shleifer, and Vishny (hereafter LLSV, 1997, 1998) and Levine (1998, 2003) show that low levels of shareholder rights are associated with poorly developed equity markets (especially in French civil law countries), while Claessens, et al. (2002) and Caprio, et al. (2003) find that greater creditor rights are positively associated with financial intermediary development.

The ambiguity can be empirically reconciled by incorporating explicitly the level of legal and institutional development. We hypothesize that financial liberalization can lead to financial development only if the economic system is equipped with a reasonable level of legal and institutional development.

In this paper, we also examine another oft-discussed issue related to the sequence of liberalization, that is, the order of liberalization in goods and financial markets. The prominent work by McKinnon (1991) argue that liberalization in the trade sector must precede liberalization in the capital account transactions. Rajan and Zingales (2003) argue that financial liberalization can lead to financial development only when the economy is open in both cross-border trade and capital flows because the economic openness can lead to weakening the political power of incumbent financial institutions to oppose further financial development. Aizenman and Noy (2004), while investigating countries' motivations for capital controls, find that financial openness and trade openness are bidirectional though the causality from the former to the latter is found to be more pervasive than the other. Given the ongoing debates over the manner in which to implement financial and real integration in Asia, we think this question is of central importance.

In our empirical exploration, we conduct a panel data analysis encompassing 87

[5] For the analysis of legal development on financial development, see also Beck and Levine (2003), Johnson, et al. (2000), Levine, Loayza, and Beck (2000) and Rajan Zingales (1998). For a general discussion on the importance of legal and institutional foundations for financial development, see Beim and Calomiris (2001).

developing and emerging market countries (including 15 Asian countries) and twenty years ranging from 1980 to 2000. In our econometric analysis, we pay special attention to financial development in the equity market sector and attempt to highlight any special attributes of the Asian region.

Our empirical results suggest that a higher level of legal and institutional development contributes both directly and indirectly with financial openness to the development of equity markets, but only if a country is equipped with a certain level of legal and institutional development. This finding is applicable not only to the group of less developed countries in general, but also to that of the Asian economies. We further surmise that many of the Asian emerging market countries have been more successful in reaping the benefits of financial liberalization because of their relatively higher levels of legal and institutional development. Higher levels of bureaucratic quality, and of law and order, as well as the lower levels of corruption, have enhanced the effects of financial opening in fostering the development of equity markets for less developed countries in general, while only the absence of corruption and a high index of law and order matter for the Asian countries. In examining the issue of the sequencing, we find that the liberalization in cross-border goods transactions is found to be a precondition for capital account liberalization among all the sample groups. When we account for the endogeneity of financial openness using trade openness as an instrument, we confirm that financial liberalization leads to financial development.

2. Overview of Financial Development and Financial Openness in Asia

First, we take an overview of the development of financial markets in less developed countries, focusing on the Asian economies. The original dataset includes 108 countries, out of which 22 are industrialized countries (IDC), 87 less developed countries (LDC), and 15 Asian countries (ASIA).[6] See Appendix 1 for the composition of the sample.

2.1Financial Development in Asia

[6] There is also a subgroup of emerging market countries, EMG. The definition of this group relies upon the International Financial Corporation's (IFC) indices, and refers to the countries which were included in either IFC's Global, Investible, or Frontier Index as of 1995. By this definition, there are 31 EMG countries in our sample. The Asian subgroup does not include Japan. Asian EMG refers to the Asian countries that are also categorized as EMG.

We draw on the work of Beck, Demirgüc-Kunt, and Levine (2000), using the following four financial development variables (*FD*). *PCGDP*, the ratio of private credit from deposit money banks to the private sector, represents the overall development in private banking markets.[7] While this variable is examined for purposes of comparison, our focus is primarily on the development of equity markets development, for which we use three variables as the measures: *SMKC* (stock market capitalization), *SMTV* (total value of stocks traded), and *SMTO* (stock market turn over ratio). We can consider *SMKC* as the measure of the size of equity markets and *SMTV* and *SMTO* as the measure of the activeness of equity markets.[8]

Figures 1(a)-(d) illustrate financial development measured in the above variables for different subsamples. In addition to IDC, LDC, and ASIA, we also have the subgroups of non-Asian less developed countries and Latin American countries for comparison purposes. These figures show that the Asian region historically achieved high level of financial development compared to other less developed countries. In fact, these countries' financial development has been as rigorous as industrialized countries in both banking and equity markets development. Also, its achievement during the 1990s is remarkable despite the Asian financial crisis.

Table 1 reports the growth rates of the financial development variables. Inspection of the table reveals that while during the 1990s, all subsample groups experienced the most rapid development in equity markets, measured along several dimensions, including size (*SMKC*) and transactions activity (*SMTV* and *SMTO*). This is true despite the retrenchment in the equity markets of less developed and emerging market countries during the second half of the decade. Again, despite the crisis, the speed of Asian financial development in recent years is striking.

2.2 Financial Openness in Asia

We measure the extent of financial openness using the capital account openness index, *KAOPEN* developed by Chinn and Ito (2002). Many researchers have used binary variables based

[7] While many researchers use M2 or liquidity liabilities (*M2Y* and *LLY* in our data set), we only report results for *PCGDP* as our focus is on equity market development, and also because the correlation between *M2Y* or *LLY* and *PCGDP* is quite high (84.9% and 81.9%, respectively).

[8] In this study, we do not look into offshore markets as part of financial development, and therefore, focus merely on the development of domestic equity markets. Although we have witnessed that some Asian emerging market countries such as Korea and Thailand tried to complement their domestic markets by developing offshore markets and allowing foreign investors, mostly hedge funds, to actively engage, there have not developed so much literature regarding these issues, mainly owing to the recentness of the development of hedge funds and offshore markets (except for Fung and Hsieh, 2001; Brown and Goetzmann, 2001; and Brown et al., 1998). Furthermore, the relationship between onshore

upon the IMF's categorical enumeration reported in *Annual Report on Exchange Arrangements and Exchange Restrictions* (*AREAER*)[9] and others such as Quinn (1997) and Miniane (2004) have created more delicate measures. However, the consensus is that such measures fail to fully capture the complexity of real-world capital controls.[10,11] This index is the first principle component of the four IMF binary variables, and higher values indicate greater financial openness. By the nature of its construction, we can assume the index measures the intensity of capital controls, insofar as the intensity is correlated with the existence of other restrictions on international transactions.[12] Most importantly, its coverage is the largest among the existent capital account openness indexes (108 countries for 1970 – 2000). Appendix 2 explains with more details how *KAOPEN* is constructed.

Table 2 presents the averages of *KAOPEN* and its changes for the full sample period of 1970 – 2000 and each decade for different sample groups.[13] What is striking here is that the Asian subgroup has been steadily increasing the extent of capital account openness throughout the three decades, whereas the less developed and emerging market subgroups reduced the level of financial openness during the 1980s (see the bottom half of the table). Figure 2 shows the development of financial openness for the subgroup of Asia, non-Asian LDC, and Latin American countries. Again, it appears that Latin American countries restricted capital account transactions throughout the 1980s despite its relative openness during the 1970s, and rapidly reopened financial markets after the 1990s. The Asian subgroup did slow down, though not restrict, financial openness during

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and offshore funds has not been rigorously investigated (except for Kim and Wei, 2002) due to data unavailability.

[9] There are binary variables created based on a set of "on-off" clarification, which includes an indicator variable for the existence of multiple exchange rates (k_1); restrictions on current account (k_2); capital account transactions (k_3); and a variable indicating the requirement of the surrender of export proceeds (k_4). k_3 is the one often used for capital controls.

[10] See Edison and Warnock (2001), Edwards (2001), and Edison et al. (2002) for discussions and comparisons of various measures on capital restrictions.

[11] The Quinn index is a composite measure of financial regulation and based upon Quinn's coding of the qualitative information contained in the *AREAER* pertaining to k_2 and k_3, augmented by information regarding whether the country in question has entered into international agreements with international organizations such as the OECD and EU. The Quinn index is available for the OECD members between 1958 and 1997, but the coverage for the less developed countries is limited to certain years (1958, 1973, 1982, 1988, and 1997). Johnson and Tamirisa (1998) investigated the empirical determinants of capital controls and used the recently created disaggregate components of capital controls publicized in the *AREAER*. However, the time series of the variables only covers years after 1996. Most recently, Miniane (2004) constructed a set of indices to measure the intensity of capital controls essentially in the same way as Johnson et al., but extending the data back to 1983 for 34 countries.

[12] By the nature of its construction, one may argue that the *KAOPEN* index measures the *extensity* of capital controls because it may not directly refer to the stringency of restrictions on cross-border transactions, but to the existence of different types of restrictions. However, measuring the extensity of capital controls may be a good proxy to the measure of intensity of capital controls.

[13] The cross-sectional average of *KAOPEN* for the full sample period is zero by construction.

the 1980s, but increased the level of financial openness in the 1990s, though the Asian crisis led these countries to restrict capital account transactions.

3. An Econometric Analysis

In what follows, we extend Chinn and Ito (2002) and investigate the issues relevant to the sequence of liberalization.

3.1 The Empirical Specification

First, we will examine the long-term effect of capital account openness on financial development in a model that controls for the level of legal and institutional development. The model is specified as:

$$(1)\ FD_t^i - FD_{t-5}^i = \gamma_0 + \rho FD_{t-5}^i + \gamma_1 KAOPEN_{t-5}^i + \gamma_2 L^i + \gamma_3 (L^i \times KAOPEN_{t-5}^i) + X_{t-5}^i \Gamma + u_t^i,$$

where *FD* is a measure of financial development; *KAOPEN* is a measure of financial openness; ***X*** is a vector of economic control variables; and L^i refers to a measure of legal or institutional development.

For the financial openness variable, we use the Chinn-Ito index. The vector ***X*** contains macroeconomic control variables that include log per capita income in PPP terms, the inflation rate, and trade openness, measured as the ratio of the sum of exports and imports to GDP. In this analysis, the set is kept fairly small so as to retain some interpretability of the correlations. Log per capita income is included as there is a long literature ascribing financial deepening, aside from the role of regulation, to the increasing complexity of economic structures associated with rising income. The inflation rate is included because it may distort decision-making.[14] In particular, moderate to high inflation may discourage financial intermediation, and encourage saving in real assets. Finally, trade openness is included as an ad hoc control; many empirical studies find a correlation of trade openness with any number of economic variables. The relationship between trade openness and financial openness will be investigated more thoroughly in a later section.

[14] Since in most cases, the volatility of inflation rises with the inflation rate, the inflation rate could be proxying for either or both of these effects.

A series of regressions is conducted for each of the four financial development variables (*FD*): *PCGDP*, *SMKC*, *SMTV*, and *SMTO*. For the series of regressions with different financial development measures, we also include each of the four legal/institutional variables and its interactive term with the capital account openness index. Further discussions about the legal/institutional variables are presented in the data section.

In order to avoid problems of endogeneity associated with short-term cyclical effects, we specify our model as a growth rate on levels regression, akin to a panel error-correction model with non-overlapping data. That is, we only sample data every five years between 1980 and 2000, and use the five-year average growth of the level of financial development as the dependent variable and the "initial conditions" for time-variant explanatory variables, including the initial level of the financial development indicator, for each five-year panel.[15] The regressions are conducted for 87 less developed and emerging market countries.

3.2 The Data

The data are originally recorded at an annual frequency, over the 1970-2000 period, covering 108 countries and drawn from a number of sources, primarily the World Bank's *World Development Indicators*, the IMF's *International Financial Statistics*, and the databases associated with Beck, Demirgüc-Kunt, and Levine (2000).

Measures of Legal/Institutional Development

The legal/institutional variables used in this study contains the measures related to the general development of legal systems and institutions, namely *LEGAL1*, *Corrupt*, *LAO*, and *BQ*. *LEGAL1* is the first principal component of the other three variables, and we treat this variable as a representative measure of the general level of legal/institutional development.[16] *Corrupt*, *LAO*, and *BQ* measure the level of corruption, law and order, and the quality of the bureaucratic system, respectively. All of these data series included in *LEGAL1* are obtained from the ICRG database. In these indexes, higher values indicate better conditions. The data series are available for the period of 1984 through 1997, but are included as the period-average.

[15] Time fixed effects are also included in the model to control for possible time-specific exogenous shocks.
[16] The first eigenvector for *Legal1* was found to be (*Corrupt, LAO,BQ*)' = (0.574, 0.580, 0.578)', indicating that the variability of *LEGAL1* is not merely driven by any particular series.

Before discussing the regression results, we make one observation. Although we use panel data specifications in the following analyses, the data on legal/institutional development are cross-sectional in nature, *i.e.*, they are time-invariant. The relative shortness of the time series of the ICRG variables makes it difficult to include these variables as panel data. As Wei (2000) discusses (on the corruption indices in his paper), these types of institutional variables may entail some possibility of biasness. In order to circumvent this issue, it is reasonable to use the period average. However, the inclusion of these variables as time-invariant factors do not pose a substantial problem for our analysis, since these characteristics represented by the legal/institutional variables are likely to change only very slowly.[17] Moreover, we focus mainly on the effect of financial openness on financial development, but not the effect of legal/institutional development *per se*. In other words, rather than shedding light on how the development of institutions and legal systems affects financial development, we examine how the effect of financial openness changes depending upon the "environment" of institutions and legal systems. Therefore, time-variation of the legal/institutional variables is not critical to our study.

3.3 Empirical Results

The regression results for the model specified in equation (1) are reported in Tables 3-1 and 3-2. We focus on the coefficients of $KAOPEN_{t\text{-}5}$ (first row), the legal variable (second row), and the interactive term between the legal variable and $KAOPEN_{t\text{-}5}$ (third row). For each financial development variable, the regression results are shown for three sample groups: less development countries, Asian countries, and non-Asian less developed countries. Our observations will mainly focus on the regressions with equity market development measures.

Table 3-1 reports the regression results for the models with *LEGAL1*. We can see that in the LDC sample, financial openness ($KAOPEN_{t\text{-}5}$) contributes both directly and in an interactive manner with financial openness to equity market development measured by stock market total values. In the Asian sample, the interactive effect between financial openness and legal development is detected, but not in the non-Asian LDC sample. Significant coefficients for the interactive term are also found in the models with equity market development measured by stock

[17] Stulz (1999) and Stiglitz (2000) argue that financial globalization puts pressure on governments to improve legal systems and infrastructure for financial markets. However, to our knowledge, there is no empirical evidence for the causality. Also, as previously mentioned, the ICRG legal variables are available since 1984, which also creates practical data constraints for us to use time-varying variables for legal and institutional development.

market turnover for both LDC and non-Asian LDC subsamples.

Here, we must be careful about how to interpret the overall effect of capital account openness because it depends on the level of legal development.[18] That is, given equation (1), the total effect of financial openness can be shown as:

$$\text{Total Effect of KA openness}^{i} = \left(\gamma_1 + \gamma_3 \overline{L}\right) KAOPEN_{t-5}^{i},$$

where $\overline{L}$ is the mean of a measure of legal development. For example, when we examine the regression specifications for the financial development measured in stock market total value for LDC group in Table 3-1 (column [7]), the total effect of a one-unit increase in *KAOPEN* is calculated to be –0.0005 using the LDC group's average of *LEGAL1*, –0.74. If we do the same calculation for the Asian group using the coefficients from column [7], the total effect is now 0.0025 because the group's average of *LEGAL1* is higher than LDC's. Thus, depending upon the level of legal and institutional development, opening capital accounts, on average, can lead to a lower or higher rate of development in equity markets.

Table 4 makes this point clear. In this table, row [A] shows the total effect of a one-unit increase in *KAOPEN* calculated using the estimates from the regression model with stock market total value for the LDC group, evaluated at the average values of the legal variable for each of the sample groups: Latin America, non-Asian LDC, LDC, ASIA, EMG, and Asian EMG (shown in row [B]). Row [C] shows the threshold level of the legal variable, above which a one-unit increase in capital account openness has a positive impact on equity market development. The table illustrates that, in order for capital account openness to contribute to the development of equity markets, countries must be possessed of a level of legal/institutional development greater than the threshold level of *LEGAL1* = –0.69. Hence, among the sample groups, the groups of emerging market countries, Asian economies, and Asian emerging market countries (whose average values of *LEGAL1* exceed the –0.69 threshold) will on average benefit from opening their capital accounts. On the other hand, less developed countries, non-Asian LDC, and the Latin American group will hamper their equity market development by opening capital accounts. Especially, the negative effect of financial opening on the Latin American group is significant because of the low

[18] In case of the regressions with *LEGAL1*, the fact that the variable can be negative for a lower value also contributes to the complexity in the interpretation.

level of legal and institutional development, whereas the Asian countries, especially emerging market ones, can develop equity markets by opening their capital accounts.

As specific examples, Peru increased its financial openness from –1.84 to 2.25 between 1990 and 1995. Given its *LEGAL1* level of –1.65, lower than the threshold of –0.69, the increase in financial openness would reduce the growth rate of stock market total value by 4.0% point annually. Thailand, on the other hand, experienced a smaller increase of 1.09 in its *KAOPEN* variable (from 0.15 to 1.24), but because its *LEGAL1* level is 0.386, much higher than the threshold as well as Peru's, its *SMTV* is predicted to *grow* at an additional 1.2% annually. Given that *SMTV* grew at 1.99% annually for less developed countries during the 1990s (Table 1), this acceleration in the growth rate is significant.

Figure 3 presents a visual picture of the total effect of an one-unit increase in *KAOPEN* based on each country's value of *LEGAL1* for Asian and Latin American countries. The countries are placed in the order of the magnitude of the total effect of an one-unit increase in *KAOPEN*. The countries that have positive effects of financial opening are those which attained a threshold level of legal and institutional development such as Malaysia and Korea, whereas countries with underdeveloped institutional infrastructure may hamper equity market development.

Table 3-2 summarizes the results from the regressions that are run with each of the components of *LEGAL1* (i.e., *Corrupt*, *LAO*, and *BQ*) included individually and interactively. For the sake of brevity, the table shows only the coefficients of the financial openness variable, the legal/institutional variable, and the interaction term. For the group of less developed countries in general, across the different models with different measures of financial development, the significance of the estimated coefficients appears to be qualitatively the same as those of the regressions with *LEGAL1*.[19] In the Asian subsample, when financial development is measured by stock market total values, both the level and interactive terms with *KAOPEN* are statistically significant for the models with *Corrupt* and *LAO* (and adjusted R-squares are relatively higher than other subgroups). Bureaucratic quality seems to matter for non-Asian less developed countries, but not for the Asian countries. Interestingly, we can observe that the coefficient of $KAOPEN_{t\text{-}5}$ alone has a negative sign wherever the interactive term has a significant coefficient,

[19] Although the coefficient of *KAOPEN* is negative in most of the cases when it is significant, this is because, unlike *LEGAL1*, all the three legal/institutional variables in these models do not contain any negative values. However, because of the negative coefficients, the argument about the thresholds of legal/institutional variables is valid as was in

suggesting that opening financial markets alone may lead to underdevelopment of equity markets, but it can be avoided only if the countries are equipped with a reasonable level of legal/institutional development.

Table 4, again, helps our interpretation of the overall effect of *KAOPEN* for the models with *SMTV*. Generally, we can surmise that liberalizing capital accounts may lead to development in equity markets only when the measures against corruption or law and order are higher than the threshold levels (52.3 and 54.5, respectively). When we control for the level of bureaucratic quality, financial openness seems to leads to financial development among all subgroups except for Latin America. Column [4] shows that for the Asian subgroup, only the average level of bureaucracy quality is high enough for the countries in this group to reap from financial liberalization while that is not the case with the levels of corruption and law and order. However, as far as Asian emerging market countries are concerned, all of these countries' levels of corruption, law and order, and bureaucracy quality are high enough for them to benefit from financial liberalization. As such, we can conclude that those countries which achieved equity market development through financial liberalization are the ones that are equipped with relatively high levels of legal and institutional infrastructure, which seems to be more prevalent in Asia, especially emerging market Asia. This result is consistent with our observation in the previous section that the Asian region experienced steady growth in both equity markets and financial openness throughout the last three decades.

We repeated this exercise using a different set of legal and institutional variables. The new variables pertain particularly to financial transactions. They are creditor protection (*CREDITOR*), contract enforcement (*ENFORCE*), shareholder protection (*SHRIGHTS*), and the accounting standards (*ACCOUNT*), all of which are obtained from LLSV (1997, 1998). We also constructed a composite index *LEGAL2* which is the first standardized principal component of the four variables, and therefore depicts the overall development of the legal system governing financial transactions. While the regressions using *LEGAL2* as the legal/institutional variable yield qualitatively the same results as those with *LEGAL1*, the results for the models with each of the four LLSV variables included as the legal variable are not as decisive as in the previous cases (not reported).[20] These

the case of *LEGAL1*.

[20] Due to the data availability of the LLSV variables, the subsample for less developed countries is essentially the same as that of emerging market countries. Furthermore, the regression analysis for the Asian or non-Asian LDC

findings suggest that it is the development of general legal systems and institutions, not of those specific to financial transactions, that is crucial for a country to benefit from opening its capital accounts.

Our findings suggest that in order for financial openness to help develop equity markets, the level of legal and institutional development is crucial. The interactive effect between financial openness and legal/institutional development is also found for the Asian subgroup. Furthermore, we also find that it is the relatively higher level of legal and institutional development that allows Asian countries to benefit more from financial liberalization and develop equity markets.

3.4 Reverse Causality?

One may reasonably ask if financial development is what allows countries to implement financial liberalization policy, rather than the reverse. While we have worked with non-overlapping, five-year window panels in order to mitigate problems associated with simultaneity, it may still be worthwhile to investigate, as a robustness check, whether countries need to develop their financial systems before undertaking capital account liberalization. Conversely, if we can show that reverse causality is irrelevant, that will be evidence that countries can develop their financial markets by *exogenously* deciding to open their financial markets.

To explore the above question, we change the specification in equation (1) by exchanging the places of $KAOPEN_{t-5}$ and financial development measures (*PCGDP*, *SMKC*, *SMTV*, and *SMTO*); the left-hand side variable is now the five-year average growth in *KAOPEN* while the independent variables of our focus now becomes the financial development variable and the interactive terms between the legal/institutional variables and the financial development variables. We run regressions specified as follows, using non-overlapping data and including each of the legal/institutional variables:

$$(2)\quad KAOPEN_t^i - KAOPEN_{t-5}^i = \phi_0 + \varphi KAOPEN_{t-5}^i + \phi_1 FD_{t-5}^i + \phi_2 L^i + \phi_3 \left(L^i \times FD_{t-5}^i\right) + X_{t-5}^i \Phi + \nu_t^i \quad .$$

The coefficient of our interest is ϕ_1; A significantly positive ϕ_1 would indicate that the above OLS regression results entail simultaneous causality, i.e., financial development leads to financial openness. The regression results (not reported) show that across different sample groups and

subgroups are not conducted for the same reason.

regressions with different financial development measures as well as legal/institutional variables, the coefficients, ϕ_1's, are mostly statistically insignificant or significantly negative, either of which is against the null hypothesis that financial development leads to financial openness. The significantly negative ϕ_1's are found in the regressions that have the dependent variable of the equity market development measures. One of the possible explanations for the negative ϕ_1 may be that a rapid growth in equity markets, in terms of the size of the markets (*SMKC*) or the liquidity of the markets (*SMTV* or *SMTO*) is sometimes associated with financial crises, and that policy makers lower the degree of financial openness during periods of crisis (Ito, 2004). At the very least, we can conclude that our estimation results are not subject to obvious simultaneity issues (as in Bekaert, et al.,2001).

4. Investigating the Sequence of Liberalization

4.1 Trade and Capital Account Liberalization

So far, we have investigated one of the questions of "what can make financial liberalization successful." The next question is whether trade openness is a precondition for financial opening. This is the optimal sequence question, which has been raised by many, including, most notably, McKinnon (1991). According to McKinnon's hypothesis, it is important for a country to liberalize trade before opening capital accounts. More specifically, a country should first convert all import restrictive measures, including non-tariff barriers to trade, to tariffs. Then, countries can open trade flows by reducing the tariff rates. Opening of cross-border financial transactions, McKinnon argues, is the last step of economic liberalization, and must be implemented only if trade openness is achieved.

Although this hypothesis has been influential, empirical evidence has been mixed. Haggard and Maxfield (1993) shows that trade openness is a precondition for removing capital controls whereas Leblang (1997) does not find any evidence for the influence from trade openness on capital account liberalization. Aizenman and Noy (2004) find that financial openness and trade openness are bidirectional, though financial openness seems to lead to trade openness more than the other way around.

As we previously discussed, the sequencing issue is getting more attention in the Asian region because of the recent rise in the interest in economic, not just financial or goods, integration in the region. Table 5 illustrates that the link between financial and trade openness is stronger in Asia. This table reports the correlations between the index for financial openness, *KAOPEN*, and that for trade openness, *TRADEOPEN*, whose definition will be explained more carefully below, for the full sample period and decades across different sample groups. In this table, the correlation between financial and trade openness is exceptionally high for the Asian group than any other groups. The high correlation also appears to be stable throughout the three decades.

We empirically explore the hypothesis of trade openness being a precondition for financial opening by employing a simple model that accounts for the determinants of financial openness or restrictions. As stated in equation (3), we model financial openness is the function of government budget surplus, international reserves, trade openness, and per capita GDP.[21]

$$(3) \quad KAOPEN_t = \xi_0 + \xi_1 KAOPEN_{t-5} + \xi_2 TRADEOPEN_{t-5} + Z_{t-1|t-5}\Xi + \nu_t \,,$$

where $Z_{t-1|t-5}$ is a vector of macroeconomic control variables, namely, government budget surplus, international reserves, and per capita GDP.[22] The rationale for using these macro variables follows the past literature. Grilli and Milesi-Ferretti (1995) showed that a higher level of restrictions on capital flows is empirically linked to higher rates of inflation, a higher share of seigniorage in total taxes, lower real interest rates, and a higher share of government consumption in GDP. Their finding implies that capital controls appear to have strong fiscal implications, *i.e.*, countries with a less developed tax system tend to implement capital controls as the source of government revenue as well as the remedy to capital flows caused by the inflation-driven distortions in the financial markets. In investigating the empirical determinants of capital controls, Johnson and Tamirisa (1998) find that countries tend to implement capital controls, the more prevalent the balance of

[21] The empirical model also controls for regional differences by regional dummies. In Glick, Guo and Hutchison (2004), an empirical model of capital account liberalization is proposed. Our set of explanatory variables overlaps, but does not match, theirs. In part the difference arises from their more empirically oriented motivation for model selection.

[22] The variable for gross international reserves is a proxy to the balance of payments situation of the countries and is measured by gross international reserves in months of imports. The lower gross reserves in months of imports, the higher prevalence of balance of payments concerns are. The data are extracted from the World Bank's *World Development Indicators*. Others have used international reserves as a ratio to M2 as a proxy to the balance of payments situation. The regression results shown in this paper are qualitatively unchanged if international reserves as a ratio to M2 are used.

payments concerns are, the higher real interest rates and real exchange rates,[23] and the larger the size of the government deficit as a share of GDP. We select two variables – the government budget surplus and international reserves – since they are most commonly argued as the determinants of capital controls.[24] We also include per capita GDP to control for the level of development of the economic system. Since these variables are supposed to control for the general trend of macro variables, they are included as the 5-year average prior to the time period *t* (as shown as (*t*-1|*t*-5) in the regression results table).

With these macro variables, we test whether trade openness is a precondition for financial opening by including a five-year lagged variable for the trade openness measure. Although we used in the previous analyses, *opn*, the sum of exports and imports divided by GDP, as the trade openness variable, we use a different variable to measure openness in trade flows. By construction, the variable *opn* measures the openness in goods transactions in terms of not only economic factors but also regulatory measures such as tariffs and quotas. As such, we use another variable *TRADEOPEN* which is a reciprocal of the weighted average (based on the share of imports and exports in total trade) of duties imposed on both imports and exports. Hence, the higher (or close to 100) *TRADEOPEN* is, the less duties imposed on trade flows in both directions, i.e., the more open trade flows are by regulation.[25] By the nature of construction, we can regard *TRADEOPEN* as the index for *de jure* trade openness whereas *opn* as the index for *de facto* trade openness. Because we are interested in the relationship between trade openness and *KAOPEN* which essentially measures *de jure* openness in cross-border financial transactions, we think using *TRADEOPEN* is more appropriate than using *opn*.[26]

We also test whether the reverse causality, i.e., financial openness leads to trade openness, also holds. To maintain the parsimony of the model, we simply switch the places for *KAOPEN* and

[23] Their theoretical prediction, which contrasts with that of Grilli and Milesi-Ferretti, is that countries use capital controls to pursue inconsistent internal and external balances simultaneously such as the case where outflow controls are implemented to avoid nominal currency deprecation pressures without tightening of monetary conditions. When such a threat of currency crisis arises, the real interest rates or real exchange rates tends to be higher. See Leblang (1997) for more discussions on the determinants of capital controls.

[24] In addition to the above variables, we attempted to include variables that refer to the government engagement in seigniorage, such as the inflation rate or the reserve ratio. However, these measures of seigniorage can cause multicollinearity in regression analysis due to its correlation with the level of government budget surplus, the reverse of which is often the reason for seigniorage. Therefore, we decided not to include seigniorage-related variables in our regression model.

[25] Import and export duties as a ratio to imports and exports, respectively, are available from the World Bank's *WDI*. Note the *TRADEOPEN* variable is included in log form.

TRADEOPEN in equation (3) for the regression analysis. Considering that tariff policy is often motivated by the fiscal conditions of countries, it is reasonable to keep the term for budget balance in the regression equation. However, the variable for international reserves is not retained because it lacks a theoretical motivation.

In order to minimize the possibility of two-way causality, in both types of regressions (trade to financial openness and vice versa), we employ a non-overlapping panel data analysis as we did in previous analyses. While the macro variables are included as the five-year average, both *KAOPEN* and *TRADEOPEN* are included as the initial conditions of each five-year panel. In the empirical analysis, we focus on the coefficient ξ_2 (or the coefficient of the five-year lagged financial openness for the other type of regression) to see if the openness in goods trade can be a precondition for financial opening (or the reversed causality is true).

The first three columns of Table 6 report the results for the regressions on whether trade openness leads to financial openness. While the average budget surplus and GDP per capita enter significantly, but not international reserves, the trade openness variable seems to significantly contribute to the level of financial openness in all sample groups, indicating that the openness in goods transactions is a precondition for financial openness. Interestingly, when the same exercise is repeated for the group of Latin American countries (not reported), the coefficient of the trade openness variable becomes insignificant with a large drop in the *p*-value. [27]

Columns (4) through (6) of Table 6 show the results when we switch the places for *KAOPEN* and *TRADEOPEN* in the regression to see whether the reverse causality also holds. We can see that in all the samples, the financial openness variable does not enter significantly. Hence, we can safely conclude that the more openness in goods transactions can lead to a more openness in capital account, but the reverse causality does not appear to be present.

4.2 Endogeneity and the Sequence of Liberalization

Taking our cue from the results reported above, we implement two stage least squares (2SLS) estimation instrumenting the $KAOPEN_{t-5}$ variable in equation (1) with the initial conditions of financial and trade openness five years prior to the variable (i.e., 10-year lagged), as well as government budget surplus and GDP per capita as the five-year average prior to *t-5* and regional

[26] Note that Aizenman and Noy (2004) use *de facto* measures for both financial and trade openness.
[27] This result is probably due to the region's capital restriction policy during the 1980s.

dummies.[28] If we can detect the effect of financial openness on financial development, we can present evidence that financial opening which is preceded by trade opening leads to financial development in a model where the level of legal/institutional development is controlled for.

The results of applying 2SLS to a model that controls for the general development level of legal systems and institutions (*LEGAL1*) are reported in Table 7. For the model with stock market total value (*SMTV*) of the group of less developed countries, we can see that both the magnitude and the statistical significance of the estimated coefficients for the level *KAOPEN*, *LEGAL1*, and interactive terms increase. For the Asian sample, the interactive term remains significant while the level *KAOPEN* term does not (the *p*-value is 29%).[29] For the *SMKC* models, the level of financial openness becomes significant contributors to equity market development for both the LDC and Asian groups. Given these results, we may conclude that financial opening succeeding trading opening leads to equity market development especially when it takes place in an economy with a reasonably developed legal system, though the sequencing does not seem to be as evident in the Asian sample.

5. Concluding Remarks

We examined the nexus between capital account liberalization and financial development with a focus on the Asian region. A casual examination of summary statistics showed that in recent decades this region has achieved high growth in both equity market development as well as the level of openness toward cross-border financial transactions. Given this observation, we investigated a question which policy makers in the Asian region are contemplating, that is, "what is the 'right way' of implementing liberalization?" Despite its intrinsic interest, there has not been much empirical work aimed at answering this question. This paper addresses that deficiency. Specifically, we examined two issues. First, what kind of institutional settings have made financial liberalization successful in fostering financial, especially equity, market development in Asia as well as other less developed countries? Secondly, we investigated whether there is empirical evidence to support the McKinnon hypothesis on the optimal sequence of liberalization, i.e., trade

[28] The international reserves variable is not included because of its insignificance in the previous analysis. The regional dummies are not included as IVs for the Asia and non-Asian LDC subsamples.
[29] Since the sample size is small for the Asian subsample, we deal with the results for this group as suggestive

openness should precede financial openness.

On the first point, our key empirical results suggest that financial openness *does* contribute to equity market development– measured as activity of the stock market – but only when a threshold level of general development of legal systems and institutions has been attained, a condition which is more prevalent among Asian countries, especially emerging market Asian countries, than among the entire set of developing countries. When we look at the specific effects of legal/institutional development, for less developed countries in general, a higher level of bureaucratic quality and law and order, as well as a lower level of corruption, enhances the effect of financial opening in fostering the development of equity markets. For the Asian set of countries, corruption and law and order appear to matter for equity market development while the quality of bureaucracy does not. Interestingly, finance-specific legal institutions do not seem to fulfill the same role, indicating that the general level of legal development matters more than the level of finance-specific legal/institutional development. These results are robust to accounting for simultaneity, so we conclude that increasing the level of openness in cross-border financial transactions – when a reasonable level of legal and institutional development is achieved – can lead to development in equity markets.

When we examine the McKinnon hypothesis, we find that the opening of goods markets is a precondition for financial opening in less developed sample as well as the Asian subsample. However, the reverse causal link does not hold for any of the sample groups. When the financial openness variable is instrumented with trade openness, the contribution of the general level of legal development still remains significant for the group of less developed countries and with a somewhat lesser degree for the Asian sample. We interpret this finding as evidence that an increase in trade openness is a prolog to financial openness, and thence to financial development.

Our final finding is that the uniquely high level of equity market development in the Asian region can be explained by the policy of financial openness in the presence of a highly developed legal infrastructure as well as trade openness.

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Appendix 1: Country list (108 countries)

Asia (15)

1	513	BGD	Bangladesh [e]
2	924	CHN	China [e]
3	819	FJI	Fiji
4	532	HKG	Hong Kong [e]
5	534	IND	India [e]
6	536	IDN	Indonesia [e]
7	542	KOR	Korea [e]
8	548	MYS	Malaysia [e]
9	558	NPL	Nepal
10	564	PAK	Pakistan [e]
11	853	PNG	Papua New Guinea
12	566	PHL	Philippines [e]
13	576	SGP	Singapore [e]
14	524	LKA	Sri Lanka [e]
15	578	THA	Thailand [e]

Other countries (93)

1	612	DZA	Algeria
2	213	ARG	Argentina [e]
3	193	AUS	Australia [i]
4	122	AUT	Austria [i]
5	313	BHS	Bahamas, The
6	419	BHR	Bahrain, Kingdom of [e]
7	316	BRB	Barbados
8	124	BEL	Belgium [i]
9	339	BLZ	Belize
10	638	BEN	Benin
11	218	BOL	Bolivia
12	616	BWA	Botswana [e]
13	223	BRA	Brazil [e]
14	748	BFA	Burkina Faso
15	618	BDI	Burundi
16	622	CMR	Cameroon
17	156	CAN	Canada [i]
18	626	CAF	Central African Rep.
19	628	TCD	Chad
20	228	CHL	Chile [e]
21	233	COL	Colombia [e]
22	634	COG	Congo, Republic of
23	238	CRI	Costa Rica
24	662	CIV	Cote d'Ivoire [e]
25	423	CYP	Cyprus
26	128	DNK	Denmark [i]
27	243	DOM	Dominican Republic
28	248	ECU	Ecuador [e]
29	469	EGY	Egypt [e]
30	253	SLV	El Salvador
31	172	FIN	Finland [i]
32	132	FRA	France [i]
33	646	GAB	Gabon
34	648	GMB	Gambia, The
35	134	DEU	Germany [i]
36	652	GHA	Ghana [e]
37	174	GRC	Greece [i, e]
38	258	GTM	Guatemala
39	263	HTI	Haiti
40	268	HND	Honduras
41	176	ISL	Iceland [i]
42	429	IRN	Iran, Islamic Rep. of
43	178	IRL	Ireland [i]
44	436	ISR	Israel [e]
45	136	ITA	Italy [i]
46	343	JAM	Jamaica [e]
47	158	JPN	Japan [i]
48	439	JOR	Jordan [e]
49	664	KEN	Kenya [e]
50	443	KWT	Kuwait
51	666	LSO	Lesotho
52	674	MDG	Madagascar
53	676	MWI	Malawi
54	678	MLI	Mali
55	181	MLT	Malta
56	682	MRT	Mauritania
57	684	MUS	Mauritius [e]
58	273	MEX	Mexico [e]
59	686	MAR	Morocco [e]
60	138	NLD	Netherlands [i]
61	196	NZL	New Zealand [i]
62	278	NIC	Nicaragua
63	692	NER	Niger
64	694	NGA	Nigeria [e]
65	142	NOR	Norway [i]
66	449	OMN	Oman [e]
67	283	PAN	Panama
68	288	PRY	Paraguay
69	293	PER	Peru [e]
70	182	PRT	Portugal [i, e]
71	714	RWA	Rwanda
72	456	SAU	Saudi Arabia [e]
73	722	SEN	Senegal
74	718	SYC	Seychelles
75	724	SLE	Sierra Leone
76	199	ZAF	South Africa [e]
77	184	ESP	Spain [i]
78	734	SWZ	Swaziland
79	144	SWE	Sweden [i]
80	146	CHE	Switzerland [i]
81	463	SYR	Syrian Arab Republic
82	738	TZA	Tanzania
83	742	TGO	Togo
84	369	TTO	Trinidad and Tobago [e]
85	744	TUN	Tunisia [e]
86	186	TUR	Turkey [e]
87	746	UGA	Uganda
88	112	GBR	United Kingdom [i]
89	111	USA	United States [i]
90	298	URY	Uruguay
91	299	VEN	Venezuela, Rep. Bol. [e]
92	754	ZMB	Zambia
93	698	ZWE	Zimbabwe [e]

i – industrialized countries (IDC), 22 countries
e – emerging market countries (EMG), 31 countries
(Standard & Poor (2000))

Appendix 2: The "Chinn-Ito" Index

KAOPEN is an index to measure a country's degree of capital account openness. The dataset encompasses the time period of 1970-2000 for 108 countries. For a complete list of the countries, see the attached country list.

Construction of *KAOPEN*

KAOPEN is based on the four binary dummy variables reported in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).* These variables are to provide information on the extent and nature of the restrictions on external accounts for a wide cross-section of countries. These variables are:

- k_1: variable indicating the presence of multiple exchange rates;
- k_2: variable indicating restrictions on current account transactions;
- k_3: variable indicating restrictions on capital account transactions; and
- k_4: variable indicating the requirement of the surrender of export proceeds.

In order to focus on the effect of *financial openness* – rather than *controls* – we reverse the values of these binary variables, such that the variables are equal to one when the capital account restrictions are non-existent. Moreover, for controls on capital transitions (k_3), we use the share of a five-year window (encompassing year *t* and the preceding four years) that capital controls were not in effect ($SHAREk_3$).

$$SHAREk_{3,t} = \left(\frac{k_{3,t} + k_{3,t-1} + k_{3,t-2} + k_{3,t-3} + k_{3,t-4}}{5} \right)$$

Then we construct an index for capital "openness" ($KAOPEN_t$), which is the first standardized principal component of k_{1t}, k_{2t} $SHAREk_3$, k_{4t}. This index takes on higher values the more open the country is to cross-border capital transactions. By construction, the series has a mean of zero. The first eigenvector for *KAOPEN* was found to be ($SHAREk_3, k_1, k_2, k_4$)' = (0.577, 0.270, 0.526, 0.563)', indicating that the variability of *KAOPEN* is not merely driven by the $SHAREk_3$ series.

We incorporate the $k_{1,t}$, $k_{2,t}$, and $k_{4,t}$ variables in our *KAOPEN* variable instead of focusing on k_3 which refers to restrictions on capital account transactions. We believe the incorporation of $k_{1,t}$, $k_{2,t}$, and $k_{4,t}$ in this index allows us to more accurately capture the intensity of the capital controls. This point can be made more concrete by considering a country with an open capital account. It may still restrict the flow of capital by limiting transactions on the current account restrictions or other systems such as multiple exchange rates and requirements to surrender export proceeds. Alternatively, countries that already have closed capital accounts might try to increase the stringency of those controls by imposing k_1, k_2, and k_4 types of restrictions so that the private sector cannot circumvent the capital account restrictions.

Clearly, the measurement of the extent of capital account controls is a difficult enterprise. Many researchers have tried to capture the complexity of real-world capital controls, with varying degrees of success, and varying degrees of coverage. For reviews and comparisons of various measures on capital controls, refer to Edwards (2001), Edison *et al*. (2002) and Eichengreen (2002).

Table 1: Growth rates of *PCGDP*, *SMKC*, *SMTV*, and *SMTO* 1970 – 2000 and decades

	Growth rates of			
	Private Credit Creation (PCGDP)	***Stock Market Capitalization (SMKC)***	***Stock Market Total Value (SMTV)***	***Stock Market Turnover (SMTO)***
	1970 – 2000			
Full	0.87%	1.93%	1.87%	2.47%
IDC	1.74%	2.96%	3.67%	3.45%
LDC	0.61%	1.32%	0.84%	1.87%
EMG	0.91%	1.49%	1.09%	2.49%
Asia	1.11%	1.67%	1.86%	3.89%
Non-Asian LDC	0.43%	1.15%	0.40%	0.94%
Latin America	0.48%	1.16%	0.08%	-0.03%
	1970 – 1979			
Full	0.62%	0.47%	0.18%	0.35%
IDC	0.77%	–0.22%	0.25%	-0.35%
LDC	0.57%	1.70%	0.11%	1.85%
EMG	0.70%	1.29%	0.09%	1.55%
Asia	0.78%	1.14%	-0.02%	0.40%
Non-Asian LDC	0.52%	2.52%	0.21%	4.10%
Latin America	0.48%	0.64%	0.15%	7.17%
	1980 – 1989			
Full	0.68%	1.52%	1.33%	1.98%
IDC	1.99%	2.89%	2.25%	3.61%
LDC	0.30%	0.53%	0.70%	0.78%
EMG	0.49%	0.70%	0.82%	1.16%
Asia	1.06%	0.61%	1.79%	1.98%
Non-Asian LDC	0.14%	0.48%	0.14%	0.08%
Latin America	–0.01%	0.21%	0.07%	0.05%
	1990 – 2000			
Full	1.08%	3.33%	3.72%	3.81%
IDC	1.95%	5.59%	7.51%	4.40%
LDC	0.85%	2.27%	1.99%	3.53%
EMG	1.35%	2.66%	3.00%	5.14%
Asia	1.46%	3.50%	5.07%	9.84%
Non-Asian LDC	0.71%	1.78%	0.84%	1.05%
Latin America	1.30%	1.80%	0.16%	–0.05%
	1995 – 2000			
Full	1.58%	3.03%	4.81%	5.08%
IDC	3.10%	9.50%	12.06%	6.52%
LDC	1.19%	0.25%	1.66%	4.45%
EMG	1.78%	–0.39%	2.83%	7.30%
Asia	1.81%	–1.78%	3.95%	15.04%
Non-Asian LDC	1.05%	0.99%	0.85%	0.62%
Latin America	1.59%	0.75%	–0.33%	–1.06%

Notes: For the data description, refer to the text. The original data are extracted from the updated version of the Beck, Demirgüc-Kunt, and Levine (2000) dataset.

Tale 2: Averages of *KAOPEN* and change in *KAOPEN*, 1970 – 2000 and decades

	Averages of *KAOPEN*				
	1970 – 2000	*1970s*	*1980s*	*1990s*	*1995 – 2000*
Full	0.000	–0.288	–0.306	0.501	0.719
IDC	1.121	0.247	0.791	2.160	2.438
LDC	–0.287	–0.433	–0.579	0.087	0.282
EMG	–0.252	–0.555	–0.582	0.298	0.608
Asia	0.008	–0.384	–0.022	0.365	0.373
Non-Asia LDC	–0.349	–0.443	–0.697	0.033	0.272
Latin America	–0.087	0.065	-0.786	0.412	0.883
	Averages of Change in *KAOPEN*				
	1970 – 2000	*1970s*	*1980s*	*1990s*	*1995 – 2000*
Full	0.033	0.016	–0.004	0.078	–0.025
IDC	0.077	0.041	0.061	0.118	0.000
LDC	0.022	0.009	–0.020	0.068	–0.031
EMG	0.046	0.034	–0.028	0.119	0.039
Asia	0.025	0.064	0.004	0.016	–0.101
Non-Asia LDC	0.021	–0.002	–0.025	0.079	–0.016
Latin America	0.032	–0.001	–0.096	0.167	0.075

Notes: *KAOPEN* is an index for the openness in capital account transactions and is the first standardized principal component of *SHAREk3*, *k1*, *k2*, and *k4*. k_1 indicates the presence of multiple exchange rates; k_2 indicates restrictions on current account transactions; k_3 indicates restrictions on capital account transactions; and $k_4$indicates the requirement of the surrender of export proceeds. In order to focus on the effect of *financial openness* – rather than *controls* – we reverse the values of these binary variables, such that the variables are equal to one when the capital account restrictions are non-existent. The first eigenvector for *KAOPEN* was found to be ($SHAREk_3$, k_1, k_2, k_4)' = (0.577, 0.270, 0.526, 0.563)', indicating that the variability of *KAOPEN* is not merely driven by the $SHAREk_3$ series. The average of *KAOPEN* across countries over the full time period is zero by construction. See Appendix 2 for more details.

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Table 3-1: Financial Development, Financial Openness, and Legal/Institutional Development
(*LEGAL1*: General Legal/Institutional Development)
LDC, ASIA, and non-Asian LDC: Five year panels, 1980-2000

	Pred. sign	Private Credit			Stock Market Capitalization			Stock Market Total Value			Stock Market Turnover		
		LDC [1]	**Asia [2]**	**Non-Asia [3]**	**LDC [4]**	**Asia [5]**	**Non-Asia [6]**	**LDC [7]**	**Asia [8]**	**Non-Asia [9]**	**LDC [10]**	**Asia [11]**	**Non-Asia [12]**
Legal/Inst. Variable: *LEGAL1*													
Financial Openness [t-5]	(+)	0.0005 [0.0013]	-0.0014 [0.0031]	-0.0004 [0.0015]	0.0049 [0.0078]	0.0306 [0.0285]	-0.0091 [0.0055]	0.0071 [0.0042]*	0.0074 [0.0140]	0.0053 [0.0034]	0.0096 [0.0123]	-0.0007 [0.0444]	0.0184 [0.0124]
LEVEL: *LEGAL1*	(+)	0.0011 [0.0014]	0.0071 [0.0053]	-0.0007 [0.0015]	0.0126 [0.0081]	0.0189 [0.0158]	0.0084 [0.0093]	0.0092 [0.0053]*	0.013 [0.0142]	0.0071 [0.0049]	0.0048 [0.0186]	0.0407 [0.0521]	0.0129 [0.0090]
INTERACTION: *LEGAL1*x Fin. Open. [t-5]	(+)	-0.0009 [0.0010]	-0.0013 [0.0028]	-0.0013 [0.0011]	0.0037 [0.0043]	0.0161 [0.0135]	-0.0044 [0.0061]	0.0103 [0.0035]***	0.0156 [0.0084]*	0.0073 [0.0044]	0.0213 [0.0109]*	0.0314 [0.0350]	0.0087 [0.0049]*
Financial Deepening [t-5]	(–)	0.0001 [0.0119]	-0.0149 [0.0242]	-0.0047 [0.0136]	-0.0493 [0.0380]	-0.0501 [0.0722]	-0.0491 [0.0278]*	0.0795 [0.1187]	-0.1549 [0.1198]	0.119 [0.1585]	-0.0033 [0.0536]	-0.1436 [0.2076]	-0.0786 [0.0271]***
Per Capita Income [t-5]	(+)	0.0031 [0.0015]**	0.0089 [0.0098]	0.0042 [0.0014]***	0.0188 [0.0126]	0.0039 [0.0348]	0.0262 [0.0156]*	0.0128 [0.0123]	0.0791 [0.0516]	0.0091 [0.0122]	-0.0023 [0.0273]	0.0159 [0.0959]	0.0011 [0.0116]
Inflation [t-5]	(–)	-0.0047 [0.0074]	-0.0195 [0.0452]	-0.0013 [0.0075]	-0.0498 [0.0303]	0.2243 [0.2799]	-0.0496 [0.0288]*	-0.0221 [0.0316]	-0.0286 [0.2143]	0.0079 [0.0182]	-0.0815 [0.1166]	0.1528 [0.4641]	0.1093 [0.0767]
Trade Openness [t-5]	(+)	0.0000 [0.0000]	0 [0.0001]	0.0001 [0.0000]	0.0001 [0.0001]	-0.0002 [0.0004]	0.0002 [0.0002]	-0.0003 [0.0002]*	-0.0005 [0.0003]	0 [0.0001]	-0.0006 [0.0003]*	-0.0014 [0.0011]	-0.0003 [0.0002]
N		289	57	232	101	37	64	115	40	75	98	36	62
Adj. R-sq.		0.09	0	0.1	0.2	0.15	0.15	0.16	0.23	0.11	-0.01	0.12	0.05

Notes: Point estimates from OLS, heteroskedasticity robust standard errors in parentheses. Dependent variable is the average annual growth rate over a five year period. Financial openness is measured by the Chinn-Ito index (*KAOPEN*). Regressions include fixed time effects (estimates not reported). Observations of inflation rates in excess of 100% are dropped from the sample. (*)[**]{***} indicates marginal significance at the (10%)[5%]{1%} level.

Table 3-2: Financial Development, Financial Openness, and Legal/Institutional Development
(Components of LEGAL1: Corruption, Law and Order, and Bureaucracy Quality)
LDC, ASIA, and non-Asian LDC: Five year panels, 1980-2000

		Private Credit			**Stock Market Capitalization**			**Stock Market Total Value**			**Stock Market Turnover**		
	Pred sign	**LDC [1]**	**Asia [2]**	**Non-Asia [3]**	**LDC [4]**	**Asia [5]**	**Non-Asia [6]**	**LDC [7]**	**Asia [8]**	**Non-Asia [9]**	**LDC [10]**	**Asia [11]**	**Non-Asia [12]**
Legal/Inst. Variable: Corruption (*CORRUPT)*													
Financial Openness [t-5]	(+)	0.0009	0.005	0.0008	-0.0112	-0.0386	0.0122	-0.0314	-0.0499	-0.0272	-0.0613	-0.0981	-0.0197
		[0.0038]	[0.0118]	[0.0036]	[0.0134]	[0.0272]	[0.0212]	[0.0110]***	[0.0231]**	[0.0152]*	[0.0410]	[0.1069]	[0.0146]
LEVEL: *CORRUPT*	(+)	0.0000	0.0005	0	0.0014	0.0016	0.0006	0.0004	0.0005	0.0006	-0.0011	-0.0011	0.0005
		[0.0001]	[0.0004]	[0.0001]	[0.0007]**	[0.0012]	[0.0008]	[0.0004]	[0.0011]	[0.0004]	[0.0011]	[0.0041]	[0.0004]
INTERACTION:	(+)	0.0000	-0.0001	0	0.0003	0.0013	-0.0004	0.0006	0.0009	0.0005	0.0010	0.0012	0.0006
Corrupt x Fin. Opn. [t-5]		[0.0001]	[0.0002]	[0.0001]	[0.0003]	[0.0008]	[0.0004]	[0.0002]***	[0.0005]*	[0.0003]*	[0.0006]*	[0.0024]	[0.0002]**
N		289	57	232	101	37	64	115	40	75	98	36	62
Adj. R-sq.		0.09	-0.01	0.1	0.23	0.26	0.16	0.16	0.23	0.12	-0.01	0.08	0.05
Legal/Inst. Variable: Law and order (*LAO*)													
Financial Openness [t-5]	(+)	0.004	0.0017	0.0046	-0.0217	-0.0377	-0.0033	-0.0218	-0.0751	-0.0014	-0.0629	-0.2176	0.0081
		[0.0029]	[0.0065]	[0.0033]	[0.0126]*	[0.0356]	[0.0159]	[0.0119]*	[0.0286]**	[0.0082]	[0.0445]	[0.1283]	[0.0154]
LEVEL: *LAO*	(+)	0.0001	0.0005	0	0.0004	0.0012	-0.0001	0.0003	0.0006	0	0.0005	0.0009	0.0002
		[0.0001]	[0.0003]**	[0.0001]	[0.0004]	[0.0010]	[0.0004]	[0.0003]	[0.0011]	[0.0002]	[0.0009]	[0.0045]	[0.0005]
INTERACTION:	(+)	-0.0001	-0.0001	-0.0001	0.0004	0.0009	-0.0001	0.0004	0.0013	0	0.0011	0.0036	0
LAO x Fin. Opn. [t-5]		[0.0001]	[0.0001]	[0.0001]	[0.0003]	[0.0008]	[0.0003]	[0.0002]*	[0.0006]**	[0.0002]	[0.0007]	[0.0025]	[0.0003]
N		289	57	232	101	37	64	115	40	75	98	36	62
Adj. R-sq.		0.09	0.02	0.1	0.2	0.14	0.13	0.12	0.24	0.02	-0.02	0.16	0.02
Legal/Inst. Variable: Bureaucracy Quality (*BQ*)													
Financial Openness [t-5]	(+)	0.0048	0.0011	0.0062	0.0057	0.0097	0.0026	-0.0269	-0.0261	-0.0218	-0.0564	-0.065	-0.0147
		[0.0032]	[0.0125]	[0.0033]*	[0.0107]	[0.0196]	[0.0177]	[0.0129]**	[0.0301]	[0.0123]*	[0.0334]*	[0.0828]	[0.0153]
LEVEL: *BQ*	(+)	0.0001	0.0001	0	0.0003	-0.0002	0.0006	0.0007	0.0003	0.0007	0.0014	0.0032	0.0011
		[0.0001]	[0.0002]	[0.0001]	[0.0005]	[0.0006]	[0.0008]	[0.0004]*	[0.0008]	[0.0004]*	[0.0010]	[0.0024]	[0.0006]*
INTERACTION:	(+)	-0.0001	0	-0.0001	-0.0001	-0.0002	-0.0001	0.0006	0.0003	0.0005	0.0011	0.0008	0.0006
BQ x Fin. Opn. [t-5]		[0.0001]	[0.0002]	[0.0001]*	[0.0002]	[0.0006]	[0.0003]	[0.0003]**	[0.0008]	[0.0002]*	[0.0006]**	[0.0021]	[0.0003]**
N		289	57	232	101	37	64	115	40	75	98	36	62
Adj. R-sq.		0.1	-0.06	0.12	0.18	0.07	0.15	0.17	0.15	0.19	0	0.12	0.09

Notes: Point estimates from OLS, heteroskedasticity robust standard errors in parentheses. Dependent variable is the average annual growth rate over a five year period. Financial openness is measured by the Chinn-Ito index (*KAOPEN*). Regressions include fixed time effects (estimates not reported). Observations of inflation rates in excess of 100% are dropped from the sample. (*)[**]{***} indicates marginal significance at the (10%)[5%]{1%} level.

Table 4: Difference among different samples in terms of the Total effect of a one-unit increase in KAOPEN when the dependent variable is SMTV

		Latin America [1]	non-Asia LDC [2]	LDC [3]	ASIA [4]	EMG [5]	Asian EMG [6]
[A]	Total effect of KA Openness	–0.0039	–0.0011	–0.0005	0.0025	0.0042	0.0044
[B]	$\overline{L}$ (*Legal1*)	–1.07	–0.80	–0.74	–0.45	–0.28	–0.26
[C]	Threshold level of *Legal1*	–0.69					
[A]	Total effect of KA Openness	–0.0038	–0.0020	–0.0018	–0.0012	0.0014	0.0007
[B]	$\overline{L}$ (*Corrupt*)	45.95	49.04	49.27	50.32	54.73	53.54
[C]	Threshold level of *Corrupt*	52.3					
[A]	Total effect of KA Openness	–0.0027	–0.0018	–0.0015	0.0000	0.0005	0.0009
[B]	$\overline{L}$ (*Law and Order*)	47.85	50.05	50.85	54.49	55.76	56.68
[C]	Threshold level of *LAO*	54.5					
[A]	Total effect of KA Openness	–0.0019	0.0013	0.0023	0.0066	0.007	0.0078
[B]	$\overline{L}$ (*Bureaucracy Quality*)	41.61	47.07	48.66	55.87	56.44	57.91
[C]	Threshold level of *BQ*	44.8					

Notes: "Total Effect" [A] indicates the total effect of a one-unit increase in *KAOPEN* when the legal/institutional variable takes the value of the average in the subsample group ($\overline{L}$, shown in [B]). The estimation model is based on equation (1) using the data of the LDC subgroup for the regressions with legal variables. Rows [C] show the threshold level of the legal variable above which the capital account openness has a positive impact on financial development.

Table 5: Correlations between Financial Openness (*KAOPEN*) and Trade Openness (*TRADEOPEN*) among different sample groups and decades

	Correlations between Financial and Trade Openness			
	1970 – 2000	*1970s*	*1980s*	*1990s*
Full	0.49	0.37	0.44	0.56
IDC	0.37	0.24	0.23	0.20
LDC	0.38	0.29	0.34	0.41
EMG	0.38	0.35	0.27	0.42
Asia	0.61	0.52	0.62	0.58
Non-Asia LDC	0.31	0.26	0.26	0.35
Latin America	0.28	0.11	0.17	0.43

Table 6: Determinants of Capital Account and Trade Openness

LDC, ASIA, and non-Asian LDC: Five year panels, 1980-2000

Dependent Variable:		Financial Openness (*t*)			Trade Openness (*t*)		
	Pred. Sign	(1) LDC	(2) Asia	(3) Non-Asian LDC	(4) LDC	(5) Asia	(6) Non-Asian LDC
Financial Openness (*t*-5)	+	0.5582 [0.0788]***	0.5457 [0.1346]***	0.5736 [0.0998]***	0.0019 [0.0022]	0.0026 [0.0030]	0.0001 [0.0025]
Trade Openness (*t*-5)	+	2.0171 [1.0772]*[6%]	3.7723 [2.2915]*	2.4840 [1.4126]*	0.5633 [0.0857]***	0.7828 [0.1310]***	0.5001 [0.1032]***
Avg. Budget Surplus (*t*-1|*t*-5)	+	0.0534 [0.0180]***	-0.0674 [0.0375]*	0.0722 [0.0196]***	0.0002 [0.0007]	-0.0008 [0.0014]	-0.0002 [0.0007]
Avg. Total reserves (*t*-1|*t*-5)	+	0.0022 [0.0309]	0.0737 [0.0683]	-0.0111 [0.0350]			
Avg. GDP per capita (*t*-1|*t*-5)	+	0.2157 [0.1169]*	0.6603 [0.2314]***	0.0967 [0.1392]	0.0196 [0.0047]***	0.0106 [0.0081]	0.0196 [0.0058]***
Number of Observations		184	52	129	151	44	107
Adjusted R^2		0.44	0.67	0.35	0.63	0.79	0.58

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Budget surplus, total reserves, and GDP per capita are included at the average over t-1 through t-5. Constant and regional fix effects (time fixed effects for the Asian sample) are also included in the regression, but their estimated coefficients are not reported. The regression estimations are conducted in non-overlapping manners with the observations excepted for 1980, 1985, 1990, 1995, and 2000 excluded.

Table 7: Two-Stage Least Squares Analysis
Instrumented by per capita output, budget balance, and trade openness ¶
***LEGAL1* (General Legal/Institutional Development)**
LDC, ASIA, and non-Asian LDC: Five year panels, 1980-2000

		Private Credit			**Stock Market Capitalization**			**Stock Market Total Value**			**Stock Market Turnover**		
	Pred. sign	**LDC [1]**	**Asia [2]**	**Non-Asia [3]**	**LDC [4]**	**Asia [5]**	**Non-Asia [6]**	**LDC [7]**	**Asia [8]**	**Non-Asia [9]**	**LDC [10]**	**Asia [11]**	**Non-Asia [12]**
Legal/Inst. Variable: *LEGAL1*													
Financial Openness [t-5]	(+)	0	-0.0063	0.0011	0.0187	0.0290	0.0383	0.0212	0.0133	0.0162	0.0081	-0.0456	-0.0046
		[0.0033]	[0.0080]	[0.0063]	[0.0094]*	[0.0109]**	[0.0286]	[0.0076]***	[0.0124]	[0.0160]	[0.0126]	[0.0532]	[0.0219]
LEVEL: *LEGAL1*	(+)	0.0006	0.011	-0.002	0.0265	0.0193	0.0367	0.0117	0.0273	0.016	-0.0182	0.0018	0.0046
		[0.0025]	[0.0086]	[0.0027]	[0.0092]***	[0.0134]	[0.0245]	[0.0058]**	[0.0108]**	[0.0138]	[0.0251]	[0.0749]	[0.0122]
INTERACT.: *LEGAL1*x Fin. Open. [t-5]	(+)	-0.0003	-0.0022	-0.0006	0.0044	0.0104	0.0129	0.0113	0.0104	0.0123	0.0233	0.0205	0.0011
		[0.0015]	[0.0037]	[0.0033]	[0.0051]	[0.0063]	[0.0167]	[0.0037]***	[0.0045]**	[0.0089]	[0.0143]	[0.0364]	[0.0121]
Financial Deepening [t-5]	(–)	0.0257	0.0132	0.025	-0.0805	-0.1052	-0.0493	-0.1184	-0.2433	0.1171	-0.0197	-0.0688	-0.0845
		[0.0162]	[0.0524]	[0.0135]*	[0.0327]**	[0.0258]***	[0.0596]	[0.0776]	[0.0714]***	[0.1869]	[0.0582]	[0.2722]	[0.0285]***
Inflation [t-5]	(–)	-0.005	-0.0688	-0.0845	-0.0509	-0.0688	-0.0845	0.0196	-0.0688	-0.0845	-0.0025	-0.0688	-0.0845
		[0.0102]	[0.2722]	[0.0285]***	[0.0293]*	[0.2722]	[0.0285]***	[0.0319]	[0.2722]	[0.0285]***	[0.1243]	[0.2722]	[0.0285]***
N		117	35	82	77	31	46	83	32	51	75	30	45
R-sq.		0.17	0.27	0.2	0.29	0.55		0.04	0.25	0.27	0.1	0.38	0.17

Notes: Point estimates from OLS, heteroskedasticity robust standard errors in parentheses. Dependent variable is the average annual growth rate over a five year period. Financial openness is measured by the Chinn-Ito index (*KAOPEN*). Regressions include fixed time effects (estimates not reported). Observations of inflation rates in excess of 100% are dropped from the sample. (*)[**]{***} indicates marginal significance at the (10%)[5%]{1%} level.

¶ - The variable for financial openness lagged five years ($KAOPEN_{t-5}$) is instrumented by per capita output and budget balance, both of which are included as the average over the five years prior to five years before each window (i.e., t-10 through t-6 since the IV is already lagged five years), regional dummies, and the level of financial openness and trade openness, both of which are lagged ten years.

Figure 1: Financial Development by Subgroup

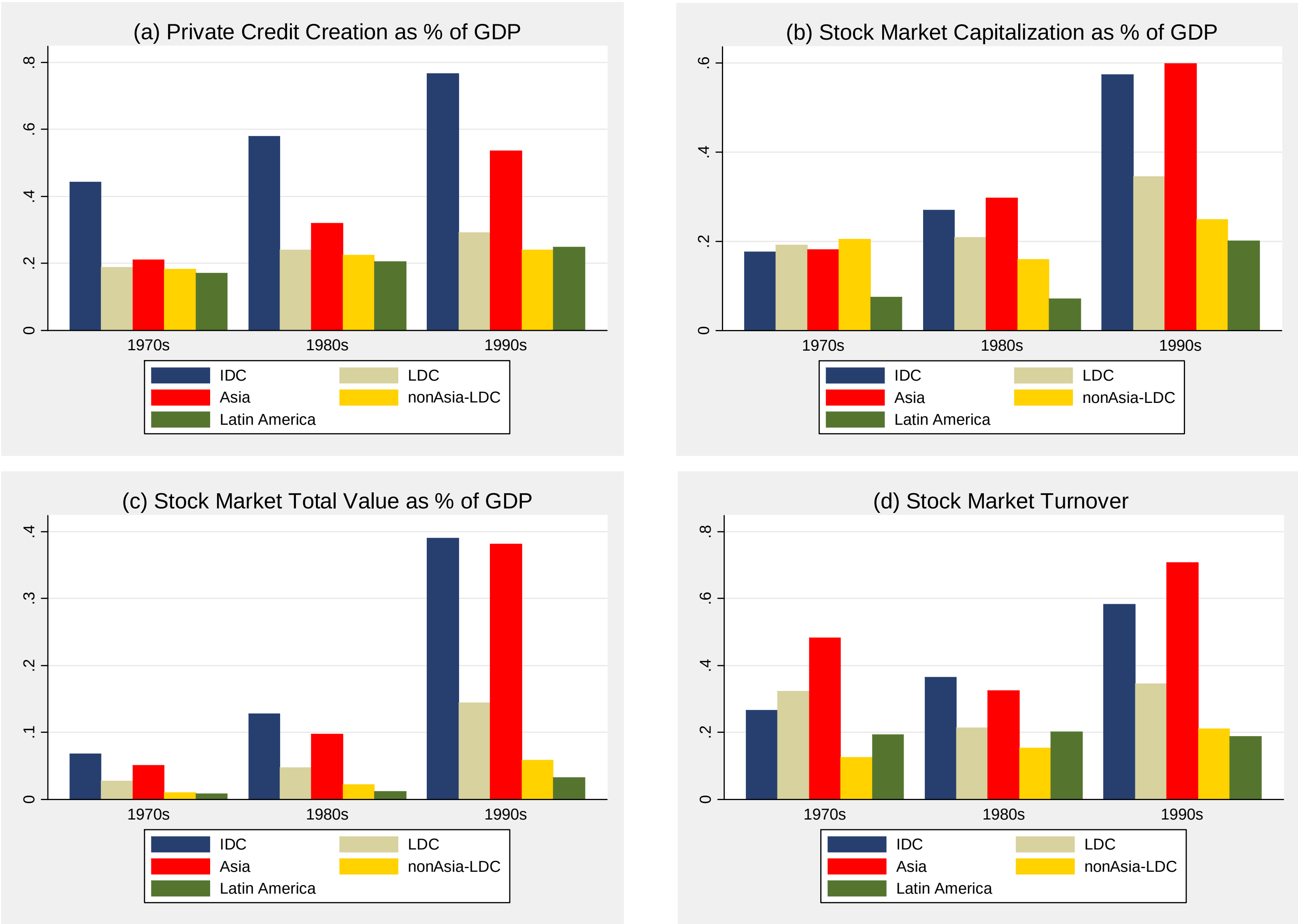

Figure 2: Development of Capital Account Openness, 1970 – 2000: ASIA, non-Asian LDC, Latin America

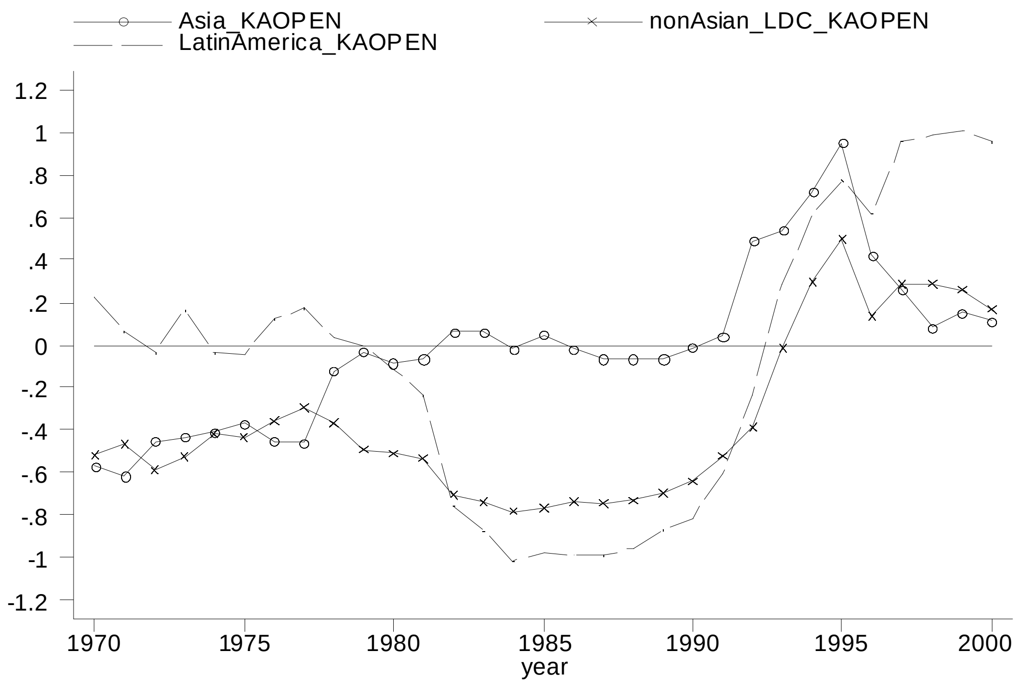

Figure 3: Total Effect of an One-unit Increase in Capital Account Openness (KAOPEN) on Equity Market Development (SMTV)