ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Ito, Hiro; Chinn, Menzie

Working Paper

East Asia and global imbalances: Saving, investment, and financial development

Working Paper, No. 07-11

Provided in Cooperation with:
University of California Santa Cruz, Santa Cruz Institute for International Economics (SCIIE)

Suggested Citation: Ito, Hiro; Chinn, Menzie (2007) : East Asia and global imbalances: Saving, investment, and financial development, Working Paper, No. 07-11, University of California, Santa Cruz Institute for International Economics (SCIIE), Santa Cruz, CA

This Version is available at:
https://hdl.handle.net/10419/64111

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

SCCIE WORKING PAPER #07-11
Santa Cruz Center for International Economics
http://sccie.ucsc.edu/

East Asia and Global Imbalances: Saving, Investment, and Financial Development

by
Hiro Ito*
Portland State University
and
Menzie Chinn**
University of Wisconsin and NBER
August 14, 2007

Abstract

We investigate the role of budget balances, financial development and openness, in the evolution of global imbalances. Financial development – or the lack thereof – has received considerable attention as a possible contributing factor to the development of persistent and expanding current account imbalances. Several observers have argued that the depth and sophistication of US capital markets have caused capital to flow from relatively underdeveloped East Asian financial markets. In this paper, we extend our previous work by examining the effect of different types and aspects of financial development. Our cross-country analysis, encompassing a sample of 19 industrialized countries and 70 developing countries for the period of 1986 through 2005, yields a number of new results. First, we confirm a role for budget balances in industrial countries when bond markets are incorporated. Second, empirically both credit to the private sector and stock market capitalization appear to be equally important determinants of current account behavior. Third, while increases in the size of financial markets induce a decline in the current account balance in industrial countries, the reverse is more often the case for developing countries, especially when other measures of financial development are included. However, because of nonlinearities incorporated into the specifications, this characterization is conditional upon other factors. Fourth, a greater degree of financial openness is typically associated with a smaller current account balance in developing countries.

JEL Classification Nos.: F32, F41

Keywords: Current account; net foreign assets; saving glut; investment drought; panel regressions; capital controls, institutional development.

Acknowledgements: Paper prepared for the 18th Annual NBER-East Asian Seminar on Economics, "Financial Sector Development in the Pacific Rim," Singapore Management University, on June 22-24, 2007, organized by Takatoshi Ito and Andy Rose. We thank the discussants, Edwin Lai and Edward Robinson, and the conference participants, for their comments. The financial support of faculty research funds of the University of Wisconsin, Madison and Portland State University is gratefully acknowledged.

*Ito: Department of Economics, Portland State University, 1721 SW Broadway, Portland, OR 97201. Tel/Fax: +1-503-725-3930/3945. Email: ito@pdx.edu

** Chinn: Robert M. La Follette School of Public Affairs; and Department of Economics, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706. Email: mchinn@lafollette.wisc.edu

1. Introduction

The implications of persistent and widening global current account imbalances have been at the center of policy debates over the last half decade. While the concerns subside each year, as a rapid unraveling of the imbalances fails to materialize, the intellectual challenge of determining what drives these imbalances remains. To the extent that some policymakers view the configuration of imbalances to be undesirable, a salient question remains what policies would cause those imbalances shrink.

These imbalances are large. The U.S. deficit was 6.5% of GDP, while China's surplus was 9.1%, with balances in the next two years projected at 10%. The rest of the Developing Asian region is running an average current account surplus of 5.4%.[1] Finally, the sustained elevation in oil prices has added oil exporters to the list of surplus countries. Figure 1 highlights the lopsided nature of imbalances, with the U.S. deficit primarily financed by East Asia and the Middle East.

As a consequence of the magnitude of their surpluses, China and other Asian emerging market countries have often been identified as the main causes of the widening U.S. current account deficits. More specifically, these economies' underdeveloped and closed financial markets are alleged to be insufficiently attractive enough to absorb the excess saving in the region, resulting in a "saving glut". Clarida (2005a,b) argues that East Asian, particularly Chinese, financial markets are less sophisticated, deep, and open so that Asian excess saving inevitably flows into the highly developed U.S. financial market. Bernanke (2005) contends that "some of the key reasons for the large U.S. current account deficit are external to the United States" and remediable only in the long run. That is, it is the saving glut of the Asian emerging

[1] Figures from IMF, *World Economic Outlook* (April 2007).

market countries, driven by rising savings and collapsing investment in the aftermath of the financial crisis, that is the direct cause of the U.S. current account deficit. Therefore, the long term solution is to encourage developing countries, especially those in the East Asian region, to develop financial markets so that the saving rate would fall. Once policies improving institutions and legal systems amenable to financial development and liberalizing the markets are implemented, "a greater share of global saving can be redirected away from the United States and toward the developing nations."

Standing in stark contrast to the saving glut thesis is the more parochial view that a fall in the U.S. national saving, most notably in the form of its government budget deficit, is the main cause of the ongoing current account deficits – the "twin deficit" argument. While the twin deficit effect has been empirically investigated in the literature (e.g., Gale and Orszag, 2004), as far as we are aware, very little investigation has been made to shed light on the effect of financial development on current account balances, with the exception of Chinn and Ito (2007a).[2] In this investigation encompassing a sample of 89 countries over the 1971-2004 period, we found that more financial development leads to *higher* saving for countries with underdevelopment institutions and closed financial markets that includes most of East Asian emerging market countries.[3]

This paper takes a closer look at the effect of financial development on current account balances and the saving-investment determination. Financial development cannot be defined and measured simply (see Beck et al., 2001). Chinn and Ito (2007b) used private credit creation (as a

[2] Theoretical explanations for this phenomenon now abound. See Caballero, Farhi and Gourinchas (2006) and Mendoza et al. (2006).

[3] Among East Asian countries, most of countries (except for Hong Kong and Singapore) could experience worsening current account balances if financial markets develop further, but that effect is achieved, not through a reduction in savings rates, but through higher increases in the levels of investment than those of national savings.

ratio to GDP) as a shorthand proxy measure for financial development. Clearly this is a simplification with implications that should be investigated. Hence, in this paper, we undertake a closer look at the effect of different *types* of financial development – whether banking, equity, bond, or insurance market sector – to gain different insights. Additionally, we investigate various dimensions of financial development, such as size, degree of activity, and efficiency. Given the ongoing asset market booms in China and other emerging market countries in East Asia, size measures alone might lead to misleading inferences.

Other factors are suggested by the current debate. Bernanke argues that the *openness* of financial markets can also affect the direction of cross-border capital flows. Alfaro et al. (2003), on the other hand, show that institutional development may explain the Lucas paradox, i.e., why capital flows from developing countries with presumably high marginal products of capital to developed countries with low ones. In short, financial development might be mediated by financial openness and institutional development. Hence, we will examine interaction effects as well.

Our empirical analysis relies upon a dataset composed of 19 industrialized countries and 70 developing countries for the period of 1986 through 2005. Financial development is assessed from various perspectives: different types of financial markets such as banking, equity, and bond markets, as well as different aspects of financial development such as the size, activeness, and cost performance of the industry. The analysis involves making one key trade-off: in refining the measures of financial development, we reduce the set of countries covered, as well as the time sample. We believe that the payoff to making this trade-off is on net positive.

To anticipate our findings, we find the following. First, we confirm a role for budget balances in industrial countries when bond markets are incorporated. Second, empirically both

credit to the private sector and stock market capitalization appear to be equally important determinants of current account behavior. Third, while increases in the size of financial markets induce a decline in the current account balance in industrial countries, the reverse is more often the case for developing countries, especially when other measures of financial development are included. However, because of nonlinearities incorporated into the specifications, this characterization is contingent. Fourth, a greater degree of financial openness is typically associated with a smaller current account balance in developing countries.

The paper is organized as follows. Section 2 recaps the debate over financial development, openness and institutions, and how those factors are related to the current pattern of current account imbalances, and saving and investment flows. Section 3 details the empirical methodology and results. Section 4 draws out the policy implications; Section 5 concludes.

2. Financial and Institutional Development and the Global Saving Glut

2.1. Theoretical Perspectives

We adopt a medium run prospect approach to evaluate current account behavior. Specifically, we view the current account as being driven by saving and investment behavior. Consequently, factors that affect either of these two flows – such as demographics, trend income growth, terms of trade volatility – should in principal affect the current account. The resulting empirical approach was implemented in Chinn and Prasad (2003).

The proposition that financial development or deepening influences saving and investment behavior is by now well established. Financial development could enhance both saving and investment by raising returns as well as lowering the cost of capital and the risk of

investment. The mitigation of information asymmetries, the reduction of information and transaction costs, the improvement of corporate governance, and/or facilitation of risk management are all potential channels highlighted in the literature.[4]

However, while the effect of financial development on investment is relatively unambiguous (i.e., positive), that on saving is not, since higher returns and lower risk of financial investment create effects on saving akin to income and substitution effects. The traditional view on the effect of financial development on saving (such as Edwards, 1996) suggests a positive association between the two variables; further financial deepening could induce more saving through more depth and sophistication of the financial system. A contrasting view suggests that more developed financial markets lessen the need for precautionary saving, and thereby lower the saving rate. This last observation is the basis for the saving glut thesis, leading to Bernanke's (2005) argument for greater financial development and liberalization as a long run remedy to the global saving glut.[5]

Financial liberalization takes a central role in Kose et al. (2006). Liberalization can bring about more efficient allocation of capital across countries. Another key aspect of financial opening is that financial liberalization directly affects international risk sharing. In an idealized world with complete financial markets (and only tradable goods), the location of investment should be independent of saving, in order to ensure state independent consumption-smoothing (Obstfeld and Rogoff, 1996). However, as Feldstein and Horioka (1980) originally pointed out,

---

[4] See King and Levine (1993), Rajan and Zingales (1998), and Wurgler (2000). This is the basis for the argument that financial development leads to economic growth. Levine (2005) provides an extensive review on the "finance-growth link. "

[5] If one views the effect of financial development on saving as that of asset markets on consumption, the arguments about the wealth effect of asset market performance as well as the balance sheet effects can be relevant to our discussion. However, our main focus in this paper is to examine the medium-run dynamics of the determinants of current account balances and saving and investment. Therefore, we focus on the comparison between the financial deepening view and the saving-glut view.

investment and saving are highly correlated. Although that correlation has diminished over the years, the extent of the correlation remains nontrivial. In this environment, further international portfolio diversification afforded by greater financial liberalization could yield potentially large benefits.[6]

Most directly related to the issue at hand, financial openness can affect saving and investment determination, and hence capital flows across borders. According to the global saving glut thesis, financial development coupled with comprehensive financial liberalization policies in East Asia would mitigate savings levels, and further allow excess saving to be "recycled" within the region, instead of flowing into the U.S. Similarly, Dooley et al. (2005) argue that, in the absence of a well-functioning domestic and/or regional financial system, East Asian countries essentially lend capital to the United States at low interest rates, in exchange for efficient financial intermediation. The capital returns to East Asia in the form of direct investment.

The efficacy and integrity of legal environment and the level of institutional development should also be important determinants for saving and investment decisions. A society's legal foundations and institutions define the context wherein financial transactions and economic decisions are made. Levine, et al. (2000) find that the cross-country differences in legal and regulatory systems influence the development of financial intermediation.[7] The literature identifies a number of channels by which legal and institutional development can affect investment and saving decisions. Whether the legal system clearly establishes law and order, minimizes corruption, or whether the administrative branch of the government protects property rights efficiently are all important determinants of the incentives to save and invest. Decisions by

[6] Tesar (1995) finds that the possible gains from further international risk sharing is minimal for developed countries, where financial markets are well-developed and relatively open and whose economies are relatively more synchronized with the world economy, while the gains for developing countries are possibly significant.
[7] See also Beck and Levine (2004), Johnson, et al. (2002), and Levine (2005) among others.

foreign residents will also be affected.[8]

2.2 Stylized Facts: Financial Development, Openness, and Institutions

Figure 2 illustrates development of financial markets in terms of the market size, which we measure using *SIZE*, the sum of private credit creation and stock market capitalization (both measured as ratios to GDP).[9,10] Throughout the period, most markets, notably the U.S., Western European, and Chinese markets (relative to GDP), have steadily grown. The exceptions are Japanese and ex-China East Asian financial markets experienced some retrenchment after the bursting of the bubble at the end of the 1980s and the financial crisis of 1997-98, respectively. After the first half of the 1990s, U.S. financial markets have been the sole winner in terms of the market size. The relative sizes of Western European and Japanese markets are both about 58% of those of the U.S., and those of East Asian and Chinese markets are about half of the U.S. financial markets.[11]

Beck et al. (2001) argue that the size of the financial system alone may not present a complete picture of financial development – a large financial market could be a relatively sedentary one involving few market activity. Hence, one needs to examine the activeness of financial markets, for which we use stock market total value traded (as the ratio to GDP; *SMTV*). Figure 3 compares *SMTV* across different countries and regions. In this figure also, we can make

[8] Chinn and Ito (2006) find that financial openness leads to financial development especially when a country is equipped with developed legal systems and institutions.

[9] All the measures of financial development are retrieved from the financial structure dataset created and subsequently updated by Beck et al. (2001).

[10] Demirguc-Kunt and Levine (2001) measures the overall size of the financial system by summing domestic assets of deposit money banks with stock market capitalization (both as ratios of GDP). However, since we want to focus on the private sector development of financial markets, that is more in line with financial development in real sense, we use private credit creation instead.

[11] Disaggregated pictures of the size of financial markets show that the relative size of financial markets in terms of either private credit creation or stock market capitalization individually are consistent with what is shown in Table 2. However, ex-China East Asian countries' and Chinese financial market developments differ from each other. While Chinese financial markets are more developed in the banking sector (its relative size to U.S. counterparts is about 63%), other East Asian countries are, on average, equipped with more developed equity markets (its relative size is about 81%).

the same generalizations as we did in Figure 2. The biggest difference from the previous figure is that the strength of U.S. financial markets is more pronounced when stock market total value is used as the measure of financial development; even the second most active financial markets, those in East Asia and Pacific, are only less than 40% of U.S. stock market total value (as a ratio to GDP).[12] This is clear evidence that U.S. stock markets are far more liquid than those in other regions and countries.

Figure 4 shows that the characterization of U.S. capital markets extends to private bond markets.[13] Even the private bond markets of Western European countries and Japan are less than half of U.S. counterparts, and only 22% and 9% for ex-China East Asia and China, respectively, showing overwhelming strength of U.S. capital markets.

Public bond market development presents a different picture, as shown in Figure 5. While oil exporting countries have had large public bond markets, Japan's public bond market size is also increasing rapidly, reflecting the sustained period of deficit spending in response to years of stagnant growth. The U.S. public bond market is still large compared to other regions, but not as large as these two regions.[14]

Following Chinn and Ito (2007a), we measure legal and institutional development using *LEGAL*, which is the first principal component of law and order (*LAO*), corruption (*CORRUPT*),

---

[12] Stock market turnover (*SMTO*) can be a measure of market activeness as well. We will use the variable later as a measure of market activeness. When *SMTO* is compared in the same way as other financial development measures, it is shown that China's stock market turnover was impressively high in the 1991-1995 and 1996-2000 periods, more than one and a half times as high as the U.S. figures. But this only reflects the fact that Chinese stock markets grew from a small market size.

[13] The variables for private and public bond market capitalization (*PVBM* and *PBBM*, respectively) are only available after 1990 and for industrialized countries and emerging market countries.

[14] In later sections, we use other measures of financial development, those pertaining to the cost performance or efficiency of the financial (mainly banking) industry. *INVNETINT* is an accounting value of bank's net interest revenue as a share of its interest-bearing (total earning) assets, inverted. *OVERHEAD* is an accounting value of a bank's overhead costs as a share of its total assets. For more details of data definitions, refer to Data Appendix.

and bureaucracy quality (*BQ*).[15] Figure 7 compares the level of legal and institutional development of different regions and countries with the U.S., whose value is normalized as 100. As one can expect, Western Europe and Japan have achieved levels of legal and institutional development comparable to the U.S. The other regions lag the developed countries; their relative levels of legal and institutional development are about 60% at most.

The degree of financial openness is compared in Figure 8 using the Chinn-Ito capital account openness index (*KAOPEN*). This index is based upon the IMF's categorical enumeration pertaining to cross-border financial transactions reported in *Annual Report on Exchange Arrangements and Exchange Restrictions* (*AREAER*). Higher values of this index indicate greater financial openness.[16] Like the *LEGAL* variable, financial openness is compared relatively to the U.S. While East Asian countries slowed down the level of financial openness after the Asian crisis, both the Latin American and Middle East/North African regions have been steadily opening their financial markets throughout the sample period. One outlier is China. Not only is the pace of financial liberalization slow, so too is its level low.

The above observations lead us to conclude that China and other East Asian developing countries have achieved impressive – but uneven – financial development. Especially when it comes to the bond market sector, East Asian economies continue to lag, despite initiatives to develop these markets. Interestingly, while the extent of legal and institutional development is comparable to other developing countries, China's financial opening significantly lags behind others as is evidenced by the U.S. persistent demand to China for further financial opening. Below, we will examine the effects of further development in financial markets and legal systems

[15] Higher values indicate better conditions. The choice of these variables is motivated by the literature on the finance and growth, as well as the wide coverage afforded by their use.
[16] More details about the data are found in Chinn and Ito (2007b).

with an eye to drawing out the implications of further opening of financial markets in East Asian emerging market countries.

3. Empirics

3.1 Specification and Estimation

We estimate regressions of the general form:

$$\begin{aligned} y_{i,t} = \alpha &+ \beta_1 FD_{i,t} + \beta_2 LEGAL_{i,t} + \beta_3 KAOPEN_{i,t} \\ &+ \beta_4 \left(FD_{i,t} \times LEGAL_{i,t}\right) + \beta_5 \left(LEGAL_{i,t} \times KAOPEN_{i,t}\right) + \beta_6 \left(KAOPEN_{i,t} \times FD_{i,t}\right) \\ &+ X_{i,t}\Gamma + u_{i,t} \end{aligned} \tag{1}$$

where three dependent variables (y), the current account balance, national saving, and investment, all expressed as a share of GDP, are regressed on *FD,* a measure of financial development; *KAOPEN*, a measure of financial openness; *LEGAL* a measure of legal/institutional development; and ***X***, a vector of macroeconomic and policy control variables. For *FD*, we will include a variable pertaining to financial development depending on an analysis of our interest. Following Chinn and Prasad (2003), the vector ***X*** contains control variables of "usual suspects" as the determinants of current account balances, namely, net foreign assets as a ratio to GDP; relative income (to the U.S.); its quadratic term; relative dependency ratios on you and old population; terms of trade volatility; output growth rates; trade openness (= exports+imports/GDP); dummies for oil exporting countries; and time fixed effects. The sample for our analysis covers both industrial and developing countries. The underlying database has annual data for 19 industrial and 70 developing countries covering the last twenty-year period 1986-2005.

For our empirical analysis, we use a panel that contains non-overlapping 5-year averages

of the data for each country. This approach mitigates the effect of measurement errors in annual data likely to be particularly problematic in data for developing countries. It also allows us to focus our interest in medium-term rather than business cycle variations in current account balances.[17] All the variables, except for net foreign assets to GDP, are converted into the deviations from their GDP-weighted world mean prior to the calculation of five year averages – net foreign asset ratios are sampled from the first year of each five-year panel as the initial conditions. The use of demeaned series controls for rest-of-world effects. In other words, a country's current account balance is determined by developments at home relative to the rest-of-the-world.

As the above arguments have made it clear, it is important to examine not only the effects of each of financial development, financial openness, and legal/institutional development, but also the interactions of these variables. Hence, we include in the estimation the interactions between financial development and legal variables (*PCGDP* × *LEGAL*), those between the financial development and financial openness variables (*PCGDP* × *KAOPEN*), and those between legal development and financial openness (*LEGAL* × *KAOPEN*). The financial and legal interaction effect is motivated by the conjecture that deepening financial markets might lead to higher saving rates, but the effect might be magnified under conditions of better developed legal institutions. Alternatively, if greater financial deepening leads to a lower saving rate or a lower investment rate, that effect could be mitigated when financial markets are equipped with highly developed legal systems. A similar argument can be applied to the effect of financial openness on

[17] Because we focus on medium term dynamics, the predictions of the Mundell-Fleming model are of limited relevance in this framework. For the same reason, we do not control for the type of the exchange rate regime; it is not directly relevant to the *level* of current account balances, but to the *speed* of current account adjustment. However, we will examine the effect of different exchange rate regimes in the robustness checks. For the short-term current account dynamics, refer to Chinn and Lee (2006).

current account balances.[18],[19]

3.2 Results from the Basic Model: Does Market Size Matter?

We first examine whether the size of financial markets (namely the sum of bank lending and equity markets as a ratio to GDP) matters for current account balances. Since these results are sensitive to the inclusion of the African countries, we also report separate sets of results with and without the African countries included for the developing country sample. We also report separate results for an emerging market group that differs somewhat from the developing country sample.[20]

Table 1 reports the results for the current account regressions for different subgroups. First, in contrast to the findings in Chinn and Ito (2007a), the budget balance variable is not statistically significant at conventional levels for any of the samples. A one percentage point increase (above the world GDP-weighted average) in the budget balance would lead to a 0.24 percentage point increase in the current account balance for industrialized countries (IDC) and a little smaller effect for developing country groups, though none of them are statistically significant (with its *p*-value being 15% for IDC and ranging from 12% to 17% for developing country groups).

This result differs from the results obtained in Chinn and Ito (2007a) where a one percentage point increase in the budget balance would lead to a 0.15 percentage point increase in

[18] Bailliu (2000) shows that capital inflows, a proxy to capital account openness, can foster economic growth only if the level of domestic financial development is above a certain threshold whereas Chinn and Ito (2006) find that financial openness leads to financial development especially when a country achieves a certain level of legal and institutional development.

[19] As Chinn and Ito (2006) have shown, financial development and financial openness can be highly correlated. However, inclusion of the interaction terms makes the model setting nonlinear and thereby collinearity between these variables less of an issue, thereby allowing us to identify independent effects of these variables.

[20] The definition of emerging market countries relies upon the International Financial Corporation's (IFC) indices. The group of emerging market countries in this study refers to the countries which were included in either the IFC's Global, Investible, or Frontier Index as of 1995.

the current account balance for industrialized countries (IDC) and a little higher results for developing country groups. The differing results are ascribable to the use of a different measure of financial development – private credit – and longer sample period.[21]

SIZE exhibits a negative coefficient only in the industrial countries while its interaction with *LEGAL* is significantly positive for ex-Africa LDC and EMG groups, and its interaction with *KAOPEN* is significantly positive for industrial countries and significantly negative for developing and emerging market countries. This finding indicates that, for industrial countries, an expansion of the size of financial markets tends to decrease the current account balance. This effect is mitigated if the country is more financially open. The coefficient on the interaction term involving financial development and financial openness implies that greater financial openness will increase an industrial country's propensity to export capital. Given these estimated relationships, U.S. behavior appears even more anomalous.

The dynamics between financial development, financial openness, and institutional development are different for developing countries. The estimated coefficients for both financial development and legal/institutional variables are significantly positive, while none of the *SIZE* coefficients are significant for financial development in any developing country grouping. *LEGAL* is marginally significant for LDC and ex-Africa LDC (its *p*-value being 12% and 13%, respectively) and significant for EMG. The level variable for financial openness is significantly negative for all developing country samples, suggesting that a financially closed country such as China is more likely to run current account surpluses (or smaller deficits). The significantly positive coefficient for the interaction between financial development and legal development indicates that a larger financial market enhances the effect of legal development. The significantly negative coefficient for the interaction between financial development and financial

[21] Also the *LEGAL* variable was included as a time-invariant variable.

openness indicates that a larger financial market lessens the effect of financial openness.

The interpretation of the regression coefficients is complicated by the inclusion of the interaction terms. Below, we will present some intuitive interpretations using some numerical examples. For now, the key stylized facts are that among developing countries, those with developed financial markets (in terms of their size), more advanced legal systems and institutions, and/or closed financial markets tend to run current account surpluses. With this generalization, it is unsurprising that China, with a large but closed financial market, equipped with a mediocre index of institutional development, is running a large current account surplus.[22] In this respect, China at first glance appears to fit the saving glut thesis. We return to this issue later.

The significantly positive coefficient for the oil exporting country dummy in the LDC and EMG samples are consistent with the recent rise in current account surpluses (and the accumulation foreign exchange reserves). Figure 1 demonstrates that the current account balances of "Middle East and N. Africa" rise and fall with oil price movements.

We also estimate the regressions for both the national saving and investment equations (results not reported). While the results of the current account regression for industrial countries and ex-Africa LDCs are more consistent with the national saving regression (in terms of the significance levels of the estimated coefficients of our interest and the goodness of fit of the model), those of less developed and emerging market country groups show greater consistency with the results from the investment regressions than from those of the national saving regression. In other words, financial development and its interactions with legal development and financial openness affect current account balances through national saving for the IDC and ex-Africa LDC groups, and through investment for the LDC and EMG groups.

Given that the *SIZE* variable is the sum of *PCGDP* and *SMKC*, we also ran regressions

[22] The estimation results for the EMG group are found to be robust to exclusion of China from the sample.

using each of the two variables in place of *FD* in equation (1) to identify which of the components of *SIZE* is driving the results for the regressions shown in Table 1 (results not reported).[23] In terms of the goodness of fit, it seems slightly more likely that the regressions with *PCGDP* have a better fit than those with *SMKC*. However, in terms of the statistical significance and economic magnitude of the estimated coefficients, we cannot determine which of the variables yield more consistent results with those in Table 1. At the very least, as far as the sample period in this study is concerned, banking sector and equity market development seem to be equally important.

3.2 Results for Extended Models: Activity and Efficiency

Clearly, *SIZE* is unlikely to convey the full complexity of financial development. To capture how *active* financial markets are, we use stock market turnover ratios (*SMTO*) as the measure.[24] Since an active market is not necessarily an efficient market, we also seek an efficiency measure. We are not able to obtain such a measure for equity markets, but rely upon a banking sector indicator, the net interest margin (*NETINT*). This variable is the banks' net interest revenues as a share of their interest-bearing (total earning) assets.[25] We invert this series (*INVNETINT*), and use it as a measure of market competitiveness of financial markets. We re-estimate the equation (1) model using these two variables. Also, since one can expect that market efficiency might affect international investors in a manner dependent upon market

[23] Both *PCGDP* and *SMKC* together cannot be included in the regressions because these two variables are highly correlated with each other and thereby yielding the issue of multicollinearity.

[24] In the previous section, we used *SMTV* as the measure of stock market activeness. However, this variable is so highly correlated with *SIZE* that including both variables would not yield meaningful results. Stock market turnover (*SMTO*) can be a misleading indicator of stock market activeness since it is normalized by the market size, not the size of the economy. However, since the estimation model already controls for the size of financial markets, *SMTO* can be a useful indicator of market activeness.

[25] Originally, a higher value of *NETINT* indicates more interest rate margin, i.e., less competitive market conditions. However, to make its interpretation easier, we inverted the variable such that a higher value of *INVNETINT* means less interest margin opportunities, and more competitive market conditions.

openness, we also include an interactive term between *INVNETINT* and *KAOPEN*.[26]

The results shown in Table 2 are promising.[27] Interestingly, inclusion of *SMTO*, *INVNETINT*, and interaction terms, has resulted in many heretofore marginally significant variables becoming more statistically and economically significant. Now, the estimated coefficients for financial development in all samples are significant – negative for industrial countries and positive for developing country groups.[28]

For all developing country groups, *SMTO*'s coefficients turn out to be significantly positive. This result suggests that countries with active financial (more particularly equity) markets might become capital exporters, instead of importers, contrary to the saving glut thesis or Dooley et al's "Bretton Woods II" hypothesis. When the national saving and investment regressions are examined (results not reported), the results indicate that the positive effect of stock market turnover is driven by its significantly positive entry to the national saving regression (with no corresponding effect in the investment regression). This result implies that more active financial markets can enhance national saving.

In industrial countries, a reduction in the net interest margin contributes to a lower current account balance, although the interaction terms seem to cancel out the linear effect for financially open countries. This means that an industrial country with more competitive, but less open, financial markets tends to have more smaller current account balances. For developing countries, more competitive financial markets seem to contribute to higher net saving; the level term of *INVNETINT* is found to be significantly positive for the LDC and ex-African LDC

[26] The results shown below are generally unchanged if we use *OVERHEAD*, banks' overhead costs as a share of their total assets, instead of *INVNETINT*.
[27] To conserve space in Table 2, we report the results only for the variables of interest. Complete results are available from the authors upon request.
[28] The magnitude and statistical significance for the oil exporter dummy increases as well.

groups (and marginally so for EMG). This result is driven more by the results in the investment regression, where both the *INVNETINT* level and interaction variables turn out to have significantly negative coefficients for the LDC and ex-African LDC groups, and only the interaction term for the EMG group.[29]

Inclusion of *SMTO*, *INVNETINT*, and interaction terms increases the statistical significance and the magnitude of the variables of our main interest, especially for the *LEGAL* variable and its interaction with *SIZE* and *KAOPEN*. Given the obvious policy implications, we assess the sensitivity of these results more extensively in the next section.

3.3 Robustness Checks

Before discussing the policy implications of our regression results, we conduct a few robustness checks. These checks include accounting for endogeneity of financial development, alternative measures of financial development, accounting for the exchange rate regime, excluding periods of financial crises and aftermaths, and separating out oil exporters from our sample. We address each of these aspects in turn.

With respect to the first issue, financial development itself could be endogenous with respect to a country's political and social infrastructure. Although we have used non-overlapping, five-year window panels to mitigate the problem of reverse-causality, it may still be worthwhile to conduct some robustness checks. To examine this flow of causality, we conduct 2SLS analysis by instrumenting the *SIZE* variable with some variables that can be the determinants of financial development. Boyd, et al. (2001) show that inflation significantly negatively affect both the

[29] The results found in this exercise are robust when the U.S. is removed from the IDC group and also when China is removed from the EMG group.

banking sector development and equity market activity. La Porta, et al. (1998) demonstrate that the national legal origin (whether English, French, German, or Scandinavian) strongly explains cross-country differences in financial development. Therefore, we conduct 2SLS using inflation rates and the dummies for the national legal origin as instruments.[30]

The instrumental variables regression analysis yielded qualitatively similar results to those obtained before. In general, the estimation results are slightly weaker for the industrial country group. For less developed country groups, the statistical significance rose for many of the variables of our interest, so did the magnitude in some cases. At least, for developing and emerging market countries, we can safely conclude that our results shown in Table 1 are not driven by endogeneity between the dependent variable and the financial development variable and its interactions.

There remain other types of financial markets we have not yet examined, such as private and public bond markets, and insurance markets. In an effort to fill that void, we construct an index that incorporates information on other aspects of financial development; we then re-estimate the regressions using this index (*SIZE2*) in the stead of *SIZE*. *SIZE2* is the first principle component of private credit creation (*PCGDP*), stock market capitalization (*SMKC*), stock market total value (*SMTV*), private bond market capitalization (*PVBM*), public bond market capitalization (*PBBM*), inverted net interest rate margin (*INVNETINT*), and life insurance premium as a ratio to GDP (*LIFEINS*). Figure 8 compares regions using this financial development index while normalizing the index of the U.S. as 100. The historical patterns of financial development are similar to those displayed in Figure 2. However, the underperformance of developing countries' financial markets as well as the U.S. relative strength appear more

[30] All instruments were included as five year averages of the deviations from world weighted averages. Also, the instruments found to be insignificant in the first stage regressions were dropped.

distinct, reflecting that developing countries lag behind in bond and life insurance markets.

We repeat the exercise in Table 1, using the composite index in place of *SIZE*.[31] Interestingly, the estimated coefficients in the current account regressions becomes more significant for developing country groups, but not so for the regressions involving IDC group. For the LDC groups, all the variables of our interest except for the interaction between *KAOPEN* and *LEGAL* become more than 5% significant.[32] We also conduct the 2SLS analysis by instrumenting in the same way as described above. Although the estimated coefficient for the composite index becomes insignificant, other coefficients behave similarly. The results are almost unaffected for the national saving and investment regressions.

There is a concern that one of the variables we have relied upon, private credit creation as a ratio to GDP (*PCGDP*), might provide an inaccurate depiction of financial development. In some economies, a large portion of financial intermediary is provided by public financial institutions, and the credit provided by such state-owned financial institutions to the private sector is included in *PCGDP*. This issue can become a concern when one uses this variable to proxy financial development in China, a country where the state has played a central role in the financial system. In order to address this concern, we adjust our measure by following the procedure outlined by Bekaert et al. (2006). Specifically, we take the La Porta et al. (2002) estimates of the ratios of government ownership of banks, and interpolate data over our sample period.[33] *PCGDP* is then multiplied by (1 minus the ratio of government ownership of banks).

---

[31] The sample size is substantially reduced as *PVBM* and *PBBM* are available only after 1990 for a much smaller number of countries (especially for developing countries). Hence, the LDC group becomes the same as the EMG group.

[32] The coefficient estimates in the national saving regression become more significant for the IDC, whereas those of the investment become slightly less significant. However, the results are qualitatively the same as what we have found for IDC and LDC groups.

[33] La Porta et al. (2002) provide the estimates of the ratios of government ownership of banks for 92 developed and developing countries for 1970 and 1995. Bekaert et al. (2006) use La Porta et al's data and interpolate the ratios for their sample period. Obviously, this method is not perfect; efforts of privatization are often discrete (e.g., after experiencing a crisis) and also are not necessarily monotonic in movement.

Using this "adjusted" *PCGDP*, we reconstruct the *SIZE* variable (*SIZE2A*).

The *SIZE2A* series are compared across different regions and with the U.S. in Figure 9. The effect of the adjustment for government ownership of banks is striking for developing countries. In the 2001-05 period, the size of financial markets for China, Latin America, and other countries is less than 20% of U.S. In fact, China's size of financial markets is merely 13.1% of the U.S., confirming that China still has a long road to financial development.

Last, we re-estimate the regressions using the adjusted *SIZE* variable. Interestingly, the results (not reported) are little changed, especially for developing countries. In other words, the results we have in Table 1 are robust to the adjustment for government's involvement in the financial sector. This result is somewhat surprising.

We also assessed the importance of the exchange rate regime. In our model setting, there is no obvious reason why different exchange rate regimes should affect the level of current account balances, though they may affect the speed of current account adjustment. While we do find the estimated coefficient on the dummy for the crawling exchange rate regime to be significantly positive for emerging market countries, inclusion of two other exchange rate dummies has little quantitative or qualitative impact upon the results shown in Tables 1 and 2.

Edwards (2002) argues that current account deficits are correlated with the probability of financial crises occurring, suggesting that current account dynamics surrounding crisis years might exhibit anomalous behavior. Taking the 1997-98 period as one characterized as crisis years, we reconstruct the 5-year panels to exclude this period, and re-estimate our model. The estimation results remain intact. Similarly, we find that excluding post-1995 data does not make a substantial impact on the results.

We also consider whether oil exporters behave in a fundamentally different manner than non-oil exporters. While we included an "oil exporter" dummy variable in our basic regression

specification, if being an oil exporter means that the slope coefficients are substantially different than those obtaining for non-oil exporters, then a dummy variable is not sufficient to address the issue of heterogeneity. When we exclude oil exporters from either the LDC or EMG subsample, the results are virtually unchanged.

4. Policy Implications

One question that immediately arises is whether one should be surprised at the current set of global imbalances, given the estimates reported above. Figure 10 displays both actual and predicted current account balances for the industrial country group (Panel A) and the emerging market group (Panel B). In Panel A, we can see that the U.S. is one of the countries that experienced a larger current account deficit than predicted by the model.[34] Panel B shows that many of emerging East Asian countries appear in the area above the 45 degree line; they experienced larger current account surpluses than predicted by the model.[35]

A second question that can be asked is what will happen to East Asian current account balances if financial development and liberalization accelerates. Thus far, we have found some evidence that financial development affects current account balances. Here, we need to interpret how the estimated coefficients on financial development variable (*SIZE*) would affect current account balances, national saving, and investment in interaction with other institutional variables (*LEGAL* and *KAOPEN*). Also, we examine the effect of financial opening conditional upon the levels of financial and legal/institutional development.

---

[34] The 45 degree line refers to the points where both actual and predicted values are the same. Hence, in the area above the 45 degree line, actual values are higher than predicted ones, meaning that countries' current account balances are underpredicted by the model.

[35] The prediction errors shown in Figure 10 are consistent with either model misspecification or current account behavior being delinked from the fundamentals (and hence being unsustainable). Determination of which interpretation is more appropriate is outside the scope of this paper. Refer to Clarida (2007) for a debate regarding the issue of current account sustainability.

Panels A, B, and C in Figure 11 shows the total effect on current account, national saving, and investment (in terms of percentage points as a ratio to GDP), respectively, if the size of financial markets (*SIZE*) rises by 10% point above the world weighted average conditional on the levels of *LEGAL* and *KAOPEN* for emerging market countries.[36,37] The calculation is made based on the regression results shown in Column 4 of Table 2, and depending on whether the levels of *LEGAL* and *KAOPEN* are in the low decile, mean, or high decile in each subsample. This exercise illustrates how the impact of financial development can vary with the level of these two variables. For example, Panel A shows that a 10% point increase in *SIZE* (expressed as the deviation from the world weighted average) can lead an emerging market country equipped with both legal development and financial openness levels above the low 10 percentile (i.e., the bar at the northwest corner on the floor) to lower its current account as a ratio to GDP by a 0.186 percentage point. Examining the bars at the same location in the other two panels allows us to determine whether the effect of such as a change comes from national saving or investment, or both.

Theoretically, the total effects of financial development shown in the panels on national saving and investment should add up exactly to that on current account balances. However, as can be seen in the figures, this is not the case. At least, two reasons can be identified for this outcome. First, while the current account regressions account for the covariance of national savings and investment, simply adding two coefficients does not.[38] Second, due to differing data

[36] Between the 1996-2000 and 2001-05 time periods, the (five-year average of *relative*) *SIZE* level – the level of financial deepening above or below the weighted world average – increased by 16.3 percentage points for Asian emerging market countries, and an astounding 39 percentage points for China. Therefore, examining the effect of a 10% percentage point is not too unrealistic.

[37] This calculation holds other variables constant, including the level of stock market activeness (*SMTO*) and market efficiency (*INVNETINT*).

[38] If some change in one variable affects national saving and investment independently, as long as the change in national saving and investment does not affect each other, the net effect of the change ($\Delta NS - \Delta I$) would be the same as that on current account balances. However, if national saving and investment are highly correlated, as has been

conventions (Balance of Payments accounting versus national income accounting definition), the flows may not add up exactly. However, it is still worthwhile to examine the total effect on all three variables.

For emerging market countries, we can generalize the total effect of financial development on current account balances as that the more financially open and the less legally/institutionally developed an emerging market country is, the more negative the total effect of financial development on the current account balance is to be. The result seems to be driven by the effects on both national saving and investment. Those countries that experience current account deterioration experience both deterioration in national saving and improvement in investment (except for those with mean *KAOPEN* and mean *LEGAL*).

Panel D of Figure 11 categorizes emerging market countries in East Asia depending on the level of legal development and financial openness. The matrix shows that only Hong Kong and Singapore are categorized as countries with highest 10 percentile legal development and highest 10 percentile financial openness, while many Asian emerging market countries, including China, are categorized in the groups with the middle or lower level of legal development and financial openness. For these economies, financial development might lead to deterioration of current account balances *if* the economy is more open than the bottom decile and its legal systems are not in the top decile.

What about financial opening? We have seen that China in particular has kept its financial markets closed, sparking considerable debate over what would occur in the event of capital account liberalization. Figure 12 presents a parallel analysis to what we did in Figure 11, but this time, we examine the total effect of financial opening, a one unit increase in *KAOPEN*,

---

found in many studies such as Feldstein and Horioka (1980) and Frankel et al. (1987), simply adding two coefficients does not yield the coefficient in the current account regression.

conditional upon the level of legal/institutional development and the size of financial markets. Panels A, B, and C report the total effect of financial opening on current account balances, national saving, and investment, respectively, for emerging market countries, and Panel D ranks East Asian emerging market countries by the level of financial openness measured by *KAOPEN*.

Panel A of Figure 12 indicates that financial opening, holding the levels of both legal and financial development constant, would result in a typical emerging market economy experiencing a deteriorating current account balances, except when the economy is financially underdeveloped. Panels B and C show that the deterioration can be driven by either a large decrease in national saving combined with a smaller decrease in investment or a relatively smaller decrease in national saving combined with an improvement in investment. Either outcome is consistent with the saving glut hypothesis, although our results lead to a more nuanced view of the sources of the current account shift.

A one unit increase in *KAOPEN* is equivalent to China increasing its level of financial openness to that of Korea, Malaysia, and Thailand. If one uses the observed Chinese values of *SIZE, LEGAL,* and *KAOPEN,* the implied impact on China's current account balance would be a one percentage point decline. Considering that the size of current account surplus for the 2001-05 period is 3.5%, this is not a non-trivial effect, although it must be kept in mind that the posited change in openness is very large.

One caveat involves the proper measure of financial development in China, a particularly salient issue. If one measures financial market size adjusting for government bank ownership, the effect would be considerably smaller, about 0.35 percentage points. Thus, we believe the question of how much the Chinese current account balance would be affected by capital account opening remains an open one.

4.3 A Magnification Effect of Bond Markets?

Our discussion thus far has focused on the Western side of the Pacific Ocean, with little reference to the U.S. The observation that the U.S. attracts capital from the rest of the world because of its deep and sophisticated financial markets has become something of a cliche. One separate, but related, line of argument is that for such an economy, financial development can function as a magnifier for the effect of other saving-investment determinants, especially budget balances. The idea is that a country with highly developed financial markets may find its budget constraint relaxed because its highly developed financial markets make it easier for the government to finance its budget. Chinn and Ito (2007a) were unable to find any evidence for this conjecture. Here, we take the opportunity to re-examine the magnifier effect with reference to the link between the budget and current account balances.

Table 5 reports the regression results that incorporate the effect of public bond market development (measured by *PBBM*, public bond market capitalization as a ratio to GDP) and its interactive, i.e., magnifier, effect with budget balances. Columns (1) and (2) show the results for industrialized and emerging market countries, respectively, when the *PBBM* variable and its interaction with the budget balance variable are added to our basic model.[39] Since the *PBBM* data are limited, there is only an EMG group among the developing country groups. Columns (3) and (4) include stock market turnover, net interest margin, and its interaction with *KAOPEN*. Interestingly, for the industrial country group, whether in Column (1) or (3), the interaction term enters significantly. For emerging market countries, the level term for *PBBM* is significantly negative, but the interaction term is insignificant. The significant coefficient on *PBBM* for emerging market countries may reflect the tendency that emerging market countries attempt to

[39] We also include a dummy for Japan since, as Figure 5 shows, Japan, a country with not only a big public bond market, but also big current account surpluses, can be driving the results as an outlier. In fact, the estimated coefficient for the dummy is found to be significantly positive.

borrow abroad to finance their budgetary programs. Using the actual 5-year average of the U.S. budget balance and the estimates from Columns (1) and (3), the estimated coefficient of is found to be as high as 0.487 and 0.642, respectively. These figures are around the high end of the value range of 0.10-0.49 found in Chinn and Ito (2007a).

As was shown in Figure 5, Japan and oil exporting countries in the Middle East, both of which are big current account surplus countries, could be driving the results as outliers. Also, the magnifier effect of financial development can be more important for those countries that try to finance themselves from foreign capital. Therefore, we re-estimated by restricting our sample to only country-years when the net foreign assets (that are included only from the first year of each five-year panel) are negative. The results are shown in Columns (5) and (6) for industrial and emerging market countries, respectively. Now in these specifications, the significance of the estimated coefficient on the interaction term disappears for the IDC group, though the significant coefficient for the *PBBM* variable remains for the EMG group. However, interestingly, the estimated coefficient on budget balances for industrial countries remain significant and its magnitude is still high, 0.48. (the *p*-value for the interaction term is now 22%). At the very least, budget balances seem to play an important role for current account balances for industrial countries.

5. Concluding Remarks

In this paper, we have taken a closer look at the effect of financial development on the present configuration of global imbalances. In particular, we scrutinized the effect of financial development from various perspectives: different types of financial markets such as equity, bond, and insurance markets as well as different aspects of financial development such as the cost performance, size, and activeness of the industry. We also examined the role of nonlinearities, in

terms of interactions with financial openness and institutional development.

The empirical results from our basic model suggest that the size of financial markets does matter for saving and investment determination. Among developing countries, those with developed financial markets (in terms of their size), better legal systems and institutions, and/or closed financial markets tend to run current account surpluses. We also found that banking sector and equity market development seem to be equally important.

We also extended our basic model by including variables that control for the degree of activity of financial markets, as well as for market competitiveness. Based upon the results from this extended model, we determined that that an industrial country with more competitive, but less open, financial markets tends to run larger current account surpluses. For developing countries, more competitive financial markets result in a tendency to run larger current account surpluses, a finding in contradiction to the saving glut thesis. Also, developing countries with active equity markets tend to become capital exporters, largely because more active equity markets induce greater national savings. This result is again in contradiction to the saving glut hypothesis.

Generally, we found that for emerging market countries, financial development may lead to deterioration of current account balances *if* the economy exhibits greater than the average openness and a legal system not in the top decile. In other cases, this linkage is not apparent. Moreover, greater financial opening tends to make an emerging market economy run a smaller current account surplus, especially if the economy is financially underdeveloped.

We also investigated whether financial development – rather than shifting the saving and investment schedules –magnifies the impact of other determinants of saving and investment behavior. More specifically, we examined whether public bond markets contribute to relaxing budget constraints and jointly to affecting current account balances. We find some limited

evidence in favor of such a magnification effect. One interesting finding is that inclusion of a bond market variable results in an estimated impact of the budget balance on the current account balance that is substantially higher than that obtained in many other studies, including our previous study (Chinn and Ito, 2007a).

Overall, our investigation revealed numerous results relevant to the debate over the sources of global imbalances. At the minimum, we have demonstrated that these two hypotheses might have not be exclusionary. First, as we have shown in our previous study, budget balances should not be ruled out as a determinant of current account balances. A one-percentage point improvement in the budget balance can lead to about half a percentage point improvement in current account balances for industrialized countries. Second, when we focus on the competitiveness of banking markets or the activeness of capital markets as a measure of financial development, we find the evidence against the saving glut hypothesis. That is, more competitive banking markets or more active equity markets do not necessarily lead countries to become greater capital importers. Third, in terms of the size, financial development does matter for current account balances, but the effect is conditional upon other institutional factors such as capital account openness and legal or institutional development. Fourth, financial openness leads to current account deterioration in a manner consistent with some aspects of the saving glut hypothesis predicts. That is, countries with more developed legal systems and more developed financial markets (in terms of the size) tend to experience smaller current account surpluses.

Data Appendix

The data used in this paper were drawn from a number of different sources. We provide below a listing of the mnemonics for the variables used in the analysis, descriptions of these variables and the source(s) from which the primary data for constructing these variables were taken. A listing of the countries in the final sample, along with the country groupings used in the analysis, is provided in the working paper version of this paper. For most countries, data were available from 1971 through 2004.

Mnemonic	**Source***	**Variable description**
CURRENT	WDI, IFS, WEO	Current account to GDP ratio
NATL_SAVING	WDI	National saving to GDP ratio
GROSS_KF	WDI	Capital formation to GDP ratio
GSUR	WDI, IFS	General government budget balance, ratio to GDP
NFA	LM	Stock of net foreign assets, ratio to GDP
RELY	WDI	Relative per capita income, adjusted by PPP exchange rates, Measured relative to the U.S., range (0 to 1)
RELDEPY	WDI	Youth dependency ratio, Population under 15 / Population between 15 and 65
RELDEPO	WDI	Old dependency ratio, Population over 65 / Population between 15 and 65
YGRAVG	WDI	Average real GDP growth
TOTSD	WDI	Standard deviation of terms of trade
OPEN	WDI	Openness indicator: ratio of exports plus imports of goods and nonfactor services to GDP
SIZE	BDL, Authors' calc.	Financial Market Development in terms of its size, PCGDP + SMKC
PCGDP	BDL	Private credit creation as a ratio to GDP
SMTV	BDL	Stock market total value as a ratio to GDP, as a measure of financial market activeness
SMTO	BDL	Stock market turnover
PVBM	BDL	Private bond market capitalization as a ratio to GDP
PBBM	BDL	Public bond market capitalization as a ratio to GDP
LIFEINS	BDL	Life insurance premium as a ratio to GDP
OVERHEAD	BDL	Accounting value of a bank's overhead costs as a share of its total assets
(INV)NETINT	BDL	Accounting value of bank's net interest revenue as a share of its interest-bearing (total earning) assets.
SIZE2	BDL, Authors' calc.	General level of financial development, first principal component of *PCGDP*, *SMKC*, *SMTV*, *PVBM*, *PBBM*, *INVNETINT*, and *LIFEINS*
SIZE2A	BDL, Authors' calc.	*SIZE* adjusted for the size of public sector involvement
KAOPEN	Chinn-Ito	Capital account openness
BQ	ICRG	Quality of Bureaucracy
LAO	ICRG	Law and order
CORRUPT	ICRG	Corruption index
LEGAL	Authors' calculations	General level of legal development, first principal component of BQ, LAO, and CORRUPT.

* These are mnemonics for the sources used to construct the corresponding. BDL: Beck, Demirgüc-Kunt,

and Levine (2001, updated in following years); CI: Chinn and Ito (2006); ICRG: *International Country Risk Guide*; IFS: IMF's *International Financial Statistics*; IMF: Other IMF databases; LM: Lane and Milesi-Ferretti (2006); and WDI: *World Development Indicators* (2006).

References

Alfaro, L., Kalemli-Ozcan, S. , and Volosovych, V. 2003. "Why Doesn't Capital Flow from Rich to Poor Countries? An Empirical Investigation," manuscript,, University of Houston.

Bailliu, J. N., 2000. Private Capital Flows, Financial Development, and Economic Growth in Developing Countries, Working Papers 00-15, Bank of Canada.

Beck, T., Levine, R., 2004. Legal Institutions and Financial Development, in: Claude Menard and Shirley M. (Eds.), *Handbook of New Institutional Economics*. Kluwer Dordrecht, The Netherlands.

Beck, T., Demirgüc-Kunt, A., Levine, R., 2001. A new database on financial development and structure. In Demirgüc-Kunt, A., Levine, R. (Eds.) *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. MIT Press, Cambridge, MA.

Bekaert, G., Harvey, C. R., Lundblad, C., 2006. "Financial Openness and the Chinese Growth Experience." mimeo.

Bernanke, B., 2005. The Global Saving Glut and the U.S. Current Account. Remarks at the Sandridge Lecture, Virginia Association of Economics, Richmond, VA, March 10.

Boyd, J. H., Levine, R., Smith, B. D., 2001. The Impact of Inflation on Financial Sector Performance. *Journal of Monetary Economics* 47, pp. 221-248.

Caballero, Ricardo, Emmanuel Farhi, and Pierre-Olivier Gourinchas, 2006, An Equilibrium Model of Global Imbalances and Low Interest Rates, NBER Working Paper No. 11996.

Chinn, M. Lee, J., 2006. Current Account and Real Exchange Rate Dynamics in the G-7 Countries, *Journal of International Money and Finance 25* (March): p. 257-274.

Chinn, M. Prasad, E., 2003. Medium-Term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration. *Journal of International Economics* 59(1) (January): 47-76. Also NBER Working Paper #7581 (March 2000).

Chinn, M. Ito, H., 2007a. Current Account Balances, Financial Development and Institutions:

Assaying the World 'Savings Glut,' *Journal of International Money and Finance*, Volume 26, Issue 4 (June), p.546-569.

Chinn, M. Ito, H., 2007b. "A New Measure of Financial Openness," mimeo.

Chinn, M. Ito, H., 2006. What Matters for Financial Development? Capital Controls, Institutions, and Interactions. *Journal of Development Economics* Vol. 82, p. 163 – 192, also NBER Working Paper #11370.

Clarida, R. 2005a. Japan, China, and the U.S. Current account deficit. *CATO Journal* Vol. 25, No. 1 (Winter).

Clarida, R., 2005b. Some Thoughts on 'The Sustainability and Adjustment of Global Current Account Imbalances.' Speech given at the Council on Foreign Relations, March 28.

Clarida, R. H., Ed., 2007. *G7 Current Account Imbalances: Sustainability and Adjustment.* Cambridge, MA: National Bureau of Economic Research.

Demirguc-Kunt, Asli & Levine, Ross, 2001. "Bank-based and market-based financial systems - cross-country comparisons," In Demirgüc-Kunt, A., Levine, R. (Eds.) *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. MIT Press, Cambridge, MA.

Dooley, M., Folkerts-Landau, D., and Garber, P. 2005. *International Financial Stability: Asia, Interest Rates, and the Dollar*, Deutsche Bank Global Research.

Edwards, S., 2005. Is the U.S. Current Account Deficit Sustainable? And if not, How Costly Is Adjustment Likely to be? NBER Working Paper #11541.

Edwards, S., 2002: "Does the Current Account Matter?", in *Preventing Currency Crises in Emerging Markets*, Sebastian Edwards and Jeffrey A. Frankel (editors), The University of Chicago Press.

Edwards, S., 1996. Why Are Latin America's Saving Rates So Low: An International Comparative Analysis. *Journal of Development Economics*, Vol. 51.

Feldstein, M., Horioka, C., 1980. Domestic Saving and International Capital Flows. *Economic Journal* 90, p. 314 – 329.

Frankel, J., Dooley, M., Mathieson, D., 1987. International Capital Mobility in Developing Countries vs. Industrialized Countries: What Do Saving-Investment Correlations Tell Us? IMF Staff Papers, 34, no. 3 (September), p. 503 – 530.

Gale, W., Orszag, P., 2004. Budget Deficits, National Saving, and Interest Rates. *Brookings Papers on Economic Activity*: 2. Brookings Institution, Washington, D.C. p. 101 – 210.

Johnson, S., McMillan, J., and Woodruff, C., 2002. Property rights and finance. *American Economic Review* 92, 1335 – 56.

King, R. G. and Levine, R., 1993. Finance and Growth: Schumpeter Might Be Right, *Quarterly Journal of Economics*, 108: 717 – 738.

Kose, M. A., E. Prasad, K. Rogoff, and S. J. Wei, 2006, "Financial Globalization: A Reappraisal," IMF Working Paper, WP/06/189.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2002. "Government Ownership of Banks." *Journal of Finance,* Vol. 57, No. 1 (February), p. 265-301.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W., 1998. "Law and Finance." *Journal of Political Economy*, 106(6): 1113 – 1155.

Lane, P., Milesi-Ferretti, G. M., 2006. The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970 - 2004. IMF Working Paper, WP/06/69.

Levine, R., 2005. Finance and Growth: Theory and Evidence. In: Aghion, P. Durlauf, S. (Eds.) *Handbook of Economic Growth*. The Netherlands: Elsevier Science.

Levine, R., Loayza, N., Beck, T., 2000. Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics* 46: 31-77.

Mendoza, E.G., Quadrini, V., and Ríos-Rull, J.-V., 2006. Financial Integration, Financial Deepness and Global Imbalances. Paper presented at the 7th Jacques Polak Annual Research Conference, November 9-10.

Obstfeld, M. and Rogoff, K., 1996. *Foundations of International Macroeconomics.* Cambridge: MIT Press.

Rajan, R.G., and Zingales, L., 1998. Financial Dependence and Growth, *American Economic Review*, 88: 559 – 586.

Tesar, L., 1995. Evaluating the Gains from International Risksharing,. *Carnegie-Rochester Conference Series on Public Policy,* 42, pp. 95-143.

Wurgler, J., 2000. Financial Markets and the Allocation of Capital, *Journal of Financial Economics*, 58, 187 – 214.

Table 1: Current Account Regressions with the *SIZE* Variable

	Industrial Countries (IDC) (1)	Less Developed (LDC) (2)	LDC w/out Africa (3)	Emerging Market (EMG) (4)
Government budget balance	0.236	0.151	0.211	0.146
	[0.162][15%]	[0.112]	[0.134]	[0.117]
Net foreign assets (initial)	0.058	0.042	0.037	0.043
	[0.017]***	[0.007]***	[0.012]***	[0.008]***
Relative income	0.101	-0.122	-0.028	-0.126
	[0.038]***	[0.097]	[0.098]	[0.113]
Relative income squared	-0.452	-0.123	0.012	-0.139
	[0.195]**	[0.114]	[0.118]	[0.128]
Dependency ratio (young)	0.028	-0.012	-0.02	0.011
	[0.038]	[0.020]	[0.021]	[0.023]
Dependency ratio (old)	0.07	-0.016	-0.023	-0.011
	[0.034]**	[0.017]	[0.017]	[0.023]
Financial Develop. (*SIZE*)	-0.032	0.015	0.015	0.014
	[0.015]**	[0.010]	[0.012]	[0.009]
Legal development (*LEGAL*)	0.023	0.017	0.02	0.021
	[0.012]**	[0.009]*	[0.011]*	[0.010]**
SIZE x *LEGAL*	0.014	0.015	0.013	0.019
	[0.012]	[0.006]**	[0.008][11%]	[0.007]***
Financial open. (*KAOPEN*)	0.016	-0.013	-0.014	-0.014
	[0.012]	[0.006]**	[0.008]*	[0.007]**
KAOPEN x *LEGAL*	0.01	0.001	0.001	0
	[0.008]	[0.002]	[0.002]	[0.002]
KAOPEN x *SIZE*	0.03	-0.006	-0.009	-0.008
	[0.014]**	[0.003]*	[0.004]**	[0.003]**
TOT volatility	0.107	0.012	0.017	0.02
	[0.071]	[0.025]	[0.024]	[0.028]
Avg. GDP growth	0.146	-0.04	-0.229	0.069
	[0.311]	[0.151]	[0.145]	[0.163]
Trade openness	0.024	0.032	0.021	0.037
	[0.016]	[0.011]***	[0.013]*	[0.013]***
Oil exporting countries	–	0.041	0.027	0.043
	–	[0.013]***	[0.018]	[0.013]***
Observations	81	156	125	125
Adjusted R-squared	0.52	0.55	0.52	0.59

All the variables to be included in the estimation, except for net foreign assets to GDP, are converted into the deviations from the GDP-weighted world mean before being calculated into the five year averages. Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients for the time-fixed dummies and constant are not shown.

Table 2: Current Account Regressions with the *SIZE, SMTO, and NETINT* Variables

	Industrial Countries (IDC) (1)	Less Developed (LDC) (2)	LDC w/out Africa (3)	Emerging Market (EMG) (4)
Government budget balance	0.187	0.228	0.231	0.237
	[0.191]	[0.113]**	[0.152]	[0.126]*
Financial Develop. (*SIZE*)	-0.03	0.019	0.02	0.02
	[0.013]**	[0.009]**	[0.011]*	[0.009]**
Stock Market Activeness (*SMTO*)	0.015	0.009	0.007	0.009
	[0.012]	[0.004]**	[0.004]*	[0.005]*
Net Interest Margin (*INVNETINT*)	-0.901	0.374	0.376	0.246
	[0.505]*	[0.152]**	[0.197]*	[0.152]$^{11\%}$
INVNETINT x *KAOPEN*	0.809	0.042	0.081	0.018
	[0.367]**	[0.066]	[0.076]	[0.062]
Legal/Inst. development (*LEGAL*)	0.025	0.031	0.032	0.032
	[0.011]**	[0.009]***	[0.012]***	[0.009]***
SIZE x *LEGAL*	0.01	0.024	0.022	0.027
	[0.012]	[0.006]***	[0.008]***	[0.006]***
Financial openness (*KAOPEN*)	0.019	-0.016	-0.017	-0.019
	[0.010]*	[0.006]***	[0.008]**	[0.007]***
KAOPEN x *LEGAL*	0.002	0	0.002	0
	[0.008]	[0.002]	[0.002]	[0.002]
KAOPEN x *SIZE*	0.029	-0.009	-0.012	-0.011
	[0.013]**	[0.003]***	[0.004]***	[0.003]***
Oil exporting countries	–	0.054	0.05	0.048
	–	[0.015]***	[0.020]**	[0.016]***
Observations	77	140	114	112
Adjusted R-squared	0.56	0.63	0.58	0.65

All the variables to be included in the estimation, except for net foreign assets to GDP, are converted into the deviations from the GDP-weighted world mean before being calculated into the five year averages. Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients for relative income, its quadratic term, young dependency ratio, old dependency ratio, TOT volatility, output growth, trade openness, the time-fixed dummies and constant are not shown.

.

Table 3: The Impact of Public Bond Market Development in Current Account Regressions

	Industrial Countries (IDC)	Emerging Market (EMG)	Industrial Countries (IDC)	Emerging Market (EMG)	Debtor Industrial Countries (IDC)	Debtor Emerging Market (EMG)
	(1)	(2)	(3)	(4)	(5)	(6)
Government budget balance	0.503	0.105	0.619	0.199	0.481	0.076
	[0.153]***	[0.300]	[0.176]***	[0.309]	[0.241]*	[0.366]
Budget balance x PBBM	-0.767	-0.216	-1.11	0.628	-0.741	0.952
	[0.394]*	[1.116]	[0.278]***	[1.375]	[0.590]	[1.664]
Public Bond Mkt. Dev. (PBBM)	0.005	-0.054	-0.004	-0.135	0.016	-0.144
	[0.017]	[0.038]	[0.015]	[0.036]***	[0.019]	[0.038]***
Financial Develop. (*SIZE*)	-0.022	0.013	-0.027	0.02	-0.034	0.038
	[0.011]*	[0.014]	[0.012]**	[0.012]	[0.015]**	[0.016]**
Stock Market Activeness (*SMTO*)			0.022	0.016	0.027	0.015
			[0.009]**	[0.006]***	[0.012]**	[0.006]**
Net Interest Margin (*INVNETINT*)			-0.332	0.686	-0.309	0.616
			[0.445]	[0.238]***	[0.460]	[0.306]*
NETINT x *KAOPEN*			-0.395	0.226	-0.327	0.208
			[0.493]	[0.083]***	[0.518]	[0.108]*
Legal/Inst. development (*LEGAL*)	0.02	0.019	0.016	0.032	0.026	0.027
	[0.010]**	[0.013]	[0.011]	[0.010]***	[0.015]*	[0.013]**
SIZE x *LEGAL*	0.024	0.016	0.031	0.028	0.034	0.025
	[0.012]*	[0.009]*	[0.012]**	[0.007]***	[0.014]**	[0.010]**
Financial openness (*KAOPEN*)	-0.008	-0.024	-0.011	-0.026	-0.015	-0.022
	[0.009]	[0.010]**	[0.009]	[0.009]***	[0.011]	[0.010]**
KAOPEN x *LEGAL*	0.022	-0.002	0.022	-0.001	0.022	-0.002
	[0.006]***	[0.003]	[0.009]**	[0.003]	[0.010]**	[0.003]
KAOPEN x *SIZE*	0.005	-0.009	0.001	-0.017	-0.003	-0.012
	[0.011]	[0.004]**	[0.010]	[0.003]***	[0.011]	[0.006]**
Observations	80	72	76	65	55	58
Adjusted R-squared	0.65	0.60	0.71	0.77	0.63	0.49

All the variables to be included in the estimation, except for net foreign assets to GDP, are converted into the deviations from the GDP-weighted world mean before being calculated into the five year averages. Robust standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients for relative income, its quadratic term, young dependency ratio, old dependency ratio, TOT volatility, output growth, trade openness, the time-fixed dummies and constant are not shown. There is no oil exporting countries in any of the subsamples.

Figure 1: Current Account Balances by Region

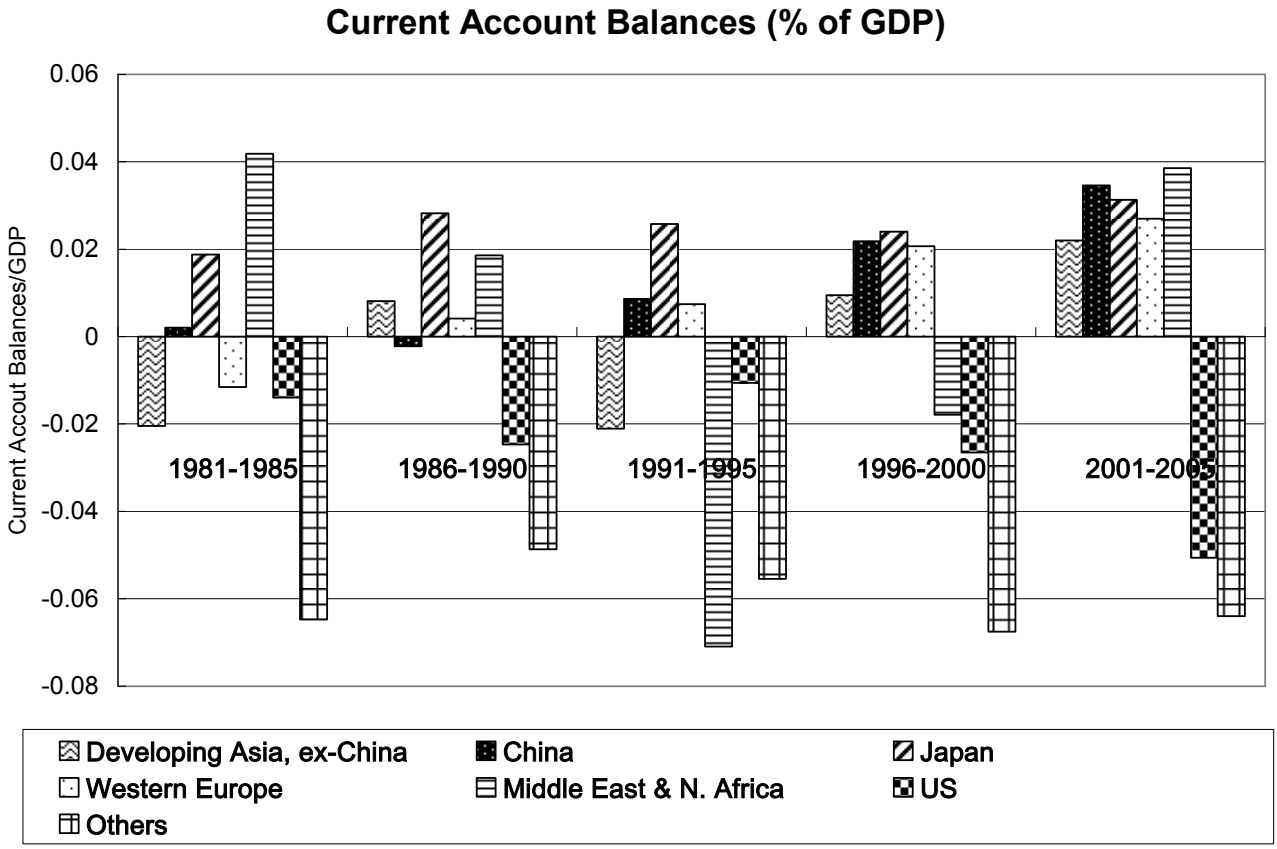


Figure 2: Financial Market Development (Size)

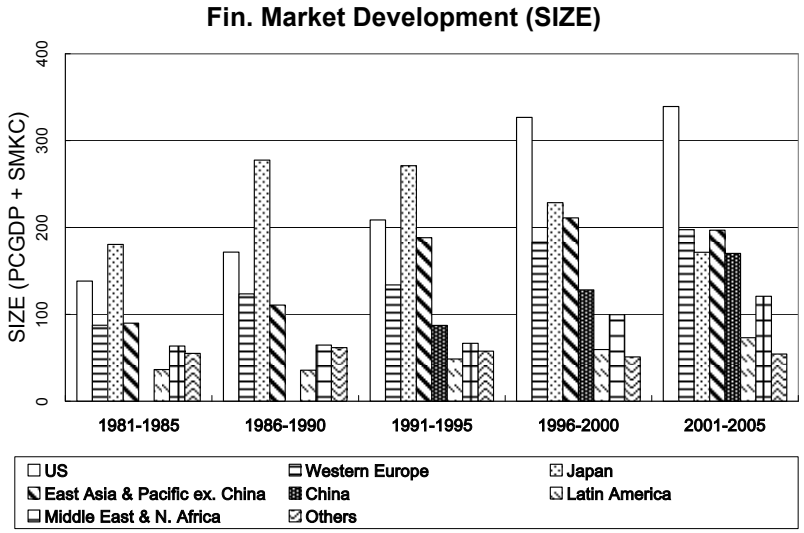


Figure 3: Financial Market Development (Activeness)

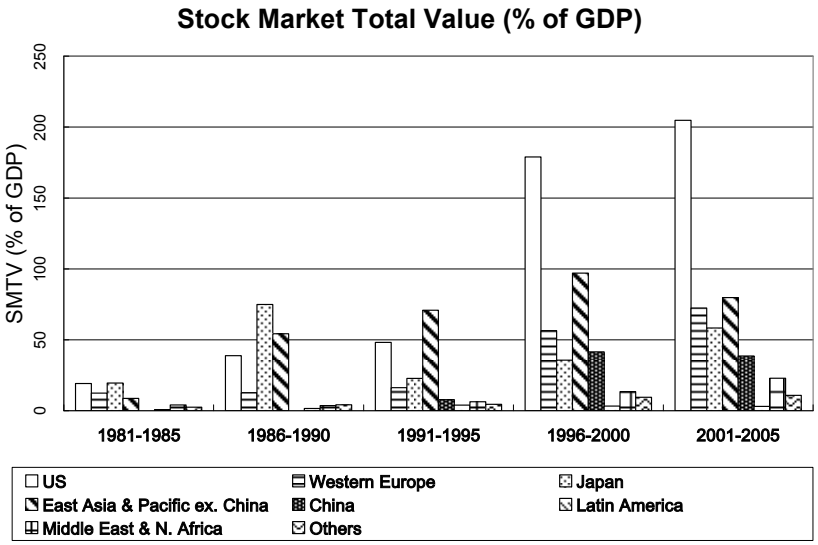


Figure 4: Private Bond Market Development

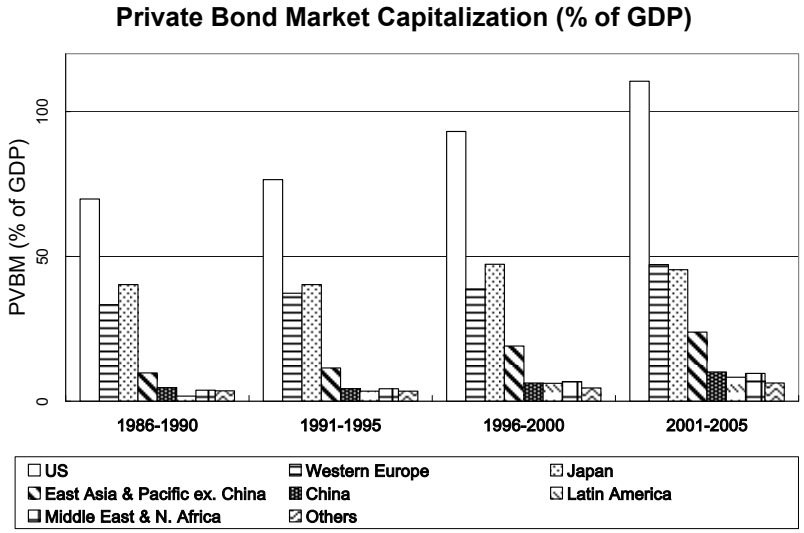


Figure 5: Public Bond Market Development

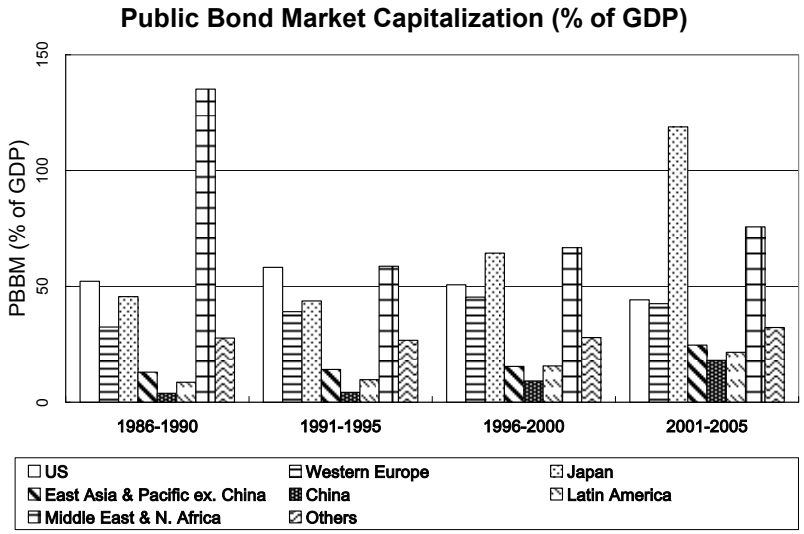


Figure 6: Legal and Institutional Development

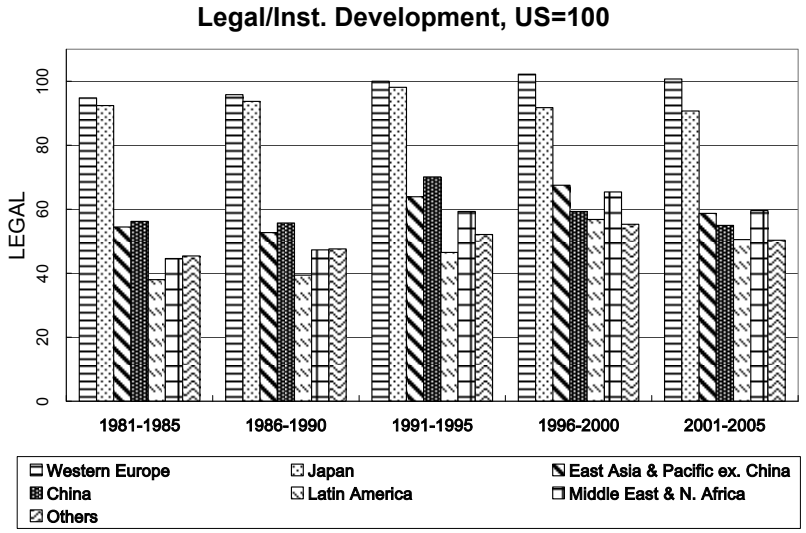


Figure 8: Comparison by "Financial Development Index"

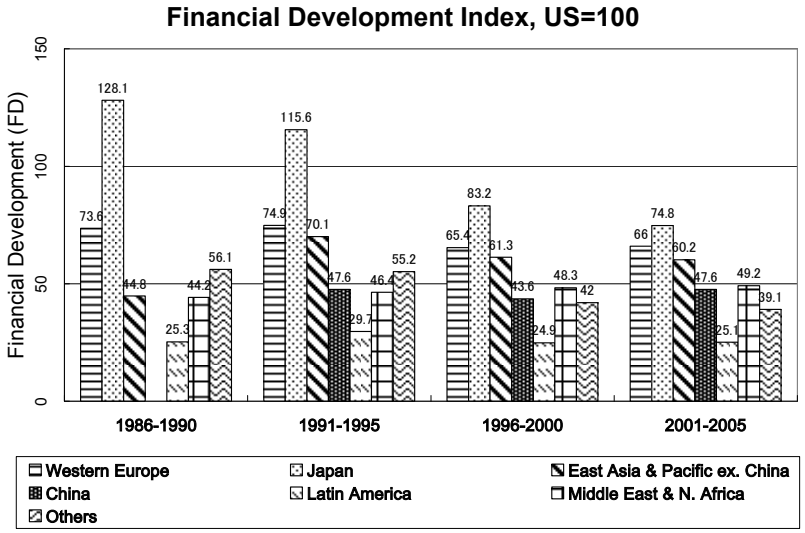


Figure 7: Financial Openness by Region

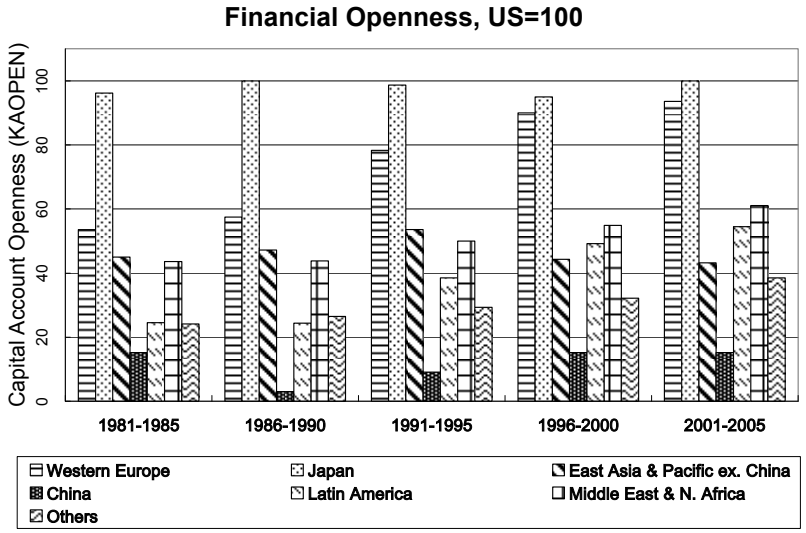


Figure 9: "Adjusted" Financial Market Size

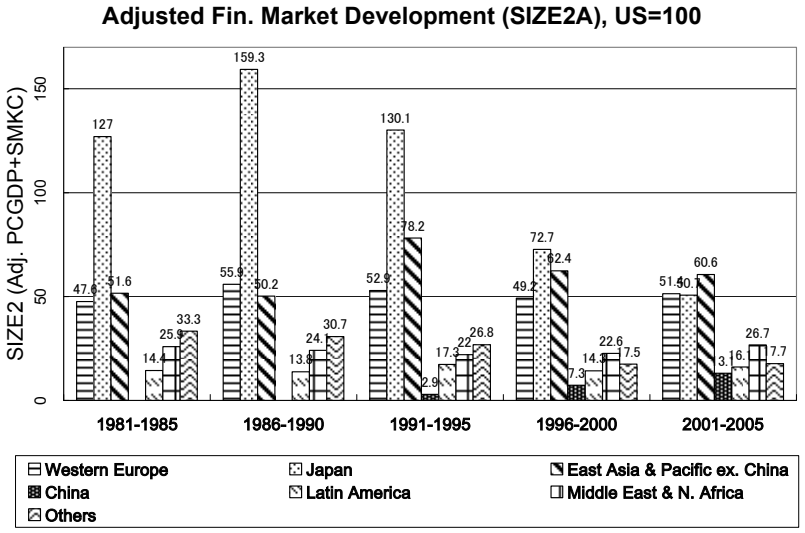
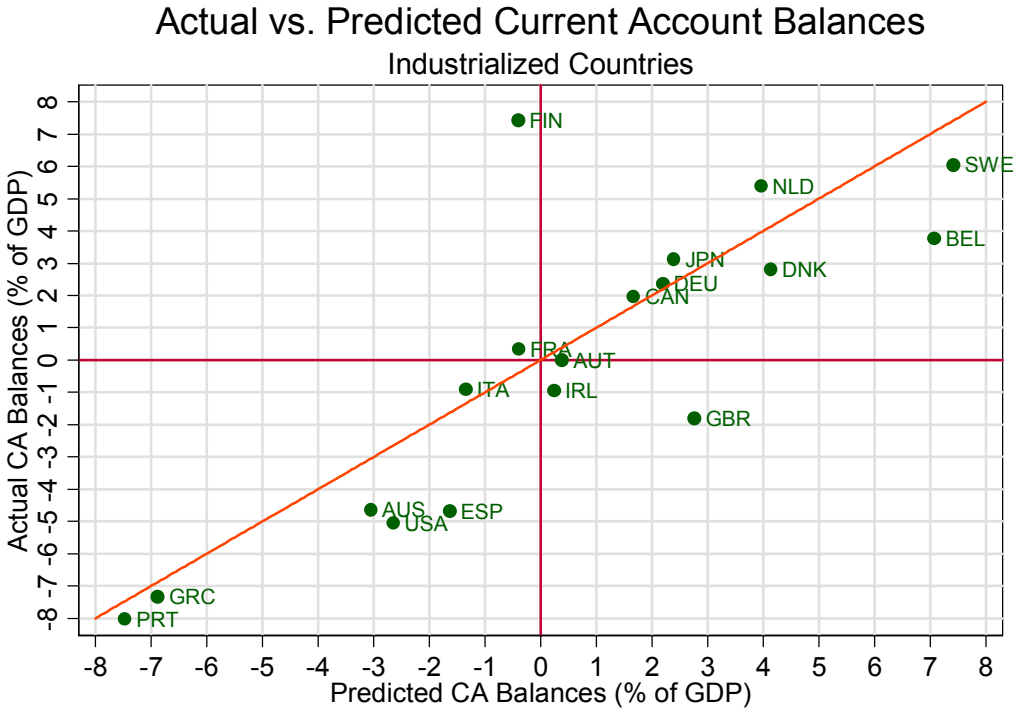


Figure 10: Actual Current Account Balances and In-Sample Predictions

(A) Industrialized Countries



(B) Emerging Market Countries

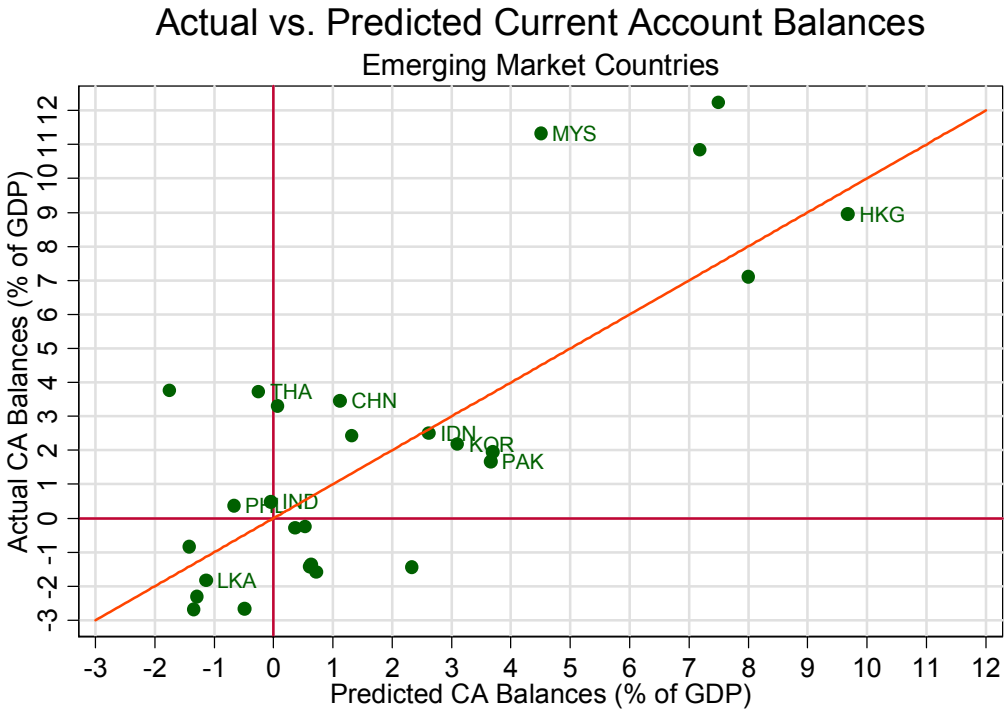
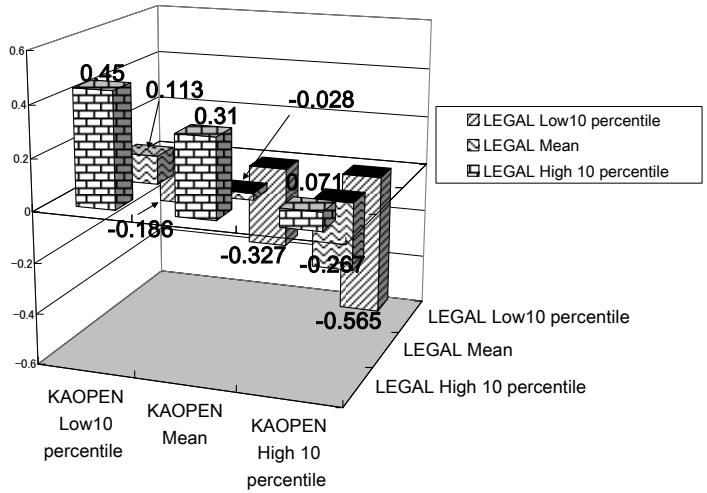
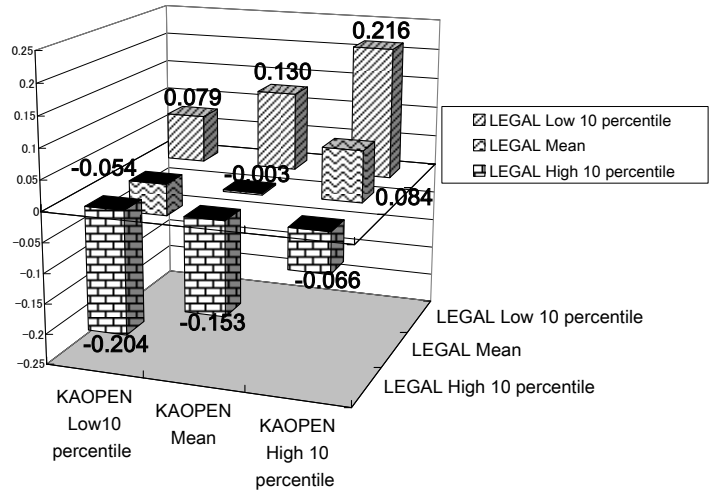


Figure 11: Total Effect of Financial Development for Emerging Market Countries

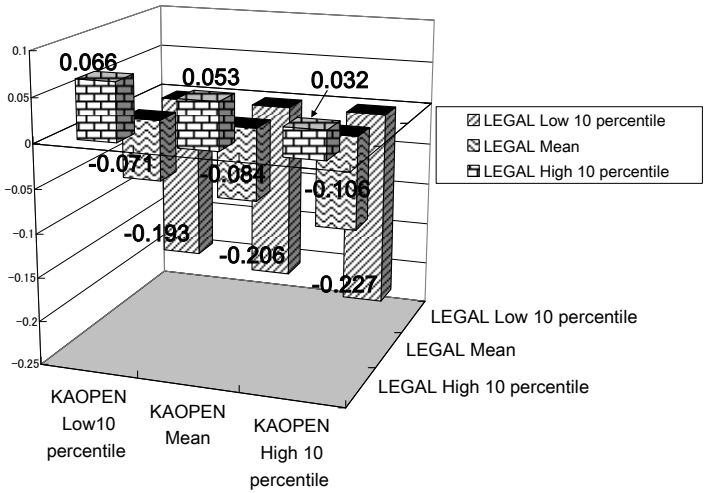
A: On Current Account Balances



C: On Investment



B: On National Saving



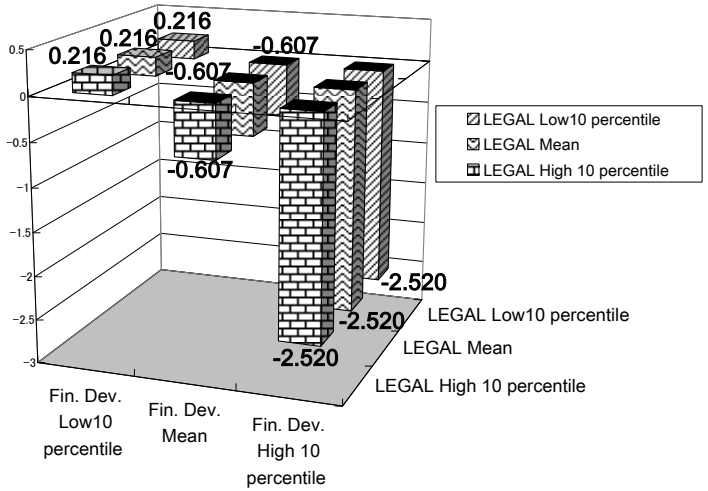
D: Matrix for Emerging Asia

		KAOPEN		
		Low 10 percentile	Mean	High 10 percentile
LEGAL	Low 10 percentile	Bangladesh	Indonesia, Philippines, Sri Lanka	
	Mean	China	India, Korea, Malaysia, Thailand, ex-China EA	
	High 10 percentile			Hong Kong, Singapore

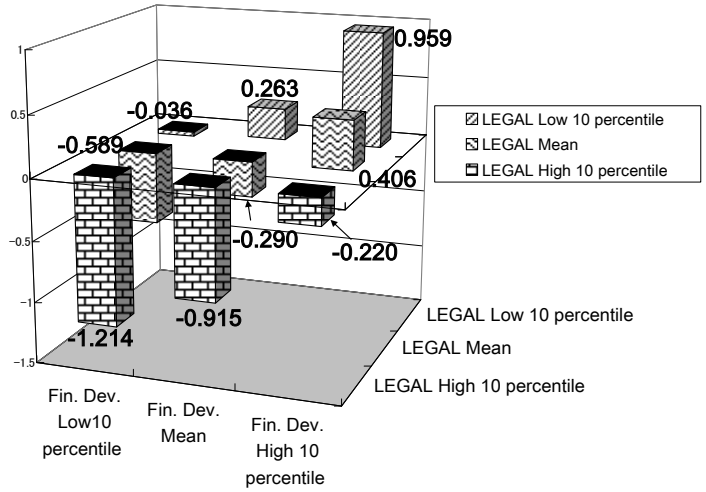
NOTE: The mean and 10 and 90 percentiles of *LEGAL* and *KAOPEN* used for calculation are based on the data of the 1996-2000 and 2001-05 periods.

Figure 12: Total Effect of Financial Liberalization for Emerging Market Countries

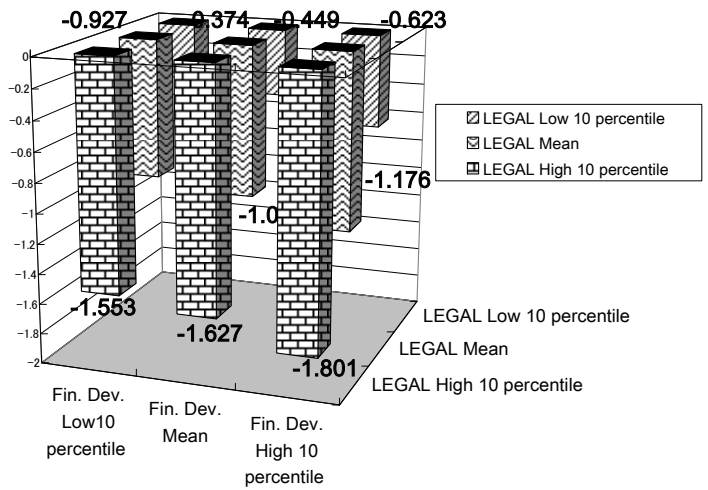
A: On Current Account Balances



C: On Investment



B: On National Saving



D: Ranking of Financial Openness for Emerging Asia

Country	KAOPEN [0, 4.37]
Hong Kong	4.37
Singapore	4.37
Indonesia	2.99
Philippines	1.95
Korea	1.71
Malaysia	1.71
Thailand	1.71
China	0.66

NOTE: The mean and 10 and 90 percentiles of *LEGAL* and *SIZE* used for calculation are based on the data of the 1996-2000 and 2001-05 periods. *KAOPEN* ranges [0, 4.37]. For the construction of *KAOPEN*, refer to the text and Chinn and Ito (2007).