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Interlocking directorates among these institutions also abound, facilitating access of real estate companies to bank loans. Thus, the problem that arises in the Asian banking system is quite different from that described by the model. Imprudent lending to subsidiaries, affiliates, and bank directors and officers appears to be a serious problem. The solution, therefore, which many countries in the region have attempted to do in the aftermath of the financial crisis, is to strengthen banking regulations including capacities of regulators and corporate governance of banks. A strong banking sector closely monitored by regulators can fare better in times of real estate market downturn.

There are some nuances in developing mortgage securitization in Asia. In the model, P denotes the price of land for development. However, valuation of real estate properties is still a big problem in Asia. It is not unusual to find two significantly different valuations of the same property given by two real estate appraisers. Also, benchmark yield curve is not yet firmly established in Asia, making it difficult to develop the securities market rapidly.

Turning to the empirical analysis made by the authors, the sample appears to be too small to generate enough confidence in the results. More studies of this nature using a larger sample are, therefore, called for.

4

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

Hiro Ito and Menzie Chinn

4.1 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 to shrink?

These imbalances are large. The U.S. deficit was 6.5 percent of gross domestic product (GDP) while China's surplus was 9.1 percent, with balances in the next two years projected at 10 percent. The rest of the developing Asian region is running an average current account surplus of 5.4 percent.[1] Finally, the sustained elevation in oil prices has added oil exporters to the list of surplus countries. Figure 4.1 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,

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

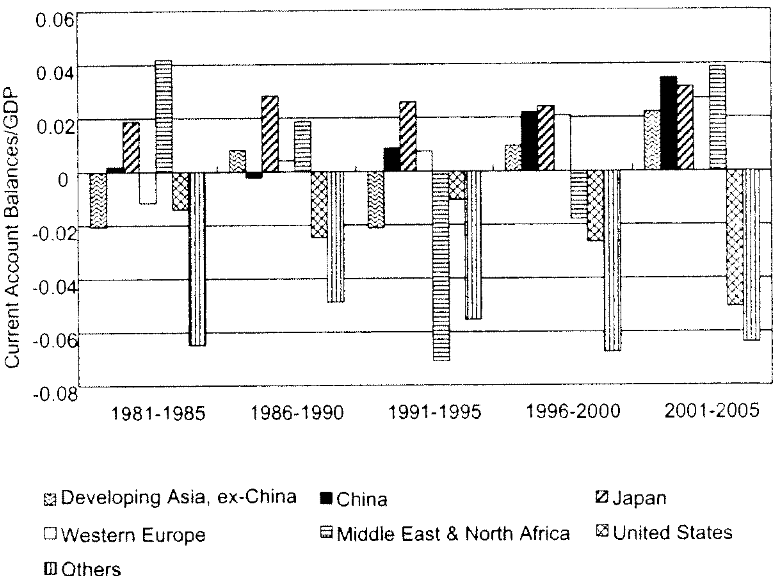


Fig. 4.1 Current account balances by region (percentage of GDP)

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 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 eighty-nine countries over the 1971 to 2004 period, we found that more financial development leads to *higher* saving for countries with underdevelopment institutions and closed financial markets, which includes most East Asian emerging market countries.[3]

This chapter 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, Demirgüc-Kunt, and Levine 2001). Chinn and Ito (2007a) used private credit creation (as a 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 chapter, 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, Kalemi-Ozcan, and Volosovych (2003), on the other hand, show that institutional development may explain the Lucas paradox, that is, 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 data set composed of nineteen industrialized countries (IDCs) and seventy 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.

2. Theoretical explanations for this phenomenon now abound. See Caballero, Emmanuel, and Pierre-Olivier (2006) and Mendoza, Quandrini, and Rios-Rull (2006).

3. Among East Asian countries, most 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.

To anticipate our results, we find the following. First, we confirm a role for budget balances in IDCs 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 IDCs, 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 chapter is organized as follows. Section 4.2 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 4.3 details the empirical methodology and results. Section 4.4 draws out the policy implications; section 4.5 concludes.

4.2 Financial and Institutional Development and the Global Saving Glut

4.2.1 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 principle 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. Conceptually, financial development is the process of increasing efficiency in the channeling of funds from providers of capital to users of capital. In the end, the capital should be directed to activities that have the highest rate of return with the least amount of risk. Financial development might incorporate the use of new information technologies, the establishment of organized exchanges, and the other physical trappings of financial activities. But more fundamentally, it involves the reduction of information acquisition and transaction costs, overcoming or managing information asymmetries, and improving corporate governance.[4] Clearly, financial development should then have implications for both saving and investment behavior.

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."

Unfortunately, the available metrics by which the progress of financial development can be tracked are less than fully ideal. We measure the process by tabulating the size and activity of the banking sector, stock, bond, and insurance markets, with an understanding of the limitations of such indicators.

While the effect of financial development on investment is relatively unambiguous (i.e., positive), that on saving is not because 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, 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 United States. Similarly, Dooley,

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 chapter 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.

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.

Folkerts-Landau, and Garber (2005) argue that, in the absence of a well-functioning domestic 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 the 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, Loayza, and Beck (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 foreign residents will also be affected.[8]

4.2.2 Stylized Facts: Financial Development, Openness, and Institutions

Figure 4.2 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] Throughout the period, most markets, notably the U.S., Western European, and Chinese markets (relative to GDP), have steadily grown. The exceptions are the Japanese and ex-China East Asian financial markets, which experienced some retrenchment after the bursting of the bubble at the end of the 1980s and the financial crisis of 1997 to 1998, 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 percent of those of the United States, and those of East Asian and Chinese markets are about half of the U.S. financial markets.[10]

7. See also Beck and Levine (2005), Johnson, McMillan, and Woodruff (2002), and Levine (2005), among others.

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 data set created and subsequently updated by Beck, Demirgüc-Kunt, and Levine (2001). Demirgüc-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, because we want to focus on the private-sector development of financial markets that is more in line with financial development in a real sense, we use private credit creation instead.

10. 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 4.2. 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 percent), other East Asian countries are, on average, equipped with more developed equity markets (its relative size is about 81 percent).

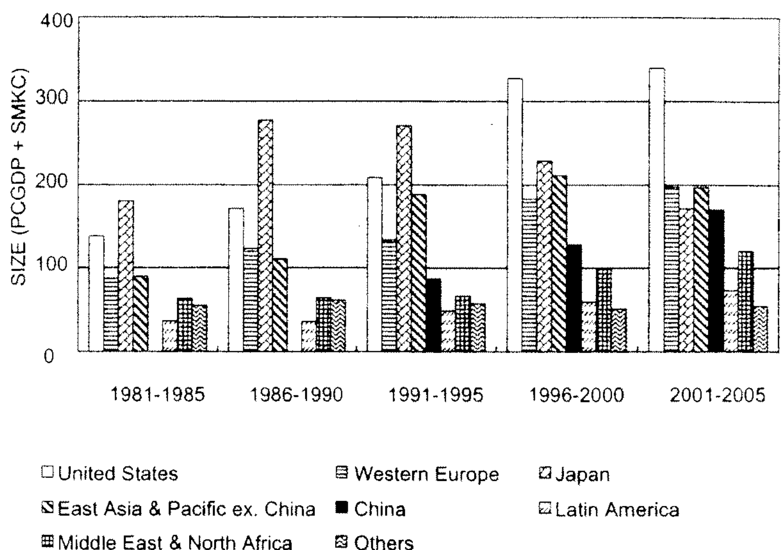


Fig. 4.2 Financial market development (size)

Beck, Demirgüe-Kunt, and Levine (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, with little 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 4.3 compares SMTV across different countries and regions. Also in this figure, we can make the same generalizations as we did in figure 4.2. 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 percent of U.S. stock market total value (as a ratio to GDP).[11] This is clear evidence that U.S. stock markets are far more liquid than those in other regions and countries.

Figure 4.4 shows that the characterization of U.S. capital markets ex-

11. 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 to 1995 and 1996 to 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.

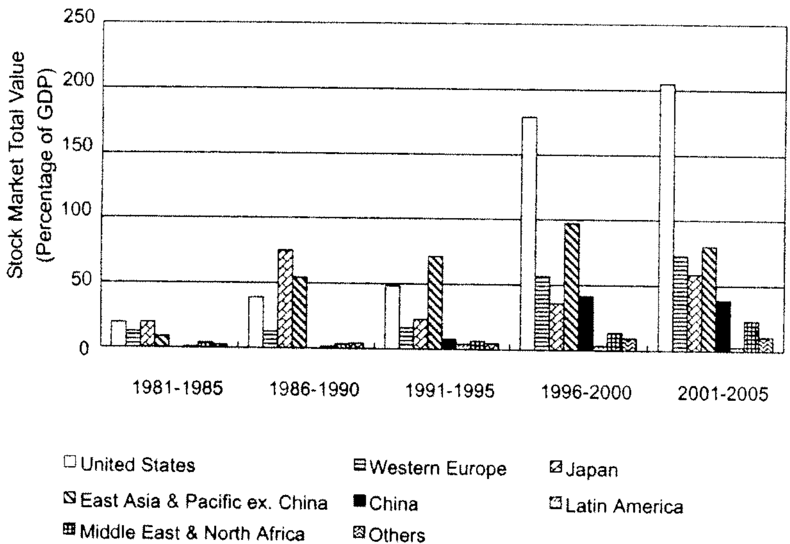


Fig. 4.3 Financial market development (activeness)

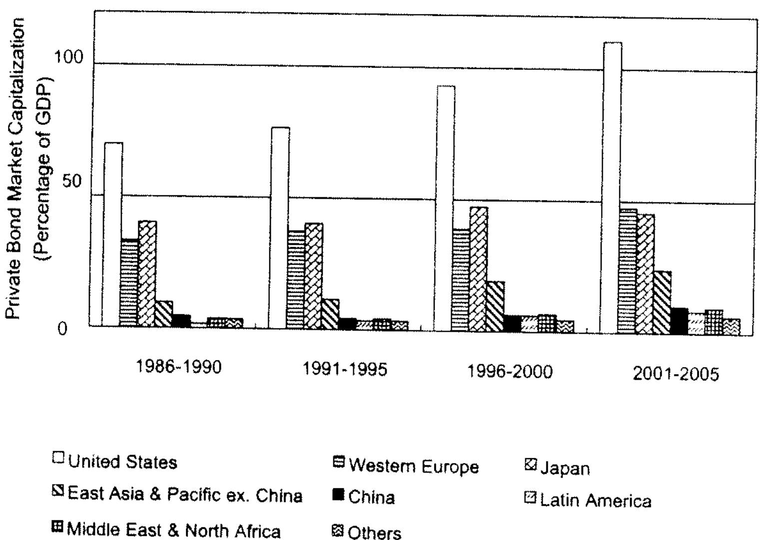


Fig. 4.4 Private bond market development

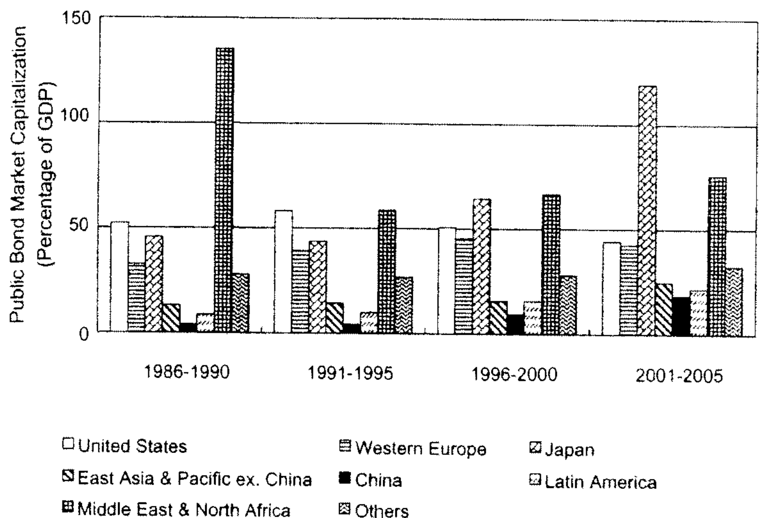


Fig. 4.5 Public bond market development

tends to private bond markets.[12] Even the private bond markets of Western European countries and Japan are less than half of U.S. counterparts, and only 22 percent and 9 percent 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 4.5. 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.[13]

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), and bureaucracy quality (BQ).[14] Figure 4.6 compares the level of legal and institutional development of different regions and countries with the United States, whose value is normalized as 100. As one can expect, Western Europe and Japan have

12. The variables for private and public bond market capitalization (PVBM and PBBM, respectively) are only available after 1990 and for IDCs and emerging market countries.

13. 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 the data appendix.

14. 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.

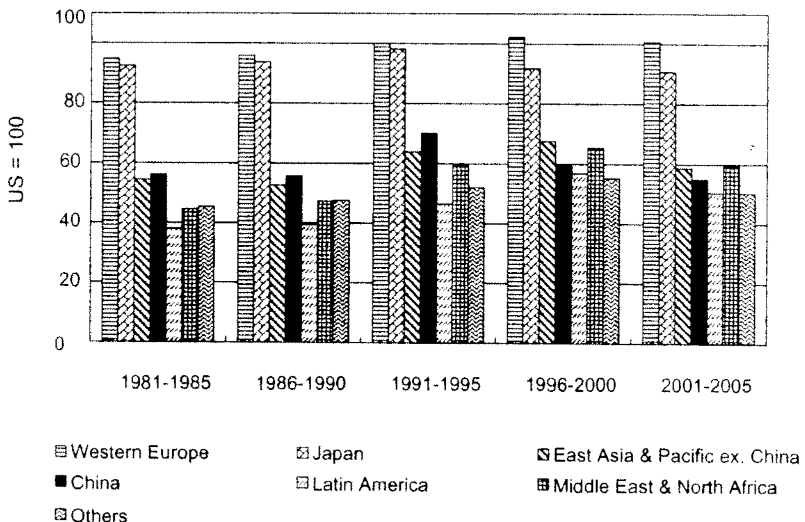


Fig. 4.6 Legal and institutional development

achieved levels of legal and institutional development comparable to the United States. The other regions lag the developed countries; their relative levels of legal and institutional development are about 60 percent at most.

The degree of financial openness is compared in figure 4.7 using the Chinn-Ito capital account openness index (KAOPEN). This index is based upon the International Monetary Fund's (IMF) 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.[15] Like the LEGAL variable, financial openness is compared relatively to the United States. 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 preceding 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. persis-

15. More details about the data are found in Chinn and Ito (2007b).

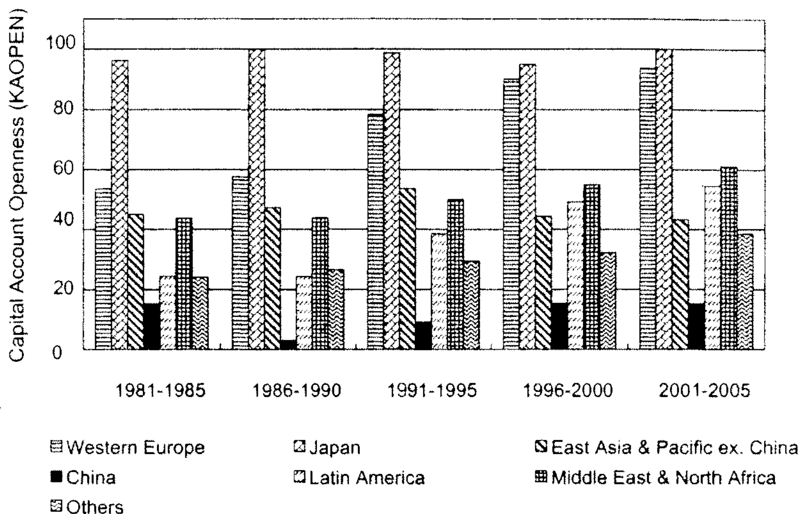


Fig. 4.7 Financial openness by region

tent demand to China for further financial opening. In the following, we will examine the effects of further development in financial markets and legal systems with an eye to drawing out the implications of further opening of financial markets in East Asian emerging market countries.

4.3 Empirics

4.3.1 Specification and Estimation

We estimate regressions of the general form:

$$(1) \quad y_{i,t} = \alpha + \beta_1 FD_{i,t} + \beta_2 LEGAL_{i,t} + \beta_3 KAOPEN_{i,t} + \beta_4 (FD_{i,t} \times LEGAL_{i,t}) + \beta_5 (LEGAL_{i,t} \times KAOPEN_{i,t}) + \beta_6 (KAOPEN_{i,t} \times FD_{i,t}) + \mathbf{X}_{i,t}\Gamma + u_{i,t},$$

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 United States); its quadratic term; relative dependency ratios on young 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 nineteen industrial and seventy developing countries covering the last twenty-year period, 1986 to 2005.

For our empirical analysis, we use a panel that contains nonoverlapping five-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.[16] 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 preceding arguments have made clear, it is important to examine not only the effects of each of these variables, 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 current account balances.[17]

16. 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).

17. 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. 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.

4.3.2 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. Because 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.[18]

Table 4.1 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 1 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 IDCs and a slightly smaller effect for developing country groups, though none of them are statistically significant (with its p-value being 15 percent for IDCs and ranging from 12 percent to 17 percent for developing country groups).

This result differs from the results obtained in Chinn and Ito (2007a), where a 1 percentage point increase in the budget balance would lead to a 0.15 percentage point increase in the current account balance for IDCs and slightly higher results for developing country groups. The differing results are ascribable to the use of a different measure of financial development—private credit—and a longer sample period.[19]

SIZE exhibits a negative coefficient only in the IDCs, while its interaction with LEGAL is significantly positive for ex-Africa less-developed country (LDC) and emerging market country (EMG) groups, and its interaction with KAOPEN is significantly positive for IDCs and significantly negative for developing and emerging market countries. This finding indicates that, for IDCs, 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 IDC'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

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

19. Also the LEGAL variable was included as a time-invariant variable.

Table 4.1 Current account regressions with the SIZE variable

	IDC (1)	LDC (2)	LDC without Africa (3)	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 development (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 × LEGAL	0.014	0.015	0.013	0.019
	(0.012)	(0.006)**	(0.008)[11%]	(0.007)***
Financial openness (KAOPEN)	0.016	–0.013	–0.014	–0.014
	(0.012)	(0.006)**	(0.008)*	(0.007)**
KAOPEN × LEGAL	0.01	0.001	0.001	0
	(0.008)	(0.002)	(0.002)	(0.002)
KAOPEN × 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]
Average 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]***
No. of observations	81	156	125	125
Adjusted R^2	0.52	0.55	0.52	0.59

Notes: IDC = industrialized countries; LDC = less-developed countries; EMG = emerging market. 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 parentheses. The estimated coefficients for the time-fixed dummies and constant are not shown.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

significant for financial development in any developing country grouping. LEGAL is marginally significant for LDC and ex-Africa LDC (its p-value being 12 percent and 13 percent, 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 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. In the following, 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, 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.[20] 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 4.1 demonstrates that the current account balances of "Middle East and North 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 IDCs 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

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

ran regressions 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 4.1 (results not reported).[21] 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 4.1. 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.

4.3.3 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.[22] Because 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.[23] We invert this series (INVNETINT) and use it as a measure of market competitiveness of financial markets.[24] We reestimate the equation (1) model using these two variables. Also, because one can expect that market efficiency might affect international investors in a manner dependent upon market openness, we also include an interactive term between INVNETINT and KAOPEN.[25]

The results shown in table 4.2 are promising.[26] 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 IDCs and positive for developing country groups.[27]

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, in-

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

22. 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 because it is normalized by the market size, not the size of the economy. However, because the estimation model already controls for the size of financial markets, SMTO can be a useful indicator of market activeness.

23. The rationale for the use of this variable as the measure of banking market efficiency is that low net interest margin for a country means that banks in that country generally cannot reply too much on interest revenue, which implies that banks must compete in a more competitive market with low operating costs and low profitability. Beck, Demirgüc-Kunt, and Levine's (2001) financial structure data set also contains overhead costs (OVERHEAD) as another variable to measure market efficiency for the banking sector. Our empirical results are qualitatively unaffected when we use OVERHEAD instead of NETINT.

24. Originally, a higher value of NETINT indicates more interest rate margin, that is, 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.

25. The following results are generally unchanged if we use OVERHEAD banks' overhead costs as a share of their total assets, instead of INVNETINT.

26. To conserve space in table 4.2, we report the results only for the variables of interest. Complete results are available from the authors upon request.

Table 4.2 **Current account regressions with the SIZE, SMTO, and NETINT variables**

	IDC (1)	LDC (2)	LDC without Africa (3)	EMG (4)
Government budget balance	0.187	0.228	0.231	0.237
	(0.191)	(0.113)**	(0.152)	(0.126)*
Financial development (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)
INVNETINT × KAOPEN	0.809	0.042	0.081	0.018
	(0.367)**	(0.066)	(0.076)	(0.062)
Legal/institutional development (LEGAL)	0.025	0.031	0.032	0.032
	(0.011)**	(0.009)***	(0.012)***	(0.009)***
SIZE × 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 × LEGAL	0.002	0	0.002	0
	(0.008)	(0.002)	(0.002)	(0.002)
KAOPEN × 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)***
No. of observations	77	140	114	112
Adjusted R^2	0.56	0.63	0.58	0.65

Notes: IDC = industrialized countries; LDC = less-developed countries; EMG = emerging market. 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 parentheses. The estimated coefficients for relative income, its quadratic term, young dependency ratio, old dependency ratio, terms of trade (TOT) volatility, output growth, trade openness, the time-fixed dummies and constant are not shown.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

27. The magnitude and statistical significance for the oil exporter dummy increases as well.

stead of importers, contrary to the saving glut thesis or Dooley, Folkerts-Landau, and Garber's (2005) 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 IDCs, 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 IDC with more competitive, but less open, financial markets tends to have 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 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.[28]

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.

4.3.4 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 nonoverlapping, 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 two-stage least squares (2SLS) analysis by instrumenting the SIZE variable with some variables that can be the determinants of financial development. Boyd, Levine, and Smith (2001) show that inflation significantly negatively affects both the banking-sector development and equity market activity. La Porta

28. The results found in this exercise are robust when the United States is removed from the IDC group and also when China is removed from the EMG group.

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.[29]

The instrumental variables regression analysis yielded qualitatively similar results to those obtained before. In general, the estimation results are slightly weaker for the IDC 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 4.1 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 reestimate 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 4.8 compares regions using this financial development index while normalizing the index of the United States as 100. The historical patterns of financial development are similar to those displayed in figure 4.2. However, the underperformance of developing countries' financial markets as well as the U.S. relative strength appear more distinct, reflecting that developing countries lag behind in bond and life insurance markets.

We repeat the exercise in table 4.1, using the composite index in place of SIZE.[30] Interestingly, the estimated coefficients in the current account regressions becomes more significant for developing country groups, but not so for the regressions involving the IDC group. For the LDC groups, all the variables of our interest except for the interaction between KAOPEN and LEGAL become more than 5 percent significant.[31] We also conduct the 2SLS analysis by instrumenting in the same way as described in the preceding. Although the estimated coefficient for the composite index be-

29. 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.

30. 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.

31. The coefficient estimates in the national saving regression become more significant for the IDCs, 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.

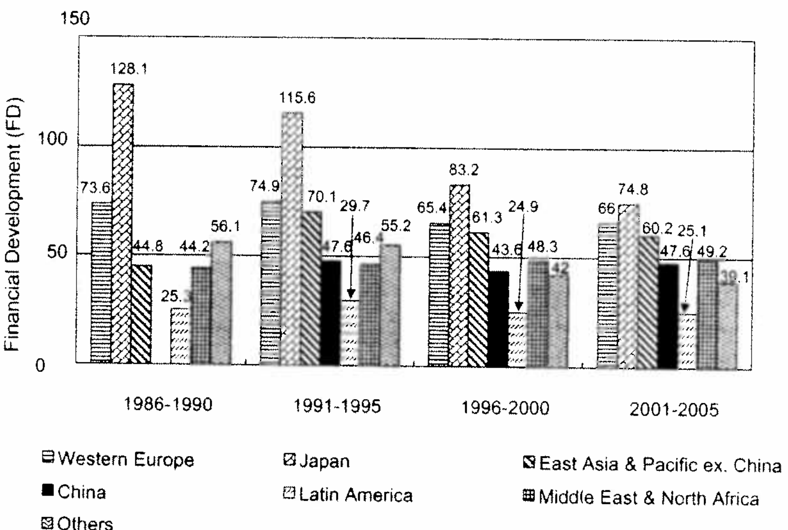


Fig. 4.8 Comparison by "financial development index"

comes 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, Harvey, and Lundblad (2006). Specifically, we take the La Porta, Lopez-de-Silanes, and Shleifer (2002) estimates of the ratios of government ownership of banks, and interpolate data over our sample period.[32] PCGDP is then multiplied by (1 minus the ratio of government ownership of banks). Using this "adjusted" PCGDP, we reconstruct the SIZE variable (SIZE2A).

The SIZE2A series are compared across different regions and with the

32. La Porta, Lopez-de-Silanes, and Shleifer (2002) provide the estimates of the ratios of government ownership of banks for ninety-two developed and developing countries for 1970 and 1995. Bekaert, Harvey, and Lundblad (2006) use La Porta, Lopez-de-Silanes, and Shleifer'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.

United States in figure 4.9. The effect of the adjustment for government ownership of banks is striking for developing countries. In the 2001 to 2005 period, the size of financial markets for China, Latin America, and other countries is less than 20 percent of the United States. In fact, China's size of financial markets is merely 13.1 percent of the United States, confirming that China still has a long road to financial development.

Last, we reestimate 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 4.1 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 4.1 and 4.2.

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 to 1998 period as one characterized as crisis years, we

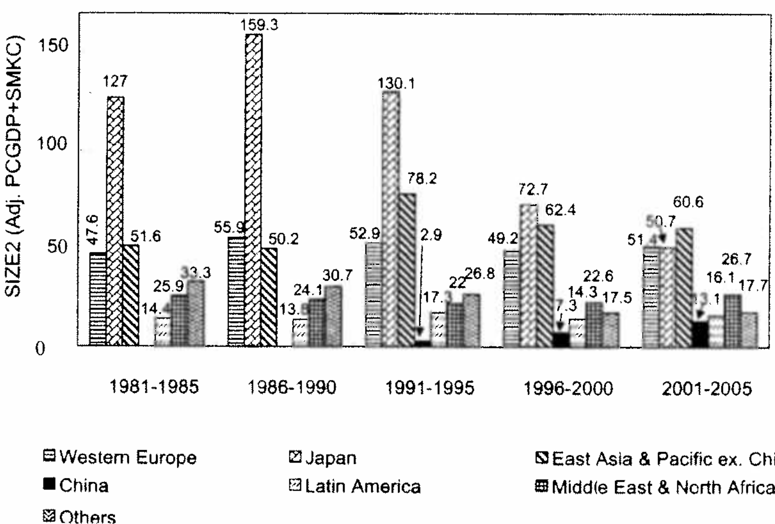


Fig. 4.9 "Adjusted" financial market size

reconstruct the five-year panels to exclude this period and reestimate 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 nonoil 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 nonoil 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.

4.4 Policy Implications

One question that immediately arises is whether one should be surprised at the current set of global imbalances, given the estimates reported in the preceding. Figure 4.10 displays both actual and predicted current account balances for the IDC group (panel A) and the emerging market group (panel B). In panel A, we can see that the United States is one of the countries that experienced a larger current account deficit than predicted by the model.[33] 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.[34]

4.4.1 The Effects of Financial Development and Financial Opening for Emerging Asia

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.

Panels A, B, and C in figure 4.11 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

33. 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.

34. The prediction errors shown in figure 4.10 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 chapter. Refer to Clarida (2007) for a debate regarding the issue of current account sustainability.

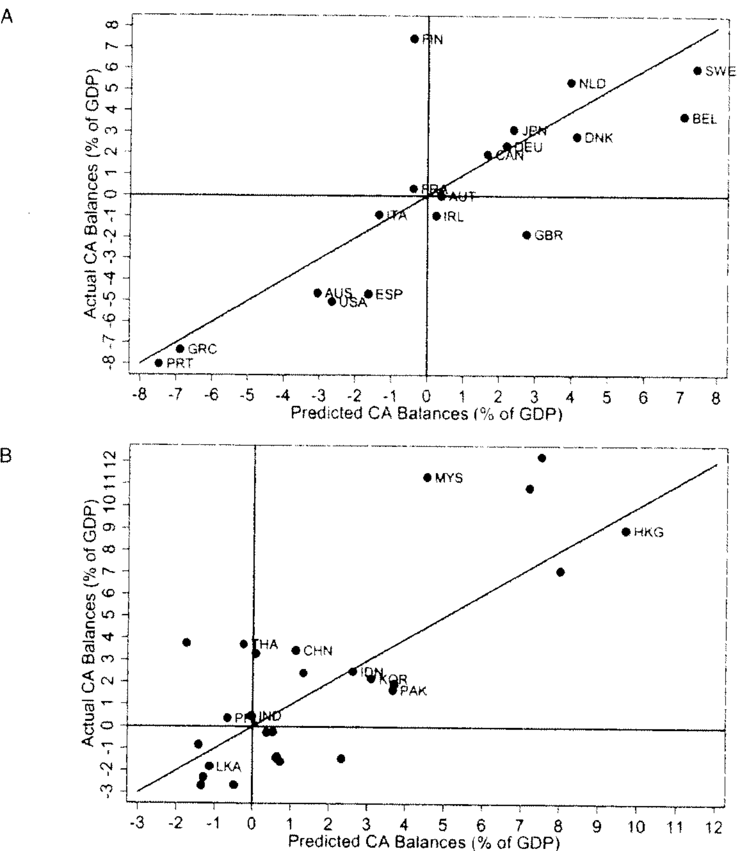
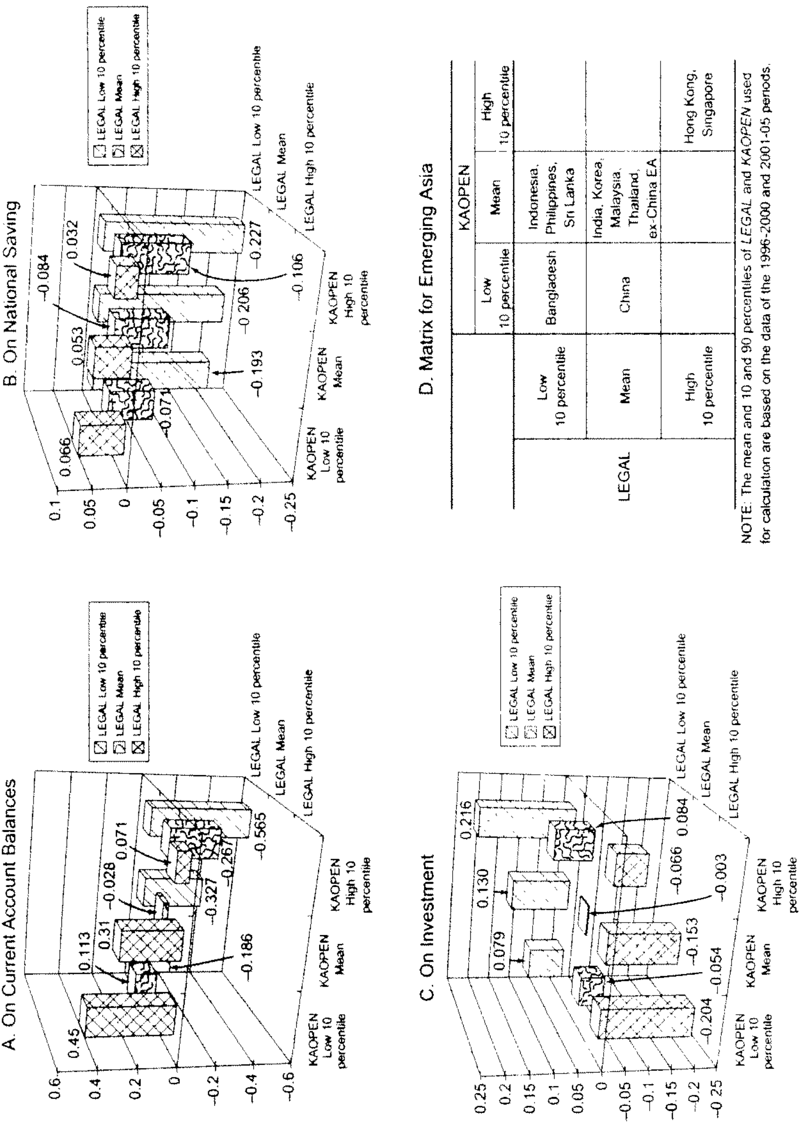


Fig. 4.10 Actual current account balances and in-sample predictions: *A*, Industrialized countries; *B*, Emerging market countries

10 percentage points above the world weighted average conditional on the levels of LEGAL and KAOPEN for emerging market countries.[35] The calculation is made based on the regression results shown in column (4) of table 4.2 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

35. Between the 1996 to 2000 and 2001 to 2005 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 increase is not too unrealistic. This calculation holds other variables constant, including the level of stock market activeness (SMTO) and market efficiency (INVNETINT).



		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

Fig. 4.11 Total effect of financial development for emerging market countries: *A*, On current account balances; *B*, On national saving; *C*, On investment; *D*, Matrix for emerging Asia

Note: The mean and 10th and 90th percentiles of LEGAL and KAOPEN used for calculation are based on the data of the 1996 to 2000 and 2001 to 2005 periods.

of these two variables. For example, panel A shows that a 10 percentage 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 10th percentile (i.e., the bar at the northwest corner on the floor) to lower its current account as a ratio to GDP by 0.186 percentage points. Examining the bars at the same location in the other two panels allows us to determine whether the effect of such 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.[36] Second, due to differing data 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 4.11 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 10th percentile legal development and highest 10th 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

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

would occur in the event of capital account liberalization. Figure 4.12 presents a parallel analysis to what we did in figure 4.11, but this time, we examine the total effect of financial opening, a one unit increase in KAOPEN, 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.

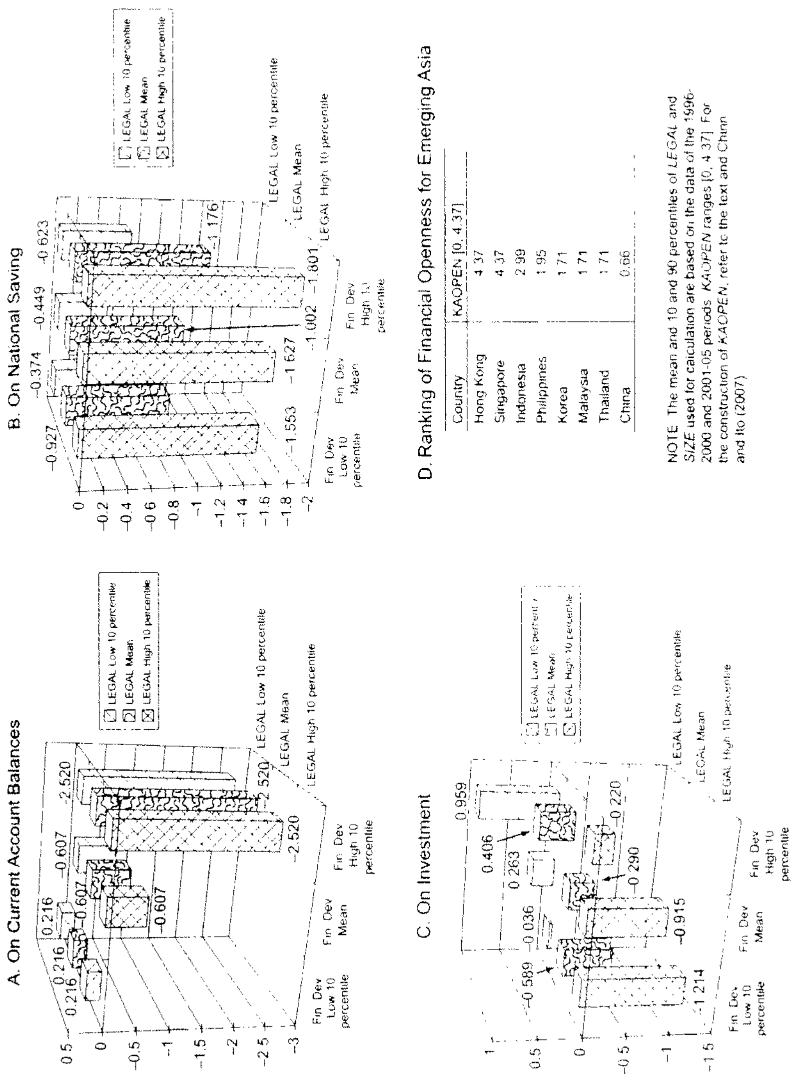
Panel A of figure 4.12 indicates that financial opening, holding the levels of both legal and financial development constant, would result in a typical emerging market economy experiencing a deteriorating current account balances, except when the economy is financially underdeveloped. Panels B and C 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 1 percentage point decline. Considering that the size of current account surplus for the 2001 to 2005 period is 3.5 percent, this is not a nontrivial 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.

4.4.2 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 United States. The observation that the United States attracts capital from the rest of the world because of its deep and sophisticated financial markets has become something of a cliché. 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



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).

Fig. 4.12 Total effect of financial liberalization for emerging market countries: *A*, On current account balances; *B*, On national saving; *C*, On investment; *D*, Ranking of financial openness for emerging Asia

Notes: The mean and 10th and 90th percentiles of LEGAL and SIZE used for calculation are based on the data of the 1996 to 2000 and 2001 to 2005 periods. KAOPEN ranges [0, 4.37]. For the construction of KAOPEN, refer to the text and Chinn and Ito (2007).

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 reexamine the magnifier effect with reference to the link between the budget and current account balances.

Table 4.3 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, that is, 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.[37] Because 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 IDC 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 borrow abroad to finance their budgetary programs. Using the actual five-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 to 0.49 found in Chinn and Ito (2007a).

As was shown in figure 4.5, 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 reestimated 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 IDCs remains significant, and its magnitude is still high, 0.48 (the p-value for the interaction term is now 22 percent). At the very least, budget balances seem to play an important role for current account balances for IDCs.

37. We also include a dummy for Japan because, as figure 4.5 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.

Table 4.3 The impact of public bond market development in current account regressions

	IDC (1)	EMG (2)	IDC (3)	EMG (4)	Debtor IDC (5)	Debtor EMG (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 × 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 market development (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 development (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 × KAOPEN			−0.395	0.226	−0.327	0.208
			(0.493)	(0.083)***	(0.518)	(0.108)*
Legal/institutional 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 × 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	−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 × 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 × 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)**
No. of observations	80	72	76	65	55	58
Adjusted R^2	0.65	0.60	0.71	0.77	0.63	0.49

Notes: See table 4.2 notes. There are no oil exporting countries in any of the subsamples.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

4.5 Concluding Remarks

In this chapter, 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 finan-

cial 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, 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 IDC 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 1 percentage point improvement in the budget balance can lead to about half a percentage point improvement in current account balances for IDCs. 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, greater financial openness leads to a deterioration of the current account, in a manner consistent with some aspects of the saving glut hypothesis. 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 chapter were drawn from a number of different sources. In the following, we provide 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 chapter. For most countries, data were available from 1971 through 2005.

Table 4A.1 **Data**

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 purchasing power parity (PPP) exchange rates, measured relative to the United States, range (0 to 1)
RELDEPY	WDI	Youth dependency ratio, population under fifteen/ population between fifteen and sixty-five
RELDEPO	WDI	Old dependency ratio, population over sixty-five/ population between fifteen and sixty-five
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' calculations	Financial market development in terms of its size, PCGDP + SMKC
PCGDP	BDL	Private credit creation as a ratio to GDP

(continued)

Table 4A.1 (continued)

Mnemonic	Source	Variable description
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' calculations	General level of financial development, first principal component of PCGDP, SMKC, SMTV, PVBM, PBBM, INVNETINT, and LIFEINS
SIZE2A	BDL, Authors' calculations	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.

Sources: 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., S. Kalemli-Ozcan, and V. Volosovych. 2003. Why doesn't capital flow from rich to poor countries? An empirical investigation. University of Houston. Unpublished Manuscript.

Bailliu, J. N. 2000. Private capital flows, financial development, and economic growth in developing countries. Bank of Canada Working Paper no. 00-15. Ottawa: Bank of Canada.

Beck, T., A. Demirgüc-Kunt, and R. Levine. 2001. A new database on financial development and structure. In *Financial structure and economic growth: A cross-country comparison of banks, markets, and development*, ed. A. Demirgüc-Kunt and R. Levine. Cambridge, MA: MIT Press.

Beck, T., and R. Levine. 2005. Legal institutions and financial development. In *Handbook of New Institutional Economics*, ed. C. Menard and M. Shirley, 251–78. Dordrecht, The Netherlands: Kluwer.

Bekaert, G., C. R. Harvey, and C. Lundblad. 2006. Financial openness and the Chinese growth experience. Columbia University. Mimeograph.

Bernanke, B. 2005. The global saving glut and the U.S. current account. Remarks at the Sandridge lecture, Virginia Association of Economics, Richmond, Virginia.

Boyd, J. H., R. Levine, and B. D. Smith. 2001. The impact of inflation on financial sector performance. *Journal of Monetary Economics* 47:221–48.

Caballero, R., F. Emmanuel, and G. Pierre-Olivier, 2006. An equilibrium model of global imbalances and low interest rates. NBER Working Paper no. 11996. Cambridge, MA: National Bureau of Economic Research.

Chinn, M., and H. Ito. 2006. What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics* 82:163–92.

———. 2007a. Current account balances, financial development and institutions: Assaying the world "savings glut." *Journal of International Money and Finance* 26 (4): 546–69.

———. 2007b. A new measure of financial openness. University of Wisconsin. Mimeograph.

Chinn, M., and J. Lee. 2006. Current account and real exchange rate dynamics in the G-7 countries. *Journal of International Money and Finance* 25 (March): 257–74.

Chinn, M., and E. Prasad. 2003. Medium-term determinants of current accounts in industrial and developing countries: An empirical exploration. *Journal of International Economics* 59 (1): 47–76.

Clarida, R. 2005a. Japan, China, and the U.S. current account deficit. *CATO Journal* 25 1:111–14.

———. 2005b. Some thoughts on "The sustainability and adjustment of global current account imbalances." Speech given at the Council on Foreign Relations, Washington, DC.

Clarida, R. H., ed. 2007. *G7 current account imbalances: Sustainability and adjustment.* Cambridge, MA: National Bureau of Economic Research.

Demirgüc-Kunt, A., and R. Levine. 2001. Bank-based and market-based financial systems—Cross-country comparisons. In *Financial structure and economic growth: A cross-country comparison of banks, markets, and development*, ed. A. Demirgüc-Kunt and R. Levine, 81–140. Cambridge, MA: MIT Press.

Dooley, M., D. Folkerts-Landau, and P. Garber. 2005. *International financial stability: Asia, interest rates, and the dollar.* Frankfurt: Deutsche Bank Global Research.

Edwards, S. 1996. Why Are Latin America's saving rates so low: An international comparative analysis. *Journal of Development Economics* 51:5–44.

———. 2002. Does the current account matter?. In *Preventing currency crises in emerging markets*, ed. S. Edwards and J. A. Frankel, 21–76. Chicago: University of Chicago Press.

Feldstein, M., and C. Horioka. 1980. Domestic saving and international capital flows. *Economic Journal* 90:314–29.

Frankel, J., M. Dooley, and D. Mathieson. 1987. International capital mobility in developing countries vs. industrialized countries: What do saving-investment correlations tell us? *IMF Staff Papers* 34 (September): 503–30.

Gale, W., and P. Orszag. 2004. Budget deficits, national saving, and interest rates. *Brookings Papers on Economic Activity*, Issue no. 2:101–210. Washington, DC: Brookings Institution.

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

King, R. G., and R. Levine. 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108:717–38.

Kose, M. A., E. Prasad, K. Rogoff, and S. J. Wei. 2006. Financial globalization: A reappraisal. IMF Working Paper no. WP/06/189. Washington, DC: International Monetary Fund.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer. 2002. Government ownership of banks. *Journal of Finance* 57:265–301.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny. 1998. Law and finance. *Journal of Political Economy* 106 (6): 1113–55.

Lane, P., and G. M. Milesi-Ferretti. 2006. The external wealth of Nations Mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. IMF Working Paper no. WP/06/69. Washington, DC: International Monetary Fund.
Levine, R. 2005. Finance and growth: Theory and evidence. In *Handbook of economic growth*, P. Aghion and S. Durlauf, 865–934. Amsterdam: Elsevier Science.
Levine, R., N. Loayza, and T. Beck. 2000. Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics* 46:31–77.
Mendoza, E. G., V. Quadrini, and J.-V. Rios-Rull. 2006. Financial integration, financial deepness and global imbalances. Paper presented at the 7th Jacques Polak Annual Research conference, Washington, DC.
Obstfeld, M., and K. Rogoff. 1996. *Foundations of international macroeconomics.* Cambridge, MA: MIT Press.
Rajan, R. G., and L. Zingales. 1998. Financial dependence and growth. *American Economic Review* 88:559–86.
Tesar, L. 1995. Evaluating the gains from international risksharing. *Carnegie-Rochester Conference Series on Public Policy* 42:95–143.
Wurgler, J. 2000. Financial markets and the allocation of capital. *Journal of Financial Economics* 58:187–214.

Comment

Edwin Lai

My comments incorporate not just my discussion during the conference but also my reaction after reading the latest version of the chapter. This chapter is about financial development and current account balances. It looks at the effect of various aspects of financial development on current account (CA) balances and saving-investment determination. The chapter is mainly motivated by Bernanke's (2005) "global saving glut" hypothesis. The hypothesis can be briefly stated as follows:

1. The U.S. current account deficit is mainly determined by the low cost of borrowing made possible by the huge inflows of funds from emerging markets, such as China and the rest of East Asia.
2. Investment demand in the United States has been very strong (or the United States is an attractive destination for investment) in the last ten years or so because of its political stability, strong property rights, good regulatory environment, and strong performance in the equity market and later the property market (following the dot-com bubble burst).
3. The CA deficit has very little to do with the large budget deficit of the United States.
4. The U.S. current account deficit is determined by factors beyond the U.S. borders.

Bernanke thinks that the solution to this "unnatural" reversal of roles of the less-developed countries (LDCs) being lenders and developed countries (DCs) being borrowers is for emerging markets to improve their investment environments, macroeconomic stability, property rights, and financial liberalization.

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Essentially, the main point of Bernanke's (2005) speech was to explain the ballooning current account deficit of the United States in the years leading to 2005. The alternative hypothesis he focused on was the "twin deficit" hypothesis—the large current account deficit was a result of the large budget deficit.

The policy implications could not be more different. If the saving glut theory is correct, then the solution to the huge current account deficit of the United States is for emerging markets to liberalize financial sectors so that their citizens can invest their savings in domestic economies. This would possibly result in higher interest rates (or higher returns to investors) for savers and lower interest rates for borrowers (or lower cost of capital) in these countries. If the twin deficit hypothesis is correct, then the reduction of the humongous U.S. current account deficit requires a reduction of the budget deficit.

To facilitate discussion, let us write down the following simple identity:

$$CA = S - I + (T - G),$$

where CA = current account balance; S = domestic private saving; I = domestic private investment; T = tax revenue; G = government purchases. Suppose the country under discussion is the United States. Obviously, if $T - G$ is relatively stable over time, then the ballooning CA deficit cannot be due to changes in budget deficit. It must be due to a much faster increase in I relatively to that of S. On the contrary, if changes in $T - G$ more or less mirrored changes in CA, then the twin deficit hypothesis cannot be rejected.

My view of the saving glut hypothesis is that it comprises three parts. First, twin deficit hypothesis does not explain the huge current account deficit of the United States in recent years. Instead, the CA deficit must be explained by large increase in I relative to that of S in recent years. Second, the large increase in I in the United States was made possible by large influx of funds from emerging markets, whose financial development is relatively weak. Third, financial liberalization in these emerging markets can reduce the outflows of funds from these countries and, therefore, diminish this global saving glut. This will in turn help to reduce the CA deficit of the United States as cheap funds are not as easily available from overseas as before. Let us deal with each part one by one.

For the first part of the hypothesis, if one examines the data on current account balance of the United States in recent years (see table 4C.1) and compare them with data on government budget balance of the United States during the same period (see table 4C.2), one can see that the CA balance continued to deteriorate despite the gradual reduction in budget deficit. So the twin deficit hypothesis is not supported by the data. So the first part of the hypothesis seems to be right.

Lane, P., and G. M. Milesi-Ferretti. 2006. The external wealth of Nations Mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. IMF Working Paper no. WP/06/69. Washington, DC: International Monetary Fund.
Levine, R. 2005. Finance and growth: Theory and evidence. In *Handbook of economic growth*, P. Aghion and S. Durlauf, 865–934. Amsterdam: Elsevier Science.
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Table 4C.1 **Current account balance in billions of U.S.$ (estimates after 2006)**

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Canada	19.715	16.213	12.605	10.486	22.369	23.074	20.792	25.603	17.909
China	20.519	17.405	35.422	45.875	68.659	160.818	249.866	379.162	453.146
France	21.968	26.086	19.8	14.74	2.641	−23.951	−27.712	−39.363	−48.885
Germany	−32.557	0.38	40.588	46.286	117.988	128.379	147.134	175.371	174.137
Italy	−5.863	−0.639	−9.483	−19.605	−15.489	−27.461	−45.215	−47.964	−48.657
Japan	119.605	87.794	112.607	136.238	172.07	165.69	170.437	195.904	195.145
Russia	46.839	33.935	29.116	35.41	59.514	84.443	95.322	72.543	49.181
Saudi Arabia	14.336	9.366	11.889	28.085	51.995	90.11	95.514	83.122	81.807
United Kingdom	−37.649	−31.512	−24.79	−24.386	−35.405	−55.435	−77.236	−96.687	−105.144
United States	−417.429	−384.701	−459.636	−522.115	−640.157	−754.852	−811.483	−784.341	−788.293

Source: International Monetary Fund (2007) World Economic Outlook Database, October 2007.

Table 4C.2 **General government balance as percentage of GDP (estimates after 2006)**

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Canada	2.9	0.7	−0.1	−0.1	0.8	1.6	1	0.9	0.9
France	−1.5	−1.5	−3.1	−4.1	−3.6	−3	−2.5	−2.5	−2.7
Germany	1.3	−2.8	−3.7	−4	−3.8	−3.4	−1.6	−0.2	−0.5
Italy	−0.8	−3.1	−2.9	−3.5	−3.5	−4.2	−4.4	−2.1	−2.3
Japan	−7.6	−6.3	−8	−8	−6.2	−4.8	−4.1	−3.9	−3.8
United Kingdom	1.5	0.9	−1.8	−3.5	−3.4	−3.3	−2.7	−2.5	−2.3
United States	1.6	−0.4	−3.8	−4.8	−4.4	−3.6	−2.6	−2.6	−2.9
United States (in billions of U.S.$)	159	−39.35	−396.675	−529.775	−508.7	−446.525	−344.75	353.169	−414.781

Source: International Monetary Fund (2007), World Economic Outlook Database, October 2007.

For the second part, if one examines data on current account balance of countries all over the world in, say, 2005 and 2006, it is clear that while the United States ran huge CA deficits (US$811 billion in 2006), a number of developed and less-developed countries ran CA surpluses. In 2006, for example, the countries that ran the largest CA surpluses were China (US$250 billion), Japan (US$170 billion) and Germany (US$147 billion).[1] Therefore, one cannot say that the capital inflows into the United States were mainly supported by capital outflows from emerging markets where the levels of financial development were low. So the second part of the hypothesis can only be partially true.

For the third part, it is not immediately clear whether financial liberalization in the LDCs that ran CA surplus can reduce the CA deficit deficit in the United States. In fact, this topic should be the main theme of the present chapter. Note that to be consistent with the saving glut hypothesis, the kind of financial liberalization that one should consider in this context should be the type that attracts domestic savers to invest in domestic markets. This would include reducing government regulation in the financial sector, improving legal infrastructure to enforce contracts and protect property rights, and maintaining macroeconomic stability. Viewed from this perspective, I can see several areas where this chapter can improve if it truly wants to test whether the global saving glut hypothesis is true. First, the chapter should focus on emerging markets. Second, one should focus on variables that capture institutional quality that improves the domestic investment environment, such as legal infrastructure, corporate governance, and independence of judiciary. The variables that the authors of this chapter use are mainly not of this nature; instead, they use data that may or may not reflect institutional quality or investment environment. For example, activity in the stock market may not reflect high level of financial development if it is only a consequence of a lack of other high-quality channels for domestic savers to invest (e.g., bonds and bank deposits), as reflected in the recent stock craze in China. Third, not all types of financial reforms help domestic capital stay at home. On the contrary, some reforms tend to increase capital outflows rather than stamping them, such as reforms that allow home citizens to invest abroad. Therefore, one should distinguish between the different types of financial liberalization and expect them to yield different effects on the CA.

It is true that China, being an emerging market, is running higher than its share of CA surplus as the United States is running higher than its share of CA deficit (especially if one looks at not only data up to 2006, but also the estimated figures for 2007 and 2008 from the International Monetary Fund [IMF]). Therefore, to test the saving glut hypothesis, one should perhaps carry out an in-depth study of China. Would financial liberalization that reduces government regulation in the financial sector, improve legal infrastructure to enforce contracts and protect property rights, and maintain macroeconomic stability, reduce the CA surplus of China? Is it necessary for China to allow its currency to float more freely in order for its CA surplus to decrease substantially? A time series analysis or case study may be necessary to address this question.

1. They are followed by Russia (US$95 billion) and Saudi Arabia (US$95 billion).

Yet the present chapter does not seem to be directly testing the saving glut hypothesis. Instead, being inspired by the hypothesis, it carries out a cross-section analysis of the effects of financial development on current account balance. To bring the research closer to the saving glut hypothesis, I suggest focusing more on the LDCs, as these are the countries where financial reforms are more pronounced. Moreover, if one really wants to find out whether financial liberalization in general can reduce CA balance in LDCs, one should perhaps test it directly. For example, one can identify episodes of financial liberalization in the LDCs and then run a cross-section regression of lagged CA balance on dummies of episodes of financial liberalization while controlling for economic fundamentals that affect CA balance, such as exchange rate, business cycle, capital mobility, and so on. This will be less controversial than using variables that may or may not be able to capture financial liberalization.

Finally, the empirical study should be guided by theory. The Mundell-Fleming model immediately comes to mind, as it continues to be one of the most compelling models in international finance. If one adopts the Mundell-Fleming model, then how does financial liberalization affect current account balance in that context? Financial liberalization may be interpreted as an increase in the interest rate faced by lenders and a decrease in the interest rate faced by borrowers. In the Mundell-Fleming model, capital mobility and exchange rate regime affect how current account balance reacts to changes in the interest rate faced by lenders and that faced by borrowers. Therefore, both capital mobility (high, medium, low) and exchange rate regime (floating, managed, fixed) should be put on the right-hand side of the equation. To illustrate why exchange rate regime should be taken into account, note that if China continues to peg its currency to the U.S. dollar (albeit allowing it to appreciate slowly), one surmises that its current account balance would continue to be large even if it undertakes financial liberalization.

In summary, this chapter addresses a very topical and important policy issue. Its findings should provide valuable inspiration for future research.

References

Bernanke, B. 2005. The global saving glut and the U.S. current account. Remarks at the Sandridge lecture, Virginia Association of Economics, Richmond, Virginia.

International Monetary Fund. 2007. IMF World Economic Outlook Database, October 2007. http://www.imf.org/external/pubs/ft/weo/2007/02/weodata/index.aspx.

Comment

Edward Robinson and Liew Yin Sze

Professors Chinn and Ito have done a careful empirical analysis of the determinants of current account balances over the past two decades. We think their study is a useful complement to the volumes of more conceptual papers that have been written on this subject.

We will first make a few comments on the chapter's empirical findings before providing some general points on financial development in the Asian region. We close with some tentative remarks on the global imbalances.

Empirical Results

The authors set up a panel equation specification with five-year nonoverlapping data stretching from the mid-1980s. They include the usual set of conditioning variables, supplemented by a comprehensive list of other macroeconomic and institutional factors.

To begin with, there still appears to be a great deal of variation in current account balances that remained unexplained, especially for the emerging economies. In figure 4.10, the scatter plot for industrial countries shows a tighter relationship, while that for emerging economies displays a higher degree of "scatter" and more noticeable outliers.

However, the regressions do yield useful results. Allow us to comment on two of these.

Our first observation pertains to the evidence that fiscal balances do play a role in the determination of current account balances, particularly for the developed countries. Thus, the deterioration in the current account deficit in the United States in the early part of this decade coincided with a significant worsening of the fiscal position as well.

However, the relationship may not be an entirely strong one. It is noteworthy that the U.S. current account deficit continued to widen in recent years even though the fiscal shortfall has narrowed. In Asia, this "twin deficits" argument may also have been fairly weak. Many Asian governments had well-managed finances prior to the Asian crisis. The deterioration in the current account prior to the 1997 crisis was really driven by the saving-investment imbalance in the private sector, amid strong investments and capital inflows. Subsequently, although the fiscal position of many Asian nations deteriorated in the aftermath of the crisis, the current account has swung decisively into positive territory. Therefore, the fiscal balance may not be the dominant factor in the current account dynamics for all countries all the time.

Second, the focus of the chapter is on what the data can reveal about the role of financial variables. In general, we believe that the results and inferences in tables 4.1 and 4.2 are reasonable.

The coefficients of the financial development variables are generally considerably smaller than those for the standard macroeconomic factors such as fiscal balance, net foreign assets, and relative incomes.

Although not entirely comparable, these findings are broadly in line with similar studies by Beck et al. (2001), which find that overall financial development is positively correlated with economic growth. It is interesting to note that in the Beck et al. type studies, the *size* of the financial sector is usually not statistically significant.[1] What comes strongly through as more distinguishing across countries is financial activity and efficiency. In this study as well, the information content of efficiency/activity variables is likewise confirmed.

We would like to make two minor comments that would suggest adopting a more careful or nuanced interpretation of some results.

First, it must be said that financial variables are difficult to define and measure, especially in Asia. Furthermore, there is the potential multicollinearity between financial development and openness measures that the authors allude to. This issue is likely to be important for Asia because financial development tends to be directly correlated with being tapped into global financial markets. More broadly in Asia, the growth development strategy is an outward, export-oriented one.

Second, it is important to appreciate that the Asian economies went through an extended period of cleaning up and reform after 1997 to 1998. Against this, we may not wish to take the estimated coefficients as some form of long-term structural (or deep) parameters. For example, national savings tended to rise after the 1997 crisis as corporates and households attempted to rebuild their balance sheets. It may not have very much to do with financial openness or other institutional measures. (In other words, the coefficients could be biased by the "precautionary-rebuild-of-reserves" phase in the sample set.) This "discontinuity" may have been an important reason for the overestimation of investment in Asia (or underestimation of the current account surplus) by the Chinn-Ito model for the postcrisis period.

Relatedly, China is highlighted as an example of a country that would tend to run large surpluses given its large but closed financial market and low index of institutional development. Large current account surpluses in China are in fact a relatively recent phenomenon. Actually, its average an-

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The views expressed here are entirely those of the discussants and should not be attributed to the MAS.

1. In the Beck et al. (2001) study, *finance size* is defined as the log of the sum of private credit and market capitalization.

nual current account balance was close to 1 percent of gross domestic product (GDP) between 1982 and 2004. China's current account balance only swung into a large surplus of over 7 percent of GDP in the last two years. Nonetheless, we would agree that the combination of macroeconomic, financial, and institutional developments in China is likely to sustain its current account surpluses, going forward.

Despite the preceding caveats, we have no doubt that the variation in financial development lies behind the distribution of the current account outcomes we observe. A more developed financial system allows the link between domestic savings and investments to be broken, which permits a country to optimize consumption on an intertemporal basis.

Indeed, a validation of this point is readily available from studies that considered this from the capital flow perspective. Our colleague Chew (2006) utilized an "augmented" gravity model to analyze the effect of various factors on cross-border asset holdings. She made use of the bilateral data set on financial investment of over 200 countries in the International Monetary Fund's (IMF) Coordinated Portfolio Investment Survey (CPIS) over the period 2001 to 2005.[2]

The standard gravity model was "augmented" in order to account for financial development and institutional variables and estimated for various country blocs including Asia. Chew's analysis showed that the size of cross-border financial flows increases significantly with the financial development of the domestic and foreign financial markets. Her finding is consistent with the results of the Chinn-Ito chapter as greater financial development in emerging market economies reduces the constraint on domestic investment spending. This is reflected as an increase in the dispersion of current account balances across countries. Chew also found that institutional factors, such as regulatory standards and capital controls, are important determinants of cross-border capital flows. In addition, the degree of transparency and disclosure by financial institutions is seen to have a statistically significant role in augmenting cross-border financial flows by providing a boost to investor confidence.[3]

Future Financial Development in Asia and Implications for Capital Flows

We would classify this chapter as belonging to the genre of studies that seek to understand the role of financial development in the broader context of sustainable economic growth.

2. This data set provides a geographical breakdown of total portfolio investment assets in a bilateral matrix displaying stocks of cross-border holdings of assets measured at market prices.

3. Restricting the data set to Asian countries as destinations for international capital flows, the results remain that financial development and other institutional factors have a significant impact on the size of financial flows into Asia. Variables such as regulatory standards are important determinants of the sources, but not destinations, of financial flows into Asia.

We believe that Professors Chinn and Ito's focus on financial development and institutional factors is timely. The Asian financial crisis ten years ago vividly brought home the fact that in the race for growth, Asian governments, and even multilateral institutions, had neglected or downplayed the "software" aspect of economic development, that is, developing the institutions, systems, infrastructure and legal framework, and human resources required for a modern market-based economy. This aspect of development is perhaps the most difficult.

In Singapore, the development of deeper and more liquid financial markets has certainly helped in raising economic efficiency via improved allocation and deployment of capital. The deepening of the financial markets has also strengthened resilience to shocks and allowed a large current account surplus to be accommodated efficiently, in this case, through fairly sizeable capital outflows.

What about the rest of Asia? It has often been said that regional integration has thus far been a "real story," that is, Asian trade integration has proceeded rapidly, driven to a large extent by the outsourcing activities of multinational corporations and the development of a highly integrated regional production network. Indeed, it has become increasingly clear that financial development has not kept pace.

Asia's bond markets, for example, constitute only 113 percent of GDP, compared to 193 percent in the United States and 151 percent in the European Union. Excluding Japan, this percentage falls to just 49 percent.

At this juncture, we would like to bring together two pieces of research we have been interested in.

First, we have been doing some work at the MAS in estimating the likely profile of current account balances for some key Asian countries. Our estimates, which use as a starting point the simulations and projections from the IMF, show that that the current account surpluses in Asia are likely to persist, led to a significant extent by the growing trade surpluses in China. For example, China's current account surplus is expected to reach some US$275 billion (or 6.5 percent of GDP) or more in 2011.

Second, there have been a number of papers revisiting the Lucas Paradox. A recent IMF study examined the experience of Europe and found that with increasing financial integration, capital in Europe flowed in the correct direction, that is, "downhill" from rich to poor (or less rich) countries within the Union (Abiad, Leigh, and Mody 2007). Poorer countries that are financially integrated run larger current account deficits, whereas the richer countries run surpluses. Thus, financial integration in Europe was a force driving the increase in current account dispersion within the region.

So for Asia, taken together, these results point toward the need for increased collaborative efforts to accelerate the pace of financial deepening and integration. A well-developed financial sector in Asia will help to raise investment spending in the region and contribute to the reduction of the

saving glut. Increased financial integration could also nudge capital flow "downhill" from rich to less-rich countries within Asia itself.

Professors Chinn and Ito's findings give us the basis for confidence that as financial deepening proceeds in the Asian economies, the dynamics of capital allocation are likely to improve and with it the sustainability of the current account path.

Conclusion

We conclude with some remarks on the global imbalances. It may be fair to say that, at best, the current state of affairs represents an "unholy truce" among diverse groups of financial participants, each having a vested interest in prolonging the status quo.

Indeed, at the moment, the global economy seems to be headed for an uneventful and gradual correction of the imbalances. While U.S. GDP growth has slowed, the expansion in Europe and Japan has picked up, and the growth of some of the key emerging economies, including the BRICs—namely Brazil, Russia, India, and China—has remained firm. This broadening of global growth would tend to error correct or at least stabilize the imbalances. The fall in the trade-weighted US$ since early 2002 and relatively more stable oil prices will also help.

We, therefore, suspect that Bretton Woods II may well be a passing phase rather than a stable long-term equilibrium. Asian currencies have generally become more flexible in recent years, and this is an important development in view of projections of sustained saving-investment imbalances in the region. Adjustments in exchange rates would eventually manifest themselves to restore equilibriums. Over the longer term, the scope for greater exchange rate flexibility in Asia will likely increase along with efforts to further deepen the financial infrastructure and supporting institutions.

References

Abiad, A., D. Leigh, and A. Mody. 2007. International finance and income convergence: Europe is different. IMF Working Paper no. WP/07/64. Washington, DC: International Monetary Fund, March.

Beck, T., A. Demirgüc-Kunt, R. Levine, and V. Maksimovic. 2001. Financial structure and economic development: Firm, industry, and country evidence. In *Financial structure and economic growth: A cross-country comparison of banks, markets, and development*, ed. A. Demirgüc-Kunt and R. Levine, 189–242. Cambridge, MA: MIT Press.

Chew, C. 2006. The global capital market from Singapore's perspective. Monetary Authority of Singapore. Mimeograph.

5

Consumer Credit Market in Korea since the Economic Crisis

Chang-Gyun Park

5.1 Introduction

The purpose of the chapter is twofold. One is to document the chronology of rapid growth of household credit in Korea since the foreign exchange crisis in 1997. The other is to examine the development of the credit card crisis in 2003 and evaluate the adequacy of ensuing policy responses.

Rapid increase in household debt was primarily the result of a large-scale deregulation and paradigm shift mainly driven by various efforts taken to restructure the entire financial sector after the foreign exchange crisis in 1997. The new principle adapted by financial institutions after the financial deregulation was to put most emphasis on resource allocation based on market mechanism. Price signal replaced direction government intervention as the criterion in allocation of credit resources. It was a well-known secret in the Korean financial market that household lending had been more profitable than corporate lending. Consequently, removal of government intervention coupled with a low interest rate resulted in expansion of the consumer credit market in an unprecedented pace. While one cannot deny the fact that allocation of credit resources based on price signal increased the efficiency of the economic system, recent economic history offers many examples of financial turmoil that were sparked by rapid accumulation of debts soon after deregulation of the financial sector without carefully revamping the regulatory framework. The deregulation of the financial industry in Korea after the foreign exchange crisis was not an exception in the sense that it was followed by a boom in the consumer credit market that eventually resulted in a violent crash landing.

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