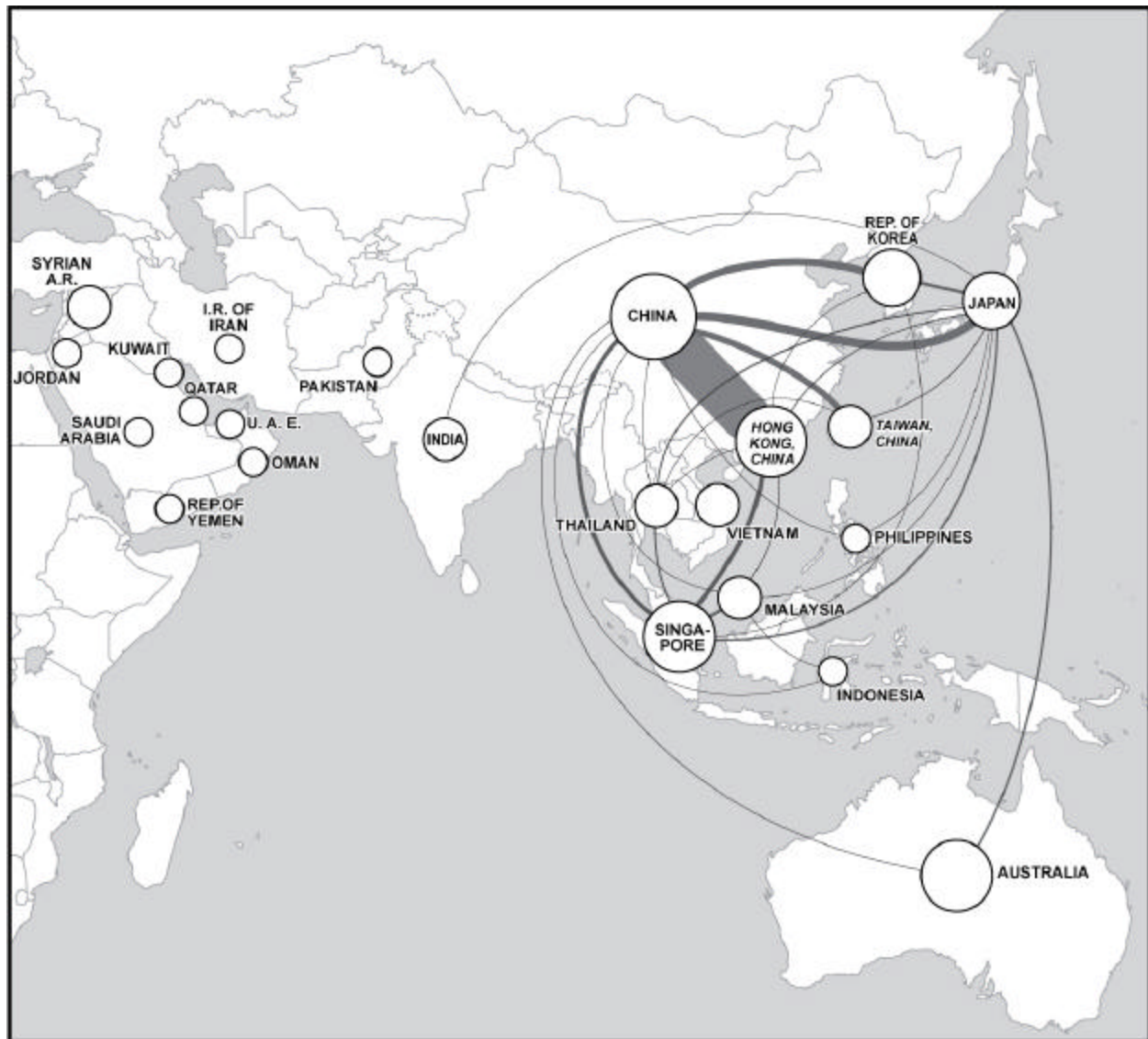


## 4. Finance

Map 4: Intra-Asian FDI Flows, 2004.

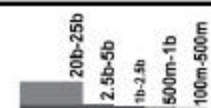


○ TOTAL FDI (billions in U.S. dollars)

The map shows all intra-Asian bilateral FDI inflows over \$100 million.



The area of each circle is proportional to the annual average FDI inflows from the entire world into each country, in the 2000-2004 period.



**BILATERAL FDI INFLOWS**  
(m = millions in U.S. dollars)  
(b = billions in U.S. dollars)

Each band is proportional to the annual average FDI inflows in both directions for each pair of countries, in the 2000-2004 period (or available years within that period).

Source: World Bank staff estimates.

## 4.1 From breakdown to buildup

The financial structure underpinning rapid economic growth and trade in East Asia broke in 1997-98. The massive economic dislocation and loss of market value by firms underlined the necessity of developing a more robust regional financial architecture to support trade and investment. Whereas prior to the crisis one could say that the focus of attention was on mobilizing finance, since the crisis the focus has shifted to the efficiency of resource allocation, the diversification of supply, and the reduction of systemic risk. The structure of the financial system has become more important. At the same time, because of the considerable integration of financial markets, both globally and within the region, policy makers have recognized that stability depends not just on each country's efforts and financial structures, but also on how the financial links between countries operate.<sup>88</sup> This chapter looks at how the structure of finance in the region is changing and considers the remaining challenges to a system that can support the kind of trade and innovation that is necessary for continued rapid growth in the middle-income and rich countries of the region.

Map 4 shows that the countries in the region are increasingly linked by foreign direct investment. Singapore, Hong Kong (China), Korea, Taiwan (China) and Japan all have links with each other as well as with China. China is of course the dominant recipient of FDI from the region, as is to be expected for an economy of its size, but Thailand, Malaysia and the Philippines also have strong FDI linkages across the region. Only Indonesia, which had been a central destination for Japanese FDI before the crisis, appears to be less well integrated. While some FDI is now moving to India from Japan, the amounts are still low in absolute terms.

The growing regional links in FDI and the resilience of these flows contrast with the falling share of FDI from the U.S. and Europe. At the same time, cross-border bank loans and portfolio flows have oscillated, while foreign exchange reserves have soared, reaching US\$1.6 trillion (excluding Japan) by the end of 2005. East Asia has become a significant net exporter of capital to the rest of the world. Meanwhile, domestic financial assets—bonds, equities and bank deposits—have soared after the crisis, reaching US\$9.6 trillion. This in turn leads to a set of related questions which we explore in this chapter:

- Has there been a shift in the manner in which the East Asian economies are engaging with global and regional capital markets, and if so, what has motivated this change?
- How have East Asian domestic financial markets changed following the crisis?

### *4.1.1 How finance supported production networks prior to the 1997-98 crisis*

Within East Asia, finance has always been viewed as a mechanism to support the real economy. To understand how and why financial structures have changed in the region, it is therefore important to understand how the real economy needs have changed and, in particular, to understand the financial requirements of production networks.

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<sup>88</sup> See A. Sheng (2006) on the Asian network economy.

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Production networks need low cost, long-term finance for capital investment and expansion of facilities. They need short-term working capital to finance trade, and more patient capital to finance innovation and research. Thus production networks require a set of specialized financial products.

As the production chain becomes more complex, the potential risks within the system also become more complex. Global or regional production networks operate internationally, and therefore need a broad array of cross-border financial services. They are exposed to currency risk when the cost structures of different components are dependent on local currency wages. As most trade is denominated in U.S. dollars, and as the U.S. is the most important end consumer of Asian production networks, financing throughout the network is best undertaken in US dollars. Where it is not, a currency risk arises. A movement in local currencies against the U.S. dollar can affect the cost of inputs relative to product prices and thereby directly affect profits.

In addition to international operations, production networks encompass a large and diverse number of companies with different contractual agreements with each other. Affiliates, subsidiaries, original equipment manufacturers and other types of related companies, some big and others small can all be engaged in a network. Each transaction within this chain of producers carries with it some credit risk.

As was made abundantly clear in 1997-98, currency risk and credit risk can combine and accumulate.

Production networks in East Asia developed rapidly after the Plaza agreement in 1985. This sharp realignment appreciated the yen against the U.S. dollar and European currencies. It encouraged Japanese firms to relocate abroad. It also provided Japanese banks with a larger capital base from which to make U.S. dollar denominated loans to their domestic multinational clients and their affiliates. Japan became one of the first countries to embrace off-shoring and to develop the organizational systems needed to establish production networks. Japanese banks and Japanese foreign investors therefore played a very important role in the early development of East Asian production networks.

The interlinked system of FDI and international bank lending proved adequate for quickly expanding production networks throughout East Asia. FDI provided the equity capital needed for building new plant and for funding innovation where needed. It was used primarily in middle-income countries like Thailand, Indonesia and Malaysia where domestic capabilities were less strong. In South Korea and Taiwan (China), which had more restrictive foreign exchange regimes, off-shoring took place through commercial arrangements. Japanese multinationals used their own credit standing to mobilize the resources to invest abroad, mostly using banks in their home countries.

Bank credit, on the other hand, was used to provide short-term trade finance. Because a major multinational was the central organizer of the production network, banks were happy to take the credit risk of suppliers in the chain, knowing that the credit risk of the buyer was sound. Traditional commercial banking products such as letters of credit provided the mechanism for such transactions. International banks could minimize their risk by intermediating their funds through local banks who had better information on the credit standing of suppliers and who could more easily monitor management in the diverse companies within the supply chain.

This system of financing relied heavily on the absence of significant currency or credit risk. Governments were relied on to minimize currency risk, while local banks were relied upon to minimize credit risk.

When Thailand was forced to devalue the baht in July 1997, following a series of speculative attacks on the currency, the assumptions on which production networks had been organized were shattered.

There have been many descriptions of the East Asian crisis and many factors came into play. Here, it is useful to mention just a few facts. First, East Asia suffered from a major capital reversal during the crisis. As Andrew Sheng (2006) notes, in the five years to 1997, roughly US\$200 billion flowed into emerging East Asia. In the next two years, about US\$160 billion left the region. Much of this can be attributed to Japanese banks which withdrew about US\$65 billion from the region, part of a global exposure reduction of US\$170 billion between 1996 and 2000. The retrenchment of credit coincided with a depreciation of the Japanese yen against the U.S. dollar from 85 to 135 yen/dollar between 1995 and 1997. This movement, combined with a fall in the Nikkei stock index, increased the loan/capital ratio of major Japanese banks. With almost 80% of their international loans being booked to Asian borrowers, it is not surprising that the bulk of the adjustment fell on East Asian economies.

Second, the crisis period coincided with the growth of international capital markets. In addition to bank lending, portfolio flows from abroad had risen steeply in the mid-1990s, responding to rising local equity markets. Equity finance was attractive to many firms in the region because it freed them from the surveillance of banks and of multinational firms. With less scrutiny from lenders, local firms were able to venture into areas other than production networking, including more speculative real estate development. This was not limited to firms. Local banks, too, used the opportunity of available foreign finance to shift to nontradables financing. So-called agency problems proliferated.

Portfolio flows are traditionally more volatile than bank credits. But they can also increase the likelihood of bank credit reversals. When banks provide both short-term and long-term credits, they are more likely to be patient and roll-over short-term credit lines in difficult times in order to protect the value of their medium-term claims. When portfolio flows replace bank medium-term credits, then the incentive for banks to exit at the first sign of trouble grows. Thus, the probability of capital flow reversals and “sudden stops”<sup>89</sup> increases with a more varied structure of finance.

A third important observation is that at the time of the crisis supervision of local banks was weak and the credit culture in economies that were worst hit by the crisis was generally considered to be poor. Leverage of corporate borrowers had risen to very high levels, and exposure to firms with interest coverage ratios less than one was high. The monitoring and oversight function that is supposed to come with bank credits was absent in many East Asian economies.

It would be an overstatement to claim that these factors caused the East Asian financial crisis. There are too many other factors that also played a role. But it is not too farfetched to claim that the crisis revealed:

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<sup>89</sup> The sudden stop was first suggested in Dornbusch, Goldfajn and Valdés (1995). See also Calvo (1998).

- A need for more reliable mechanism to ensure foreign exchange predictability
- A need for better mechanisms for pricing credit risk
- A need for better corporate governance to reduce agency problems

East Asian policy makers discovered to their cost what theoretical economists had already foreseen. They tried to move towards capital account convertibility to ease the flows of capital and dividends to grease production networks. They tried to fix the exchange rate to minimize foreign exchange risk. And they tried to pursue an easy monetary policy to encourage investment in their countries and to keep growth going. These three desirable attributes cannot be simultaneously achieved. Frankel (1999) refers to them as the “impossible trinity.” A balance has to be struck. That balance required changes in the way in which financial systems were integrated globally and regionally, and in the way in which they developed domestically.

## 4.2 The pattern of global and regional financial integration

After the crisis, the nature of international capital flows in East Asia has changed perceptibly. Foreign direct investment levels, in aggregate, have been relatively stable, but the composition has shifted markedly. Much more FDI originates within East Asia today than prior to the crisis. At the same time, the number of FDI sources has grown, with Korea, Hong Kong (China), Taiwan (China) and Japan all playing important roles. Recognizing the value of FDI, countries in the region have liberalized their foreign investment regimes. An index of foreign investment openness—defined as the sum of FDI inflows stock plus FDI outflows stock divided by GDP—in the region shows that foreign investment is playing a much more important role today: the index has risen from 10% in 1990 to 28% in 2004.

Other flows to the region have been more volatile, especially to China. These flows have been pulled into countries by their internal policies and performance and pushed out of developed countries by broader global factors such as interest costs and liquidity. Recent research suggests that pull and push factors may be complementary, with push factors determining the timing and magnitude of capital flows to emerging economies and pull factors determining their geographic distribution.<sup>90</sup>

The biggest change in the region’s financial integration, however, revolves around its foreign exchange reserve accumulation and its management of foreign exchange risk. The stock of reserves had increased to over \$1.6 trillion by end 2005, with every indication of continuing its upwards trend, despite the fact that countries have moved to more flexible exchange rates, at least *de jure*. But at the same time, East Asian economies have moved to cooperate regionally on financial matters, under the auspices of ASEAN+3, in a way that reflects a determination to integrate regional financial markets. Yet if shocks in the region are correlated, as they would be if a production network were affected, then risk sharing with the rest of the world would be more efficient than risk sharing within the region.

Table 4.1 shows these trends in foreign capital flows.

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<sup>90</sup> See Carlson and Hernandez (2002), Dasgupta and Ratha (2000), and Montiel and Reinhart (2000).

**Table 4.1: Trends in capital flows to emerging East Asia, 1990-2005 (US\$ billion)**

<b>Emerging East Asia</b>	<b>Average 1990- 1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Direct investment, net	27.0	51.9	54.7	54.4	64.0	58.3	43.6	42.3	59.7	50.5	74.0
Portfolio flows, net	7.8	17.0	0.4	4.0	31.8	11.6	-68.1	-72.4	-16.9	-14.2	-16.2
Other capital flows, net	17.4	37.6	-75.3	-134.5	-101.7	-81.1	14.3	7.2	-49.8	33.8	-22.0
Change in reserves	40.7	61.5	18.8	60.7	74.4	45.7	69.4	154.8	236.2	337.1	243.1
<i>Memo items:</i>											
Stock of foreign direct investment	229.2	417.2	625.2	658.3	888.9	962.9	945.0	887.8	984.5	1,111.9	1,243.5
Stock of foreign exchange reserves	289.5	466.4	485.1	545.9	620.2	666.0	735.3	890.1	1,126.4	1,463.5	1,706.7

Note: Emerging East Asia = Developing East Asia + East Asia NIEs.

Sources: IMF, International Financial Statistics; UNCTAD, World Investment Report, 2005 (stock of inward foreign direct investment); and, staff calculations.

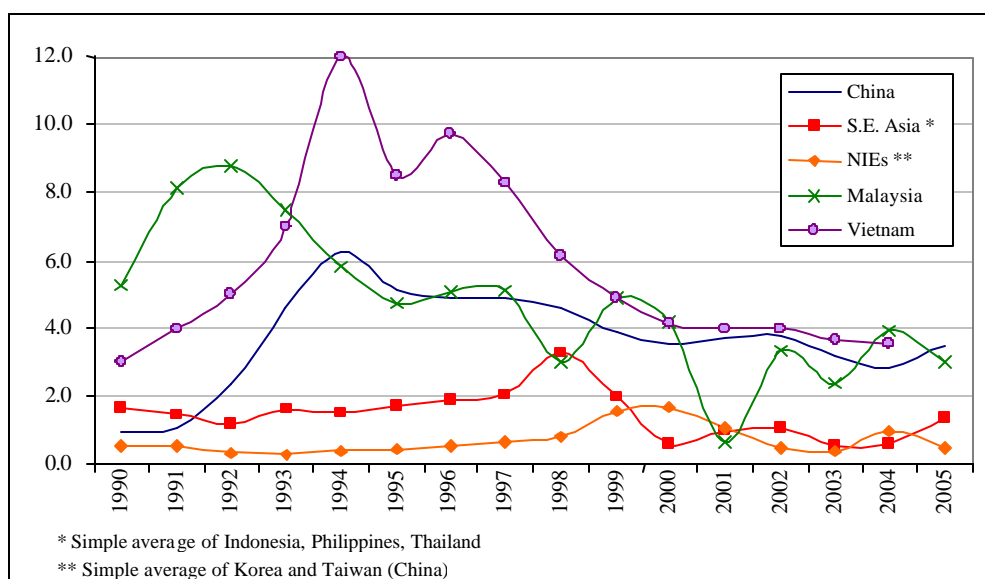
### 4.2.1 Foreign direct investment

Foreign direct investment has been important across East Asia for capital formation and for upgrading technology. Most foreign investment has been vertical, that is, associated with production networks and supply chain networks organized to minimize cost. This kind of FDI is closely linked to higher trade between countries. Horizontal FDI, on the other hand, describes a process where foreign producers jump trade barriers so as to reduce their costs of accessing the domestic market. These costs can arise from a variety of trade frictions, such as tariffs, distance and transport costs, time to market, or costs of providing customer services. Horizontal FDI is trade reducing.

Figure 4.1 shows the level of gross FDI inflows across East Asian countries. Like trade, both inflows and outflows of FDI can yield benefits to countries. Gross inflows show the degree to which foreign management and technology is being imported. Gross outflows show the degree to which local firms are able to reduce costs by moving production abroad. Thus, the impact of FDI does not depend on its net level, as given in balance of payments statistics, but on the gross levels.

The figure shows a high level of FDI, averaging 4% of GDP across East Asia. The latecomer middle-income countries have relied particularly heavily on FDI. Malaysia had inflows reaching over 8% of GDP in the early 1990s, before seeing its FDI taper off. China and Vietnam are currently the largest destinations for FDI in proportion to their economies. Korea and Taiwan (China) on the other hand have historically had strategies that did not rely on FDI. The trailing off of FDI in the Philippines, Indonesia, and Thailand is of more concern. These economies had had FDI inflows of 2-3% of GDP before the crisis but now have much lower levels.

**Figure 4.1: FDI Is important in China, Vietnam, and Malaysia: FDI flows to East Asia, 1990-2005 (as % of GDP)**



FDI flows in aggregate were not materially affected by the 1997-98 crisis, although they did decline in absolute value in some economies as the level of GDP and trade fell. FDI only collapsed in Indonesia where a radically new business environment caused investors to rethink their long-term business strategies and exposure. Indonesia received 25% of Japanese FDI to emerging Asia in 1992 but only 3 percent in 2004. In some countries, such as South Korea and Thailand, FDI actually increased shortly after the crisis as a result of a wave of mergers and acquisitions triggered by economic reform in these countries. Mody and Negishi (2001) report that cross-border M&A in emerging East Asia rose from \$3 billion in 1996 to \$22 billion in 1999, as foreign firms purchased distressed assets from the banking sectors. In 1999, M&A accounted for 30 percent of all FDI.

FDI based on mergers and acquisitions have tended to be concentrated in the nontradable service sectors, such as wholesale and retail trade, real estate and financial services. They have a different impact on the economy than greenfield investments in manufacturing for export. Nevertheless, they have contributed to raising productivity in some of the less efficient sectors.

More recently, the composition of foreign investment has changed. An increasing proportion of FDI is sourced from the region, with Korea, Taiwan (China), Hong Kong (China) and Singapore becoming important investors. But even the middle-income countries of the region are investing in each other.

The growing web of FDI flows within the region, depicted in Map 4, is good evidence that the development of regional production networks is flourishing. The coexistence of this increased FDI with increased intra-regional trade suggests that most FDI is vertical<sup>91</sup>, and this in turn provides additional evidence that production networks are spreading.

Production networks can be global, in principle, but in practice they are regional within East Asia. Geographic proximity appears to be a significant determinant of FDI location, other things equal. Market size also shows up as significant. A survey of Japanese investors discussed in the 2005 White paper on international economy and trade of the Japanese Ministry of Economy, trade and industry (METI 2005) shows that Japanese firms are concerned about bureaucratic quality of host countries and about macroeconomic risk.

The emphasis on FDI comes about because it has long been considered a source of technology transfer as well as a source of capital. One study<sup>92</sup>, based on firm level surveys, found that total factor productivity was significantly higher in Indonesia, Korea, the Philippines and Thailand when a firm was foreign owned, controlling for other factors such as age, sector, and size. Furthermore, when foreign ownership was in a majority, the productivity gains were highest, suggesting that management control gives greater incentives and ability to invest in technology improvements. The reported productivity differentials are large—around 40 percent in Indonesia and the Philippines and 10-20 percent in Korea and Thailand.

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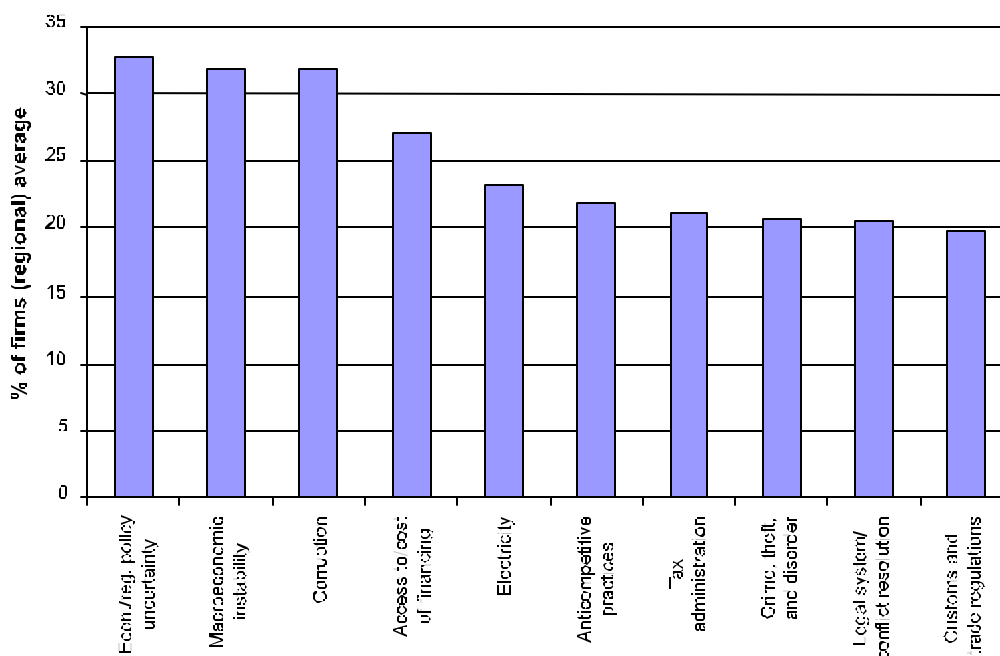
<sup>91</sup> See Gopinath and Echeverria (2004), and Blonigen (2005).

<sup>92</sup> Hallward Driemeier, Iarossi and Sokoloff (2002).

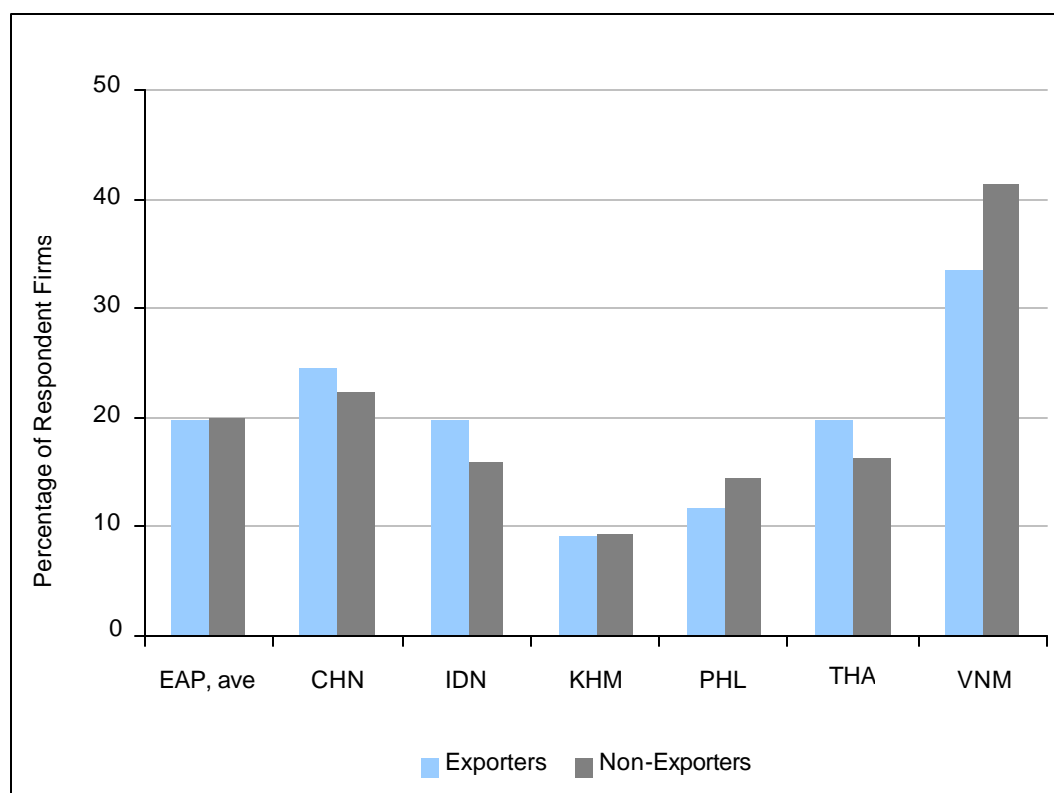
In general, the policy environment for facilitating FDI is similar to the broader policy environment for investment in a country. The World Bank has conducted surveys of several thousand firms across the region since 2003, asking firms about the key constraints they face. In general, the results show that key concerns relate to policy. Macroeconomic risk remains at the top of the agenda, both for exporters and for domestically oriented firms. Regulatory and policy risk (especially in decentralized economies), skills availability, infrastructure quality, and corruption are other key concerns. There is much that can be done on these fronts to improve business conditions in the region, and these reforms are important if the middle-income countries are to continue to be competitive with lower cost producers such as China and Vietnam (Figure 4.2).

It is also worth emphasizing that about 20% of firms in East Asia feel that access to finance is a major or very severe obstacle. This proportion is somewhat higher for exporters than for non-exporters in China, Indonesia, and Thailand. But these perception data need to be interpreted with caution. The fact that a low fraction of firms in Cambodia report major obstacles in obtaining access to finance is probably more telling about the severe nature of other problems facing Cambodian firms than about ready access to finance (Figure 4.3).

**Figure 4.2: Policy uncertainty, macro instability, corruption, and cost of finance are the most cited constraints to firms (% of firms identifying problem as "major" or "very severe" obstacle)**



Source: World Bank, *Investment Climate Surveys* - China (2002, 2003), Indonesia (2003), Cambodia (2003), Philippines (2003), Thailand (2004), Vietnam (2005)

**Figure 4.3: Access to finance is a problem for exporters and non-exporters**

Source: World Bank, *Investment Climate Surveys* - China (2002, 2003), Indonesia (2003),

#### 4.2.2 Other capital flows

While international bank credit naturally followed foreign direct investment in the early stages of production networks, it has become less important today. Partly, this is a consequence of greater financial openness. It is not surprising that countries with high levels of trade should also move towards greater financial openness. Capital controls become quite hard to enforce when trade flows are large—export under-invoicing and import over-invoicing is expensive to monitor. Some analysts have put weight on political economy forces<sup>93</sup>. Closed, repressed domestic financial sectors can be a mechanism for protecting domestic sectors against new entrants and competition. But in an open trade regime, there is already competition from abroad, so protection against domestic entrants is less of a concern.

In this environment, most countries in East Asia have moved to liberalize their capital accounts even after the crisis. The temporary controls introduced by Malaysia have been lifted. China is also gradually liberalizing.

<sup>93</sup> Rajan and Zingales (2004).

Most analysts have concluded that the reduction in trade credit lines at the time of the crisis was greater than would be justified by fundamentals and by the risks involved.<sup>94</sup> They attribute this to leverage issues, which make banks quite risk averse, and to broad exposure rules. When country exposure ceilings are reduced by international bank management, there is no differentiation between instruments. Non-renewal of short term trade finance instruments is the most convenient way of complying.

Institutional reasons might also play a part. Trade credit is a low-return business and many international banks have exited. As a business line, trade credit can be valuable for building relationships and gathering information that can then be used for other higher value products that banks can sell, such as investment banking services. But if these other products dry up, the incentive to remain involved with trade credits also declines.

Given these structural weaknesses in international credit, it appears likely that the risk of sudden capital reversals is one that countries must reckon with, especially if they are heavily dependent on bank credit, as is true for most middle-income countries.<sup>95</sup> General prescriptions, such as ensuring sound macroeconomic policy and a healthy domestic banking system, remain important components of a strategy to reduce the likelihood of capital flow reversals.

Middle-income economies are most susceptible to the risk of sudden capital stops because they lack deep, liquid capital markets that can properly price risk. As a result, risk management takes the form of changes in the volume of credit extended. This line of argument suggests that better integration of domestic capital markets will be beneficial. But should this integration be global or regional or both?

As a matter of practice, regional integration is more likely to occur than global integration. Portes and Rey (1999) point to the importance of information asymmetries in capital market integration, and link this with geographic distance in the same way as trade models. They argue that trade in goods and investment in foreign assets both generate valuable information which reduces transaction costs. The implication is that countries with more trade will tend to have more cross-border asset flows and vice versa. This has been confirmed econometrically by Aviat and Coeurdacier (2005) and Aizenman and Noy (2004).

There is also direct evidence that intra-regional foreign portfolio investment is increasing. According to the IMF's Coordinated Portfolio Investment Survey, foreign portfolio investment in both stocks and bonds coming into East Asia has increased from 9 percent of the region's GDP in 1997 to 14 percent in 2003. Notably, the share of portfolio investment coming from East Asian NIEs has more than doubled between 1997 and 2003 (Table 4.2).

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<sup>94</sup> IMF (2003) Trade Finance in financial crises.

<sup>95</sup> For instance, see Ito and Park, eds. (2004) and Eichengreen and Luengnaruemitchai (2005).

**Table 4.2: East Asia NIEs have replaced Japan as the regional source of portfolio finance (%)**

<i>Portfolio investment (%)</i>	<i>1997</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>
United States	41.4	37.0	37.4	37.0
Japan	12.7	6.3	6.6	4.3
European Union	27.3	34.2	28.5	30.9
East Asia NIEs	6.1	13.8	17.4	15.2
Developing East Asia	0.5	0.4	0.4	0.3
Others	15.0	13.4	13.6	15.8
Total	100.0	100.0	100.0	100.0

*Source:* staff estimate based on IMF Coordinated Portfolio Investment Survey data.

By 2004, the East Asian NIEs held a larger absolute value of equity and bonds in developing East Asian countries than the U.S., Japan or the EU. Unlike the developed countries, NIEs have a much greater share of their portfolio investments in the developing countries of the region (Table 4.3).

Another way of looking at integration is to econometrically estimate the co-movement of equity returns in a country with equity movements in another country or region. The closer the co-movements, the more one can claim that equity markets are integrated. This is the approach used by Beale et al. (2004) for Europe and Kharas, Aldaz-Carroll, and Rahardja (2007) for East Asia. Kharas et al. look at how equity returns in middle-income countries in East Asia react to a regional average of equity returns (excluding the dependent country), equity returns in Japan and equity returns in the United States of America. They do this for two periods, before and after the 1997-98 crisis, using weekly data. They find that some East Asian countries are closely integrated with regional

**Table 4.3: Since the crisis, NIEs have become the most important portfolio investors in developing East Asia portfolio investment into developing East Asia, 1997 and 2002, US\$ billion**

	1997	2004
Equity (Total)	32.6	122.0
U.S.	14.4	32.4
Japan	2.0	4.9
E.U.	8.1	36.7
NIEs	6.0	37.9
Bonds (Total)	40.2	67.0
U.S.	17.2	10.8
Japan	10.0	3.7
E.U.	7.9	19.2

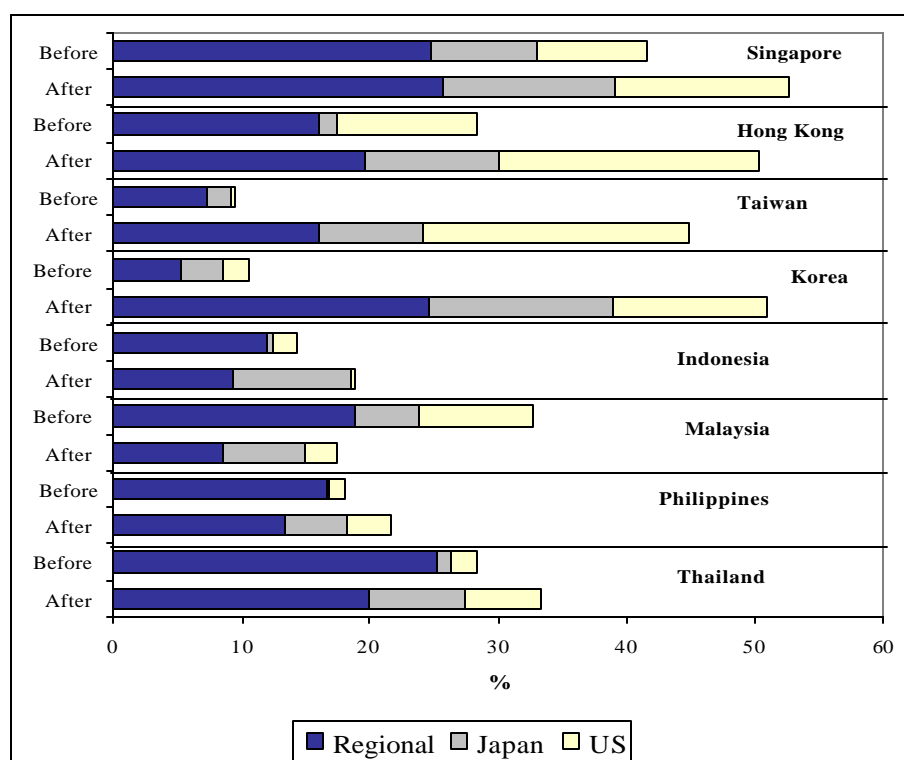
*Source:* Ghosh (2006).

markets, with the degree of integration approximately the same as that found by Beale et al. for the Euro area. On average, post-crisis, equity markets in East Asia are showing greater integration with the region, as well as with Japan and the United States.<sup>96</sup> Figure 4.4 below shows the correlations.

### 4.2.3 Foreign exchange reserve accumulation

Emerging East Asia has accumulated over US\$1.6 trillion dollars in foreign exchange reserves, almost all of it after the crisis. This has occurred despite an ostensible move in the region towards more flexible exchange rates. The pattern of accumulation is the same across almost all countries and also Japan (Figure 4.5). The region as a whole accounts for about one-half of global reserve accumulation in the world.<sup>97</sup> While China and Japan have been the drivers of this trend, Korea and the other NIEs have also experienced significant swelling of their reserves since the crisis.<sup>98</sup> For Korea and other economies

**Figure 4.4: Return volatility explained by regional, Japan, and U.S. news**



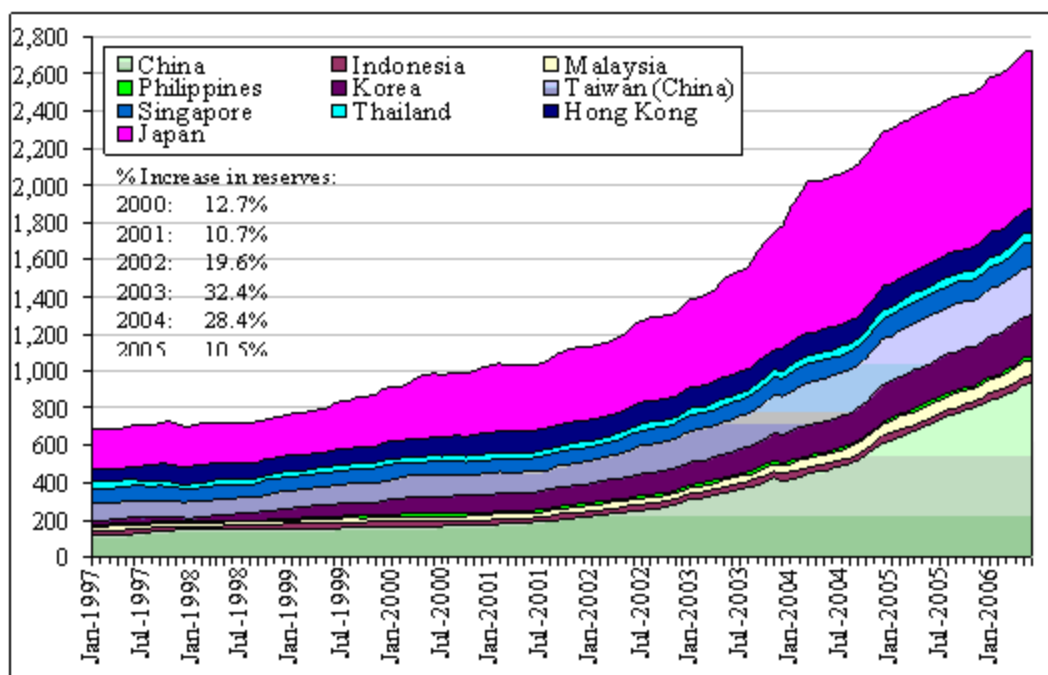
Source: Kharas, Aldaz-Carroll and Rahardja (2007).

<sup>96</sup> Malaysia shows up as an exception, perhaps because it had capital controls for much of the post-crisis period under study.

<sup>97</sup> See Aizenman and Siregar (2006) for more detailed descriptive data of reserve stockpiling in East Asia.

<sup>98</sup> Outside East Asia, but still in Asia, India has also seen a sharp increase in reserves from \$1 billion in 1990-91 to \$150 billion by early 2006.

**Figure 4.5: Foreign exchange reserves have grown after the crises, especially in China and Japan (US\$ billion, 1/1997–6/2006)**



Source: IMF, *International Financial Statistics*; Haver Analytics.

that were hit by the crisis, policy makers have chosen explicitly to amass reserves for precautionary or self-insurance motives against future financial crisis.<sup>99</sup>

The precautionary or financial safeguard motive for reserve accumulation is consistent with modern second-generation currency crises models, such as those developed by Obstfeld (1986, 1994). These models emphasize the possibility of multiple equilibria in a world of substantial capital mobility where a country's underlying payments position is neither quite strong nor hopelessly weak, i.e., where it is in a vulnerable zone. In such circumstances, a country's reserve level not only influences its ability to finance speculative runs on its currency, but can also have a bearing on the probability of occurrence. Such large levels of "own liquidity" may be particularly necessary in the absence of acceptable international lender of last resort programs, such as those developed by the IMF, and the untested programs of monetary cooperation at the regional level.<sup>100</sup>

Others who promote the precautionary motive note that the difference in reserve accumulation levels between emerging markets is closely related to the degree of capital

<sup>99</sup> See Aizenman and Marion (2003), and Bird and Rajan (2003). There has been a growing body of literature exploring various aspects of the precautionary motive for reserve hoarding. See Aizenman et al. (2005), García and Soto (2004), Jeanne and Ranciere (2006), Kim et al. (2004) and Li and Rajan (2005).

<sup>100</sup> See Bird and Rajan (2002), and Rajan (2003).

market liberalization and global integration. Empirically, the higher the level of capital account liberalization (relative to 1980), the higher is the ratio of reserves to GDP.

Reserves have also been building up as a side effect of exchange rate objectives. Some have argued that the reserve growth in Asia is a by-product of a desire by regional central banks to smooth exchange rate movements. While concerns about “excessive” volatility of trade and foreign direct investment (FDI) may be well founded,<sup>101</sup> smoothing behavior by central banks should, over time, have no net impact on reserves. In practice, there does not appear to be any change in the volatility of Asian exchange rates against the U.S. dollar, before and after the crisis, although the crisis period itself was one characterized by very high volatility. Interestingly, there is also little difference between the extent of volatility of Asian currencies and that of Latin American currencies after 2003 (Figure 4.6), with the exception of Venezuela and Brazil, which show abnormally high volatilities.

An alternative argument for Asia’s reserve accumulation is that it stems from a desire to maintain relatively stable and competitive exchange rates so as to aggressively export their way out of the crisis and deep recession of 1997-98.<sup>102,103</sup>

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<sup>101</sup> See Calvo and Reinhart (2002), Rajan (2002), and references cited within.

<sup>102</sup> In addition, part of the change in reserves in U.S. dollar terms arises from “revaluation gains” due to the depreciation of the U.S. dollar against the major currencies in which reserves might be held, especially the euro.

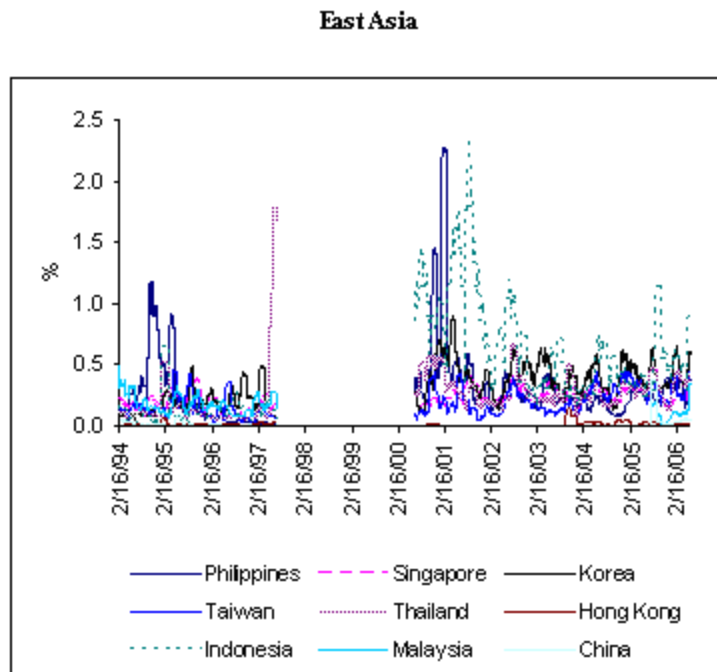
<sup>103</sup> While Aizenman and Lee (2005) argue against the mercantilist rationale for reserve accumulation in East Asia, the World Bank (2005) has observed:

Intervention was initially motivated by a desire to build up a buffer stock after the Asian crisis had depleted levels of reserves....(H)owever (r)apid reserve accumulation..continued through late 2004, as countries sought to limit the impact of heavy capital inflows on external competitiveness, at a time when domestic demand generally remained subdued (p.29).

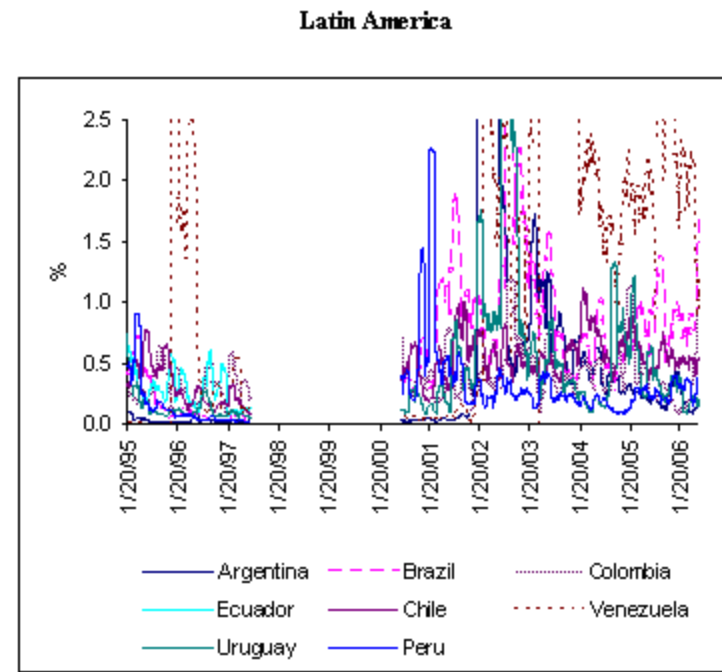
Similarly, the IMF (2004) has noted:

(M)onetary authorities seem to have been driven by a desire to prevent nominal exchange rate appreciation in the pursuit of export-led growth policies—especially in Asia and after the increase in inflows in 2003-04 (p.148).

Figure 4.6: Exchange rate volatility before and after the crisis has remained unchanged (30-day rolling standard deviation on growth of daily nominal exchange rates to US\$)



Source: Datastream; staff computations.



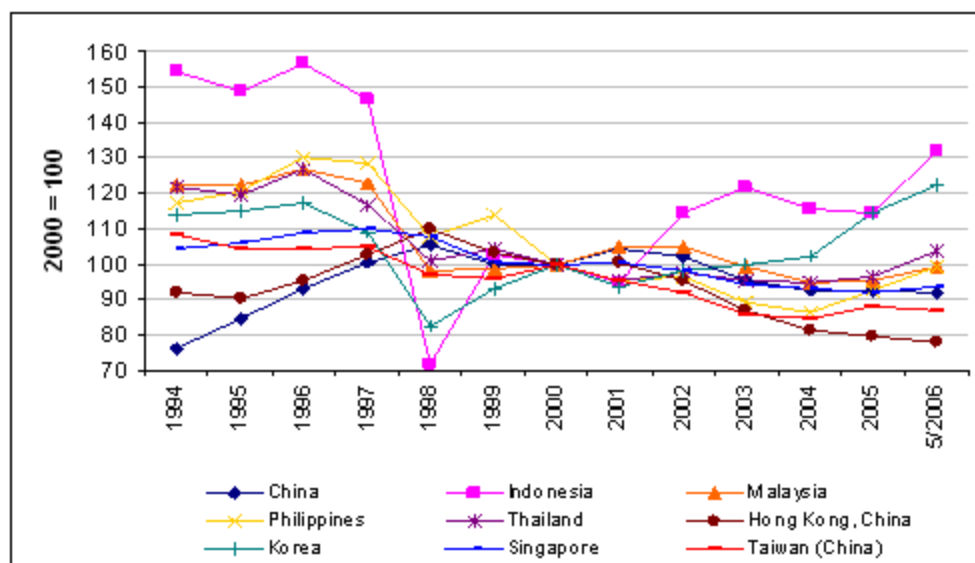
Source: Datastream; staff computations.

This argument, however, may only explain a part of the story. If it were true, one would expect reserve accumulation to be closely related to current account surpluses. The evidence does not support this. There is no direct correlation between reserve stockpiling and current account surpluses in East Asia. In fact, East Asia had a long history of rapid export growth without large reserve accumulation prior to the 1997 crisis. In addition, the argument would suggest that countries should target the real effective exchange rate, not the nominal bilateral rate against the U.S. dollar, to account for the fact that they trade with countries other than the USA.<sup>104</sup> And real effective rates in the region, including that of China, have been quite variable (Figure 4.7).

East Asian businesses too do not seem to put too much faith in their governments' ability to stabilize nominal exchange rates. There has been an explosion in the global growth of foreign exchange derivatives, largely traded on over the counter markets, and East Asia is thought to be responsible for about 15% of this trade, mostly in Hong Kong (China), Singapore, and Korea.

Since 2002, while the current account surplus still accounts for much of the reserve increase, the private capital account surplus in East Asia has accounted for a growing share of the region's reserve accumulation, especially for China (Table 4.4).<sup>105</sup>

**Figure 4.7: Effective exchange rates had fluctuated considerably during the last decade: Real effective exchange rates in East Asia, 1994-2006**



Source: IMF, *International Notice System* and *International Financial Statistics*.

<sup>104</sup> Goldstein and Lardy (2005).

<sup>105</sup> A significant part of the balance of payments surplus is, of course, driven by China. See Ouyang et al. (2006) and Prasad and Wei (2006) for details on the dynamics of the capital and current account balances in China.

**Table 4.4: Current and capital account surpluses, 2002-2005, US\$ billion**

	Current Account Balances				Net Capital Inflows**			
	2002	2003	2004	2005	2002	2003	2004	2005
East Asia	125.0	161.2	184.4	268.8	29.3	72.9	151.3	-27.6
China	35.4	45.9	68.7	160.8	40.1	71.1	137.7	46.2
S.E. Asia	27.2	30.8	27.1	21.8	-13.9	-12.8	1.8	-14.7
Indonesia	7.8	8.1	3.1	3.0	-3.8	-3.8	-3.1	-4.6
Malaysia	8.0	13.3	14.9	20.0	-4.3	-2.9	6.9	-16.2
Philippines	4.4	1.4	2.2	2.5	-4.5	-1.0	-2.8	0.3
Thailand	7.0	8.0	6.9	-3.7	-1.3	-4.9	0.7	5.7
NIEs	62.3	84.6	88.7	86.3	3.1	14.5	11.8	-59.1
Hong Kong	12.4	16.5	15.7	20.3	-11.7	-10.0	-10.5	-19.6
Korea	5.4	12.0	28.2	16.6	13.2	22.0	15.5	-5.2
Singapore	18.9	26.9	26.3	33.2	-12.3	-13.2	-9.8	-29.6
Taiwan, China	25.6	29.3	18.5	16.2	13.8	15.7	16.6	-4.7

\*\* Sum of all capital account flows plus errors and omissions. Derived as change in reserves less current account.

Sources: IMF, *International Financial Statistics*; Haver Analytics.

These various explanations of reserve accumulation have quite different policy implications. The precautionary approach links reserves accumulation directly to exposure to sudden stops, capital flight, and volatility, whereas the mercantilist approach views reserves accumulation as a residual of an industrial policy, a policy that may impose negative externalities on other trading partners.

A third explanation focuses on the different risk properties of foreign exchange reserves on the one hand, which are largely held in liquid, safe investments, and foreign portfolio capital which is risk bearing. As noted by McCauley “East Asian economies are grossing up their balance sheets systematically to transfer risk to the rest of the world and to build up liquidity.”<sup>106</sup> Some attribute this to a strategic positioning whereby countries with weak property rights, such as China, hold foreign exchange reserves as collateral to minimize concerns about expropriation.<sup>107</sup> But this view has been widely criticized, largely because of the mismatch between the location of reserves (in U.S. Treasuries) and the sources of FDI (largely regional).<sup>108</sup>

There are significant costs to regional economies from accumulating such high levels of reserves. These costs include the opportunity costs of capital, quasi-fiscal costs from monetary sterilization, and possible capital losses from exchange rate fluctuations. But there are also benefits from transferring risk to the rest of the world. As noted above, high reserve levels can significantly reduce the risk of capital reversals, and if a reversal were to occur, then high reserves would offer some protection to reduce the impact. One implication of this explanation is that once the desired level of risk sharing has been achieved, then reserve levels will level off, or grow in line with trade or other risk factors.

<sup>106</sup> See McCauley (2003), page 46.

<sup>107</sup> Dooley, Folkerts-Landau and Garber (2004).

<sup>108</sup> See Kamin (2005), Prasad and Wei (2005), Eichengreen (2005).

In an environment where capital account liberalization is just beginning, it is difficult to comment on whether foreign exchange reserves are excessive or not. If the ratio of all foreign assets (public and private) to GDP is compared across countries, developing East Asia does not appear to have any excesses, despite its relatively high level of public foreign exchange reserves. The inference is that East Asia's private sector is holding much less in foreign exchange than is expected for countries at similar income levels. This is perhaps because of regulations which have restricted the investment set of institutional investors in the region, such as insurance companies and pension funds. This implies that the issue for the region may be more to do with the balance of foreign asset holdings between the public and private sectors, than with the size of foreign exchange reserves themselves. The policy implication is that high foreign exchange reserves might reflect an underdeveloped institutional investor base; foreign assets will shift from the central bank to the private sector where they will be managed with a different risk-return perspective (Figure 4.8).

#### ***4.2.4 Regional financial cooperation***

Foreign exchange reserves provide some mechanism for reducing the risk of a sudden capital flow reversal, but may be an expensive option for achieving this goal. The region is looking for other options.

One significant development is the Chiang Mai initiative, established in May 2000 under the auspices of ASEAN + 3.<sup>109</sup> Under this agreement, central banks of 13 ASEAN + 3 countries have agreed to make available lines of credit to each other in the event of a crisis. Some 17 agreements have already been signed, totaling over \$40 billion. But the CMI is broader than just a line of credit. It now also provides for timely data provision and regional surveillance through regular exchanges, monitoring of capital flows, and training of key personnel. It is a clear statement of a desire to reduce the need for individual country self-insurance by creating a regional reserve-pooling mechanism (albeit for comparatively small amounts) and for creating an early warning mechanism to guard against financial contagion.

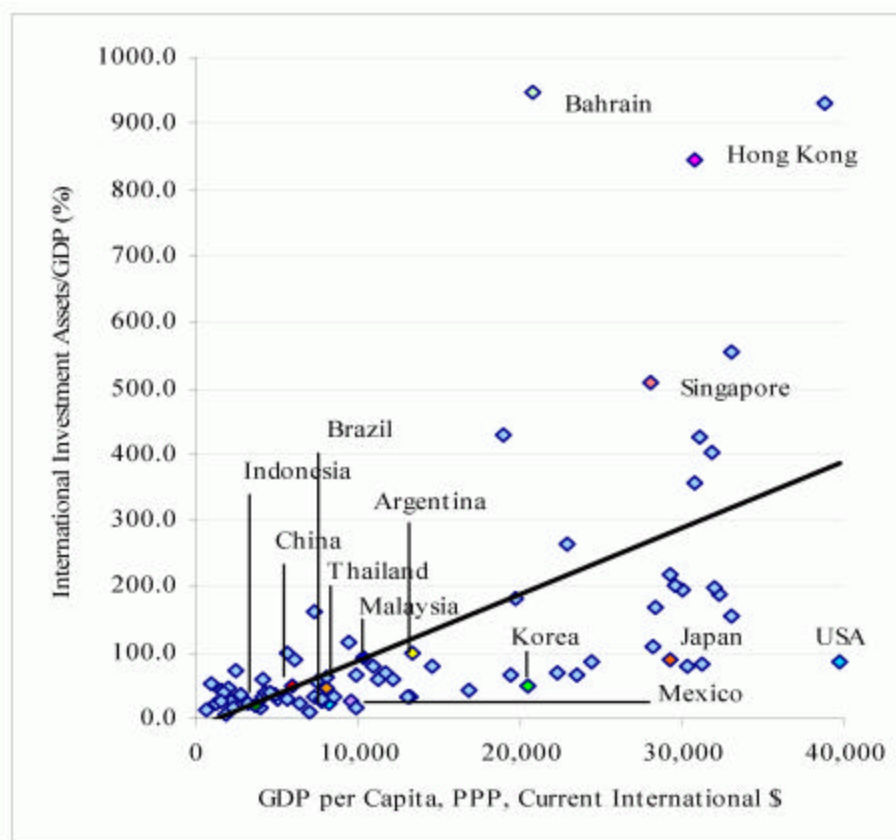
The development of a regional bond fund is another area of regional cooperation. Bond financing is considered to be more stable relative to bank financing. Diversification of funding sources to include international bond markets also adds to stability of flows. Under the Executives' Meetings of East Asia and Pacific Central banks (EMEAP), concrete measures have been taken to address weaknesses in Asian bond markets from the investor perspective and weaknesses in the process of issuance.

The first Asian Bond Fund involved the 11 member regional governments of EMEAP voluntarily contributing about 1 per cent each of their reserves to a fund dedicated to purchasing sovereign and semi-sovereign bonds denominated in U.S. dollars of 8 of the member countries. Australia, Japan, and New Zealand are only contributors to the ABF. The initial size of the ABF was about \$1 billion and the fund has been passively managed by the investment management unit of the Swiss-based BIS.

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<sup>109</sup> See Rajan (2006) and Rana (2002).

**Figure 4.8: East Asian holdings of foreign assets are not usually high: International foreign asset holdings and GDP per capita, 2004**



Sources: IMF, *Consolidated Portfolio Investment Survey*; World Bank, *World Development Indicators*.

In a noteworthy next step, a second Asian Bond Fund (ABF2) was established in December 2004. The quantum of funds involved was doubled in size (\$2 billion), and its mandate is to invest in selected domestic currency sovereign and quasi-sovereign bonds in the eight economies.

The ABF 2 comprises two components (\$1 billion each): (a) a Pan-Asian Bond Index Fund (PAIF) and (b) a Fund of Bond Funds (FoBF). The PAIF is a single bond fund, while the FoBF is a two-layered structure with a parent fund investing in eight single market sub-funds (Figure 14).<sup>110</sup> The funds are passively managed to match the benchmark index. The seed money for single bond funds has been divided on pre-determined criteria and local fund managers have been appointed to manage the respective funds. The specific criteria for market weights in each sub-fund (and distribution within PAIF) are based on: (a) the size of the local market; (b) the turnover

<sup>110</sup> The International Index Company (IIC), a joint venture between ABN Amro, JP Morgan and Morgan Stanley (iBoxx ABF), has created the benchmark indices for all nine funds.

ratio in that market; (c) the sovereign credit rating; and (d) a market openness factor. The market weights will be reviewed annually, with market openness being a particularly important factor in the allocation of weights. The parent fund is limited to investments by EMEAP member central banks only. While the initial phase of PAIF was confined to investments by EMEAP central banks only (\$1 billion), it was opened up to investments by other retail investors in Phase 2.

The ABF should help the region diversify from bank lending to bond financing by reducing the supply side constraints and introducing low-cost products, on the one hand, and by raising investor awareness and broadening the investor base on the demand side, on the other.<sup>111</sup>

Beyond the potential to recycle regional funds intra-regionally and obtaining a superior risk-return trade-off, the ABF initiative might also help lessen the extent of currency and maturity mismatches. Insofar as a narrow investor base is one of the reasons for the original sin problem that has afflicted developing East Asia,<sup>112</sup> regional integration measures like the ABF that enhance the investor base should help moderate this problem.

The combination of regional cooperation, self-insurance through foreign exchange reserve accumulation and greater access to international capital markets as well as syndicated bank credits suggests that East Asia is on its way to integrating more deeply with regional and global financial markets. But while regional cooperation can provide an impetus to diversification, most of the needed policy measures will have to take place in domestic financial systems. The next section discusses recent developments in these systems.

### **4.3 Towards more robust domestic financial markets**

Financial markets in East Asia have grown rapidly since the crisis. The sum of bank assets, equity markets and bond markets has reached US\$9.6 trillion equivalent (Table 4.5). By most international comparisons, financial depth in East Asian financial markets is above average relative to other countries with similar income levels. This applies to banking, equity, and even bond markets.<sup>113</sup>

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<sup>111</sup> Hamada et al. (2004), Leung (2005) and Ma and Remolona (2005) elaborate on this.

<sup>112</sup> See Mehl and Reynaud (2005).

<sup>113</sup> This section draws on S. Ghosh (2006) East Asian Finance.

**Table 4.5: Financial markets, especially securities markets, have surged since 1997**

	<b>Bank assets</b>				<b>Equity market capitalization</b>				<b>Bonds outstanding</b>			
	\$ billion		% of GDP		\$ billion		% of GDP		\$ billion		% of GDP	
	<b>1997</b>	<b>2005</b>	<b>1997</b>	<b>2005</b>	<b>1997</b>	<b>2005</b>	<b>1997</b>	<b>2005</b>	<b>1997</b>	<b>2005</b>	<b>1997</b>	<b>2005</b>
China	1,125.7	3,692.2	124.6	163.1	101.4	401.9	11.2	17.8	116.4	552.0	12.9	24.4
Indonesia	74.1	140.0	31.1	49.8	29.1	81.4	12.2	28.9	4.5	55.2	1.9	19.6
Korea	196.4	736.1	37.9	93.5	41.9	718.0	8.1	91.2	130.3	599.8	25.2	76.2
Malaysia	100.9	208.5	100.9	159.4	93.2	180.5	93.2	138.0	57.0	115.1	57.0	88.0
Philippines	46.5	62.2	56.1	63.2	31.2	39.8	37.7	40.4	18.5	36.1	22.4	36.7
Thailand	120.3	183.0	79.7	103.6	22.8	123.9	15.1	70.1	10.7	72.1	7.1	40.8
Hong Kong	361.6	790.1	205.1	444.6	413.3	1,055.0	234.5	593.6	45.8	82.9	26.0	46.6
Singapore	117.0	216.4	122.0	185.4	106.3	257.3	110.8	220.4	23.7	79.8	24.7	68.2
Total	2,142.5	6,028.5	94.6	149.5	839.2	2,857.8	37.0	70.9	406.9	1,593.0	18.0	39.5

Sources: IMF, *International Financial Statistics*; World Federation of Exchanges; BIS; ADB, *Asian Bond Indicators*; World Bank, *World Development Indicators*; and, staff calculations.

Significant financial market reforms have already taken place. Banks have been restructured and recapitalized and are now much sounder. Prudential regulations and supervision have been strengthened although there remain areas needing further strengthening, including on-site examination. Businesses also have healthier balance sheets, having deleveraged substantially since the crisis. At the same time, banks have expanded into consumer lending, thereby adding to their revenue base.

Yet there is still more to be done, particularly with the development of corporate bond markets. Banks are healthy precisely because they have reduced lending to many corporates without adequate credit ratings. And local capital markets are better suited to provide the patient capital that innovators require. A healthy corporate bond market would manage risk through higher pricing, rather than through lower volumes, and would help bring to the market a more diversified set of investors, including institutional investors who have yet to play a major role in capital market deepening in the region.

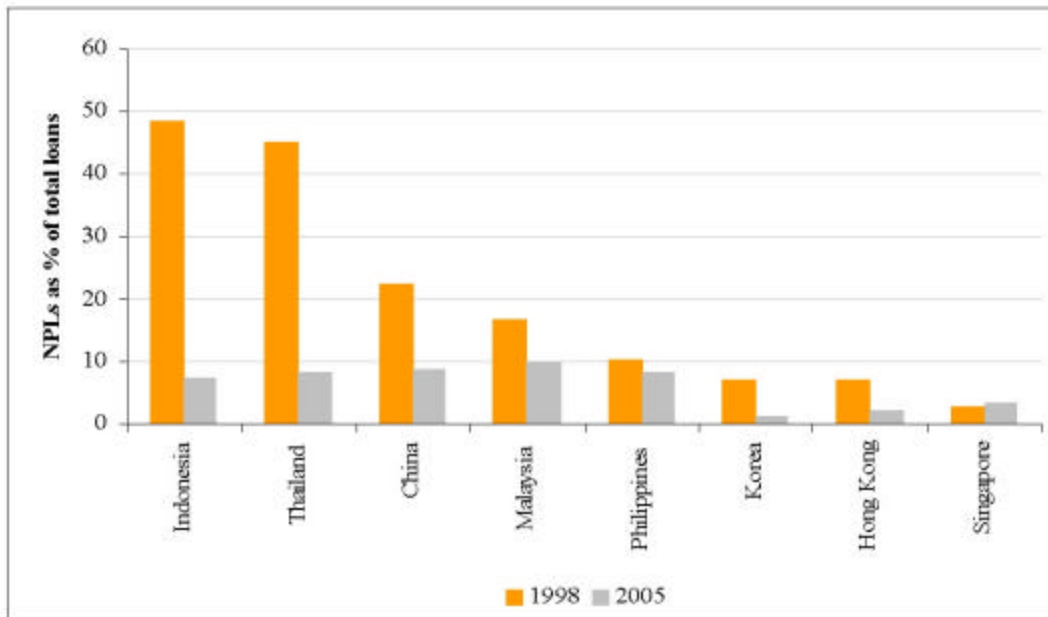
### **4.3.1 Banking**

The banking sector in East Asia is considerably healthier today than it was in 1997. There has been a trend towards consolidation of the sector, with the number of banks in each middle-income country falling, even as GDP has recovered, with the exception of China. Thus, there has been a very sizable increase in the median size of banks since the crisis. In several economies in the region (Hong Kong [China], Korea and Thailand), the size of an average bank is larger than in Germany, U.K. or the USA. Despite this, the industry is not more concentrated than before—there is no marked trend in the share of assets held by the top 3 banks. Another positive sign is that average state ownership in the top 10 banks has fallen, while average foreign ownership has risen.

With these changes, the efficiency of the system has improved. One measure of efficiency is the ratio of operating costs to total assets. This ranges between 1-2 percent for most countries in the region, with Hong Kong (China) banks having the lowest operating costs. Indonesia and the Philippines are exceptions with bank operating costs close to 3 percent of assets. These figures for the region are comparable with banks in Japan and Europe and significantly lower than the costs of banks in the United States, which average around 3 percent of assets.

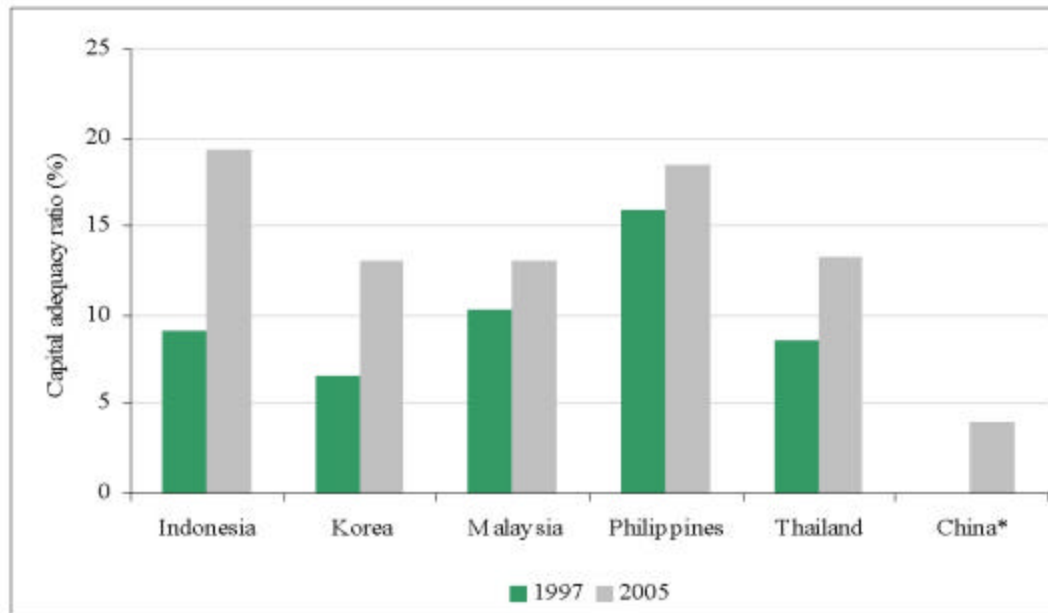
Low operating costs have permitted banks to improve their financial stability and soundness. The average level of non-performing loans has fallen to around 11 percent, although this still displays considerable variation across the region. Both Indonesia and Thailand which had peak NPL ratios of 48 and 45 percent in 1998, have brought their NPLs down to single digit levels by the end of 2005 (7.6% and 8.3% respectively). In Korea, the NPL ratio has fallen to just 1.2 percent. At the same time, all banks, except in China, have rebuilt their capital base and capital adequacy ratios in the region stand at around 14 percent, comparable to ratios of banks in emerging Europe and in Latin America (Figures 4.9 and 4.10).

Figure 4.9: Non-performing loans have shrunk since 1997



Source: Country sources.

Figure 4.10: Capital adequacy has also strengthened



\*China (2004)

Source: Country sources.

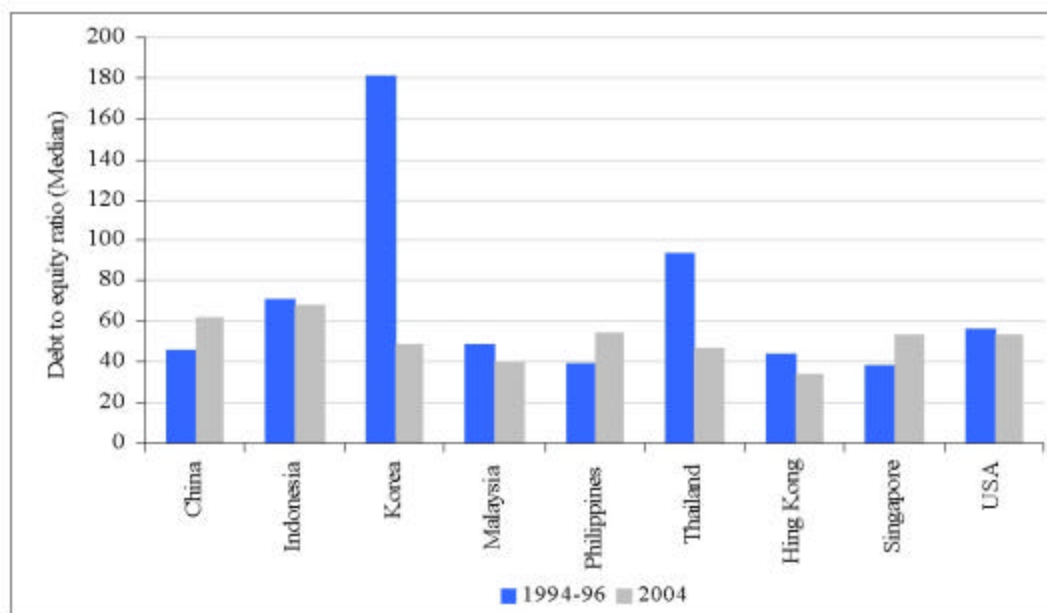
On the other side of the ledger, banks' corporate customers also have much healthier balance sheets than they did before the crisis. The most extreme example is Korea. Before the crisis, the average corporate borrower in Korea had a debt/equity ratio of 181, three times higher than an average borrower in the USA. Thailand and Indonesia were other countries where leverage was high (94% and 71%). By 2004, these leverage ratios had declined to 49% (Korea) and 47% (Thailand), but remained high in Indonesia (68%) (Figure 4.11).

There is a pattern in the region of some firms with very high debt levels, and these are the riskiest customers. But here too the trend is towards better balance sheets. The proportion of firms with debt/equity ratios greater than 200% has been halved in Indonesia, Thailand, and Korea since 2000.

Sound banks and healthy corporate balance sheets should be a recipe for solid credit expansion, but the reverse has happened in East Asia. The way in which banks have been improving their balance sheets has been by cutting back on credit, except to the best borrowers. Credit to the private sector is generally lower in the region, and an increasing share of this credit is going to consumers rather than to corporates. Thus, in 2004, consumer lending accounted for 53 percent of total credit in Malaysia, 49 percent in Korea, 40-50 percent in Hong Kong (China) and Singapore, 30 percent in Indonesia, 17 percent in Thailand, 15 percent in China, and 10 percent in the Philippines.

Clearly the banking system in East Asia is changing its nature. The provision of credit to the corporate sector is no longer the principal activity of banks. They have diversified to lending to households. They have also engaged in a number of investment banking

**Figure 4.11: Corporate leverage has declined since the mid-1990s**



Source: Country sources.

activities on which they earn fees and trading income. While this makes for sounder banks, it suggests that the era of easy credit to firms which make up the production network has passed. Firms must meet a more stringent test of financial market discipline.

### **4.3.2 Securities markets**

Securities markets—equities and bonds—have grown strongly in the region since 1997. Stock market capitalization has almost tripled to US\$2.3 trillion in 2004. Bond markets add another US\$1.5 trillion. Measured as a share of GDP, the region's capital markets appear to be sizable.

This impression is reinforced by looking at the amount of capital raised. In 2004, US\$66.6 billion in new equity was raised, half through initial public offerings. By contrast, only US\$4.6 billion was raised in emerging Europe and US\$0.66 billion in Latin America.

These aggregates disguise the varied performance of securities markets across the region. At one end, Singapore and Hong Kong (China) have well developed markets. In the middle, Korea and Malaysia have also deepened their markets and now have relatively large bond markets as well. Thailand has seen one of the most rapid growth rates of its bond markets, but much of this reflects the issuance of government and financial institutions' bonds to meet the costs associated with recapitalizing banks after the crisis. Indonesia, the Philippines and China have significantly weaker systems which do not provide significant finance to their corporate sectors.<sup>114</sup>

Part of the problem is that investors' tolerance for risk in the region appears to be low. Even in countries with large bond markets, like Malaysia and Korea, most issuers have excellent credit ratings. In Malaysia, 80% of issuances have AA or better credit ratings. In Korea, 80% of issues are rated A or better. Many issuers are quasi-government firms who enjoy explicit or implicit guarantees and therefore have the highest credit quality available domestically.

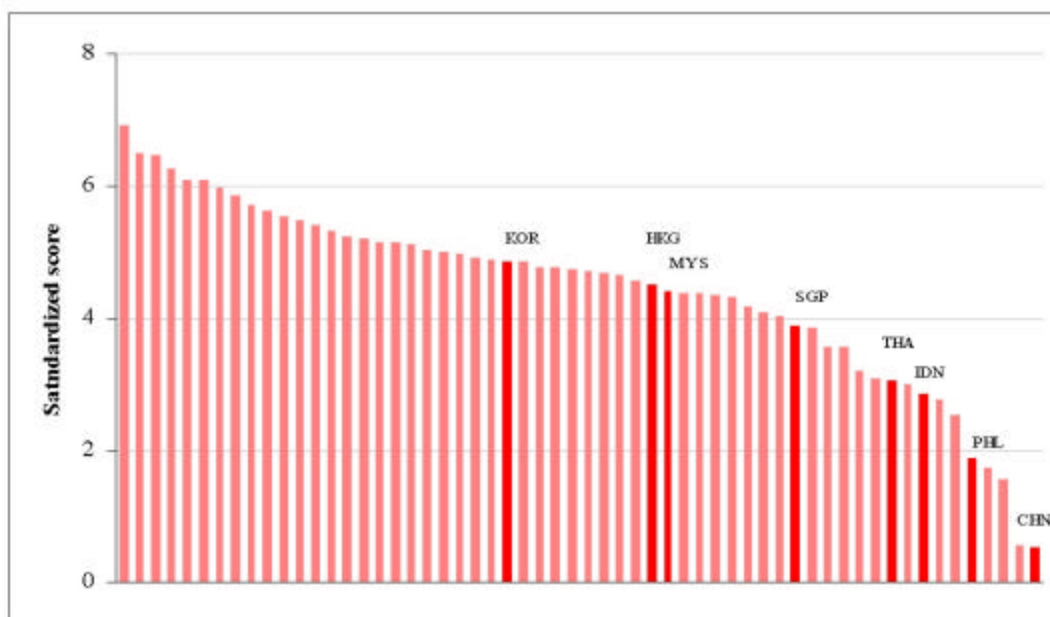
For smaller corporates, the result is that they cannot access securities markets effectively. With small size, liquidity in their paper is low. Transaction costs can also mount as a fraction of the amount of capital being raised. Firms must pay management fees for structuring the transaction, credit rating agency fees, registration, and other documentation associated with disclosure rules, as well as underwriting fees, legal fees and taxes. Not surprisingly many firms find themselves squeezed out of the market.

Figure 4.12 shows a composite measure of the efficiency of equity markets in the region against other countries. Korea, Hong Kong (China), Malaysia and Singapore fare reasonably well in global terms, while Thailand, Indonesia, the Philippines, and China do quite poorly.

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<sup>114</sup> See Gyntelberg, Ma and Remolana (2006).

Figure 4.12: Equity market efficiency can be improved



Source: Swati Ghosh, *East Asian Finance*, (2006)

The efficiency measure captures transaction costs as well as the extent to which the price of the equity reflects firm fundamentals rather than general market sentiment. It therefore provides a measure of the effectiveness of the market in generating useful information, based on a large number of perceptions. If transaction costs are high, then trading is reduced and small changes in information will be ignored, reducing the efficiency of the market.

The key determinant of efficiency is liquidity. Liquidity shrinks the gap between bid and offer prices. It permits most trading to occur without a worry that prices will be affected by the trade itself, giving investors confidence that they can buy or sell at a specified market price. And it ensures that the market will return to normalcy if it gets disrupted by an imbalance in orders or other shocks. Without liquidity, the market cannot develop.

It is common to describe East Asia as a region with high liquidity because of the sizable amount of domestic savings that are generated. But this does not translate into better securities market performance because of deficiencies in information to price accurately, high transaction costs, including underdeveloped market infrastructure in some places, and a lack of a diversified investor base, especially of the insurance companies, pension funds, and mutual funds who manage large amounts of long-term capital best suited for securities markets.

## 4.4 Conclusions

Looking ahead, development of the corporate bond market remains the priority for policy makers in creating a more diversified, robust capital market in the region.

### 4.4.1 *Financial structure and firm performance*

Securities market development to diversify East Asia's financial markets is important because the structure of finance can influence firm performance. Firms tend to behave differently when they fund themselves through bank credits or through securities markets. There is increasing evidence that more innovative firms prefer to finance themselves on securities markets.

Innovative activity requires a high degree of trust on the part of financial investors. Innovations take time to implement, with returns accruing far into the future. They are risky in that they imply venturing into uncharted waters. Many innovations fail, but the ones that succeed have high returns. Firms that are successful innovators have to know when to admit to failure and cease spending money on a project, as well as when to keep going. Managers cannot be fully trusted to make these decisions as they face different incentives from shareholders. Shareholders bear the costs of failure, while managers reap many of the benefits from success.

Bank credits are typically associated with significant monitoring by banks of the management of their client borrowers. This type of relationship lending is founded on the principle that banks know the business in which their customers are operating, and because of this information they can make a judgment as to the business prospects of their clients. The willingness of banks to extend credit is tied to a continued updating of their judgment about the firm.

For small incremental innovations, bank lending can be efficient. The bank is able to adequately appraise the new technology. It monitors the speed of research and the process of application and if the project appears to be moving too slowly, jeopardizing future benefits, the bank can pull back its credit and force the firm to stop. Because banks can adapt quickly to changes in a firm's prospects, they can afford to lend greater sums. A higher debt/equity ratio for the firm in turn means that free cash flow is reduced and that managers must constantly seek approval before moving forward with a new project.

But when innovations are more significant, banks can be too conservative. They may not have the skills to properly evaluate whether a new technology is likely to be successful. They might terminate projects prematurely because they do not wish to take on too much risk by extending ever more credit to firms. In these circumstances, arm's length financing from capital markets is preferred.

Capital markets bring together a range of investors who can have large differences of opinion on the likely success or failure of an innovation. This increases the likelihood of a firm finding some groups of investors who believe in their new technology. Capital markets provide more long-term capital, and they permit greater management discretion.

If equity is raised, rather than public debt, then there is greater cash flow and the firm has more time to prove the success of its innovation.

Thus, bank credits can support incremental innovation, while capital markets are better suited to support more radical technological change.

These arguments are borne out by empirical evidence from developed countries. In the United States, firms that rely more on public financing receive a larger number of patents. These patents tend to be more valuable, as indicated by the frequency with which they are cited by others.<sup>115</sup> Changes in the financing structure of firms appear to be related to large changes in their value because of the impact on the rate of innovation.

In general, a broader financial structure supports the financing of a broader array of new innovations and so supports technological progress. As constant innovation is critical for members of a production network, a broad, diversified financial system is desired.

#### ***4.4.2 Financial markets must manage risk***

Financial markets mobilize resources and allocate risks. In the East Asian context, the focus has shifted to the process of risk allocation. As the real economies in the region become more integrated, there has been a premium on stability. The region seems less vulnerable than before to sudden shifts in investor sentiment as the structure of financing has shifted towards FDI, the maturities of liabilities have lengthened and financing sources have become more diversified to include important regional economies. As IMF (2006) notes:

Regional economies are now more resilient to a sudden reversal of inflows than a decade ago, because their economic fundamentals have improved, and because exchange rates in the majority of economies are more flexible. Furthermore, risks to the banking systems in the region have diminished because only a small portion of the flows, this time, have been intermediated through banks, leaving their balance-sheets largely unaffected. However, not all economies have moved at the same pace in reducing domestic and external vulnerabilities. Some economies still possess underlying weaknesses, which leave them vulnerable to a sudden reversal of capital flows that can be brought by changes in sentiment and international financial conditions.<sup>116</sup>

But these successes have had their costs. Countries in the region have moved rapidly to building up their defenses against major foreign exchange movements and conquering the “fear of floating.” In some instances, they may even have moved too far. Rodrik has concluded that “developing countries have responded to financial globalization in a highly unbalanced and far from optimal manner. They have over-invested in the costly strategy of reserve accumulation and under-invested in capital account management

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<sup>115</sup> Atanassov, Nanda, and Seru (2005).

<sup>116</sup> In addition, while there has been a better matching in the current composition of assets and liabilities in the developing East Asia region, this is largely due to an accumulation of reserves in foreign currency terms. It is important to ensure that individual corporates and financial institutions take appropriate care to manage the risks associated with these currency mismatch risks.

policies....”<sup>117</sup> The region is trying to address this imbalance through enhanced regional cooperation. It does appear, however, that the foreign exchange risks that could undermine regional production networks have been curtailed.

Credit risk remains a major obstacle in the region. Banks have cleaned up their balance sheets by reducing their exposure to the corporate sector, especially small firms. Capital markets have not developed rapidly enough to offer a viable alternative source of funding. Lack of public capital can be especially detrimental to innovation. The priority for the region is to develop equity and bond markets to permit better risk sharing at home and abroad.

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<sup>117</sup> See Rodrik (2006), page 12.

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