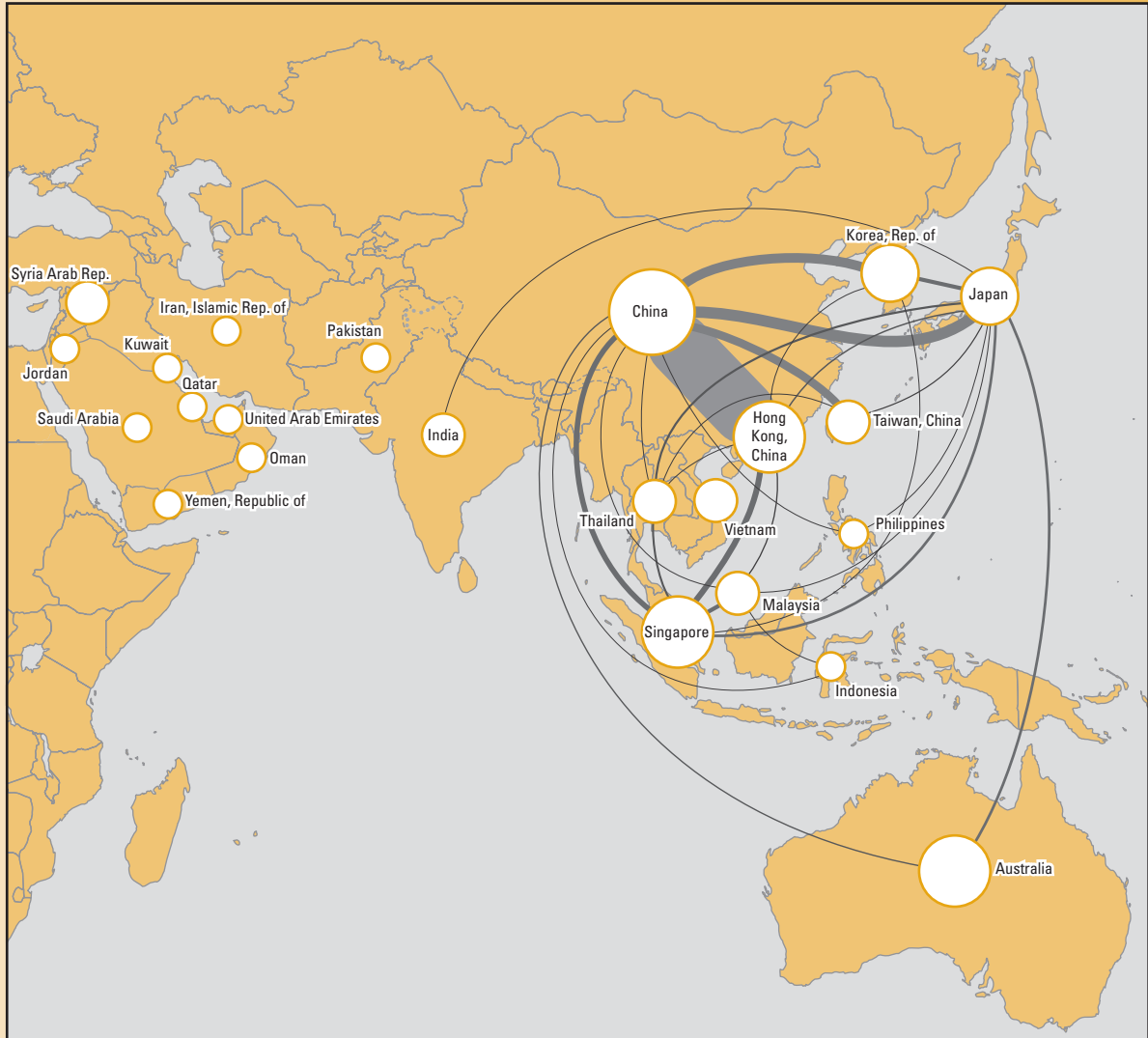


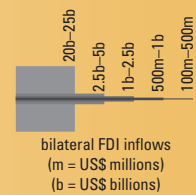
Map 4.1 Investment Flows within East Asia Are Important



○ total FDI (US\$ billions)



The area of each circle is proportional to the annual average FDI inflows from the entire world into each country, in the 2000-04 period.



Each band is proportional to the annual average FDI inflows in both directions for each pair of countries, in the 2000-04 period (or available years within that period).

Source: World Bank staff estimates.

The challenge of stability is being met as financial sources diversify, but financial structures are better suited to financing trade, not innovation. Corporate bond markets are underdeveloped.

FINANCE

From Breakdown to Buildup

The financial structure underpinning the rapid economic growth and the trade in East Asia failed in 1997–98. The massive economic dislocation and loss of market value among firms highlighted 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, the focus has shifted since the crisis 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 only on each country's efforts and financial structures, but also on how the financial links between countries operate.¹ This chapter looks at how the structure of finance in the region is changing and considers the remaining challenges for the establishment of a system that is able to support the sort of trade and innovation that are necessary for continued rapid growth in the middle-income and rich countries of the region.

Map 4.1 shows that the economies in the region are increasingly becoming linked by foreign direct investment (FDI). Hong Kong (China), Japan, the Republic of Korea, Singapore, and Taiwan (China) all have links with each other, as well as with China. China is, of course, the dominant recipient of FDI from the region, which is to be expected given the size of its

economy, but Malaysia, the Philippines, and Thailand also have strong FDI links across the region. Only Indonesia, which was a main target 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 ties through FDI and the resilience of these flows contrast with the falling share of FDI from Europe and the United States. At the same time, crossborder 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, the value of domestic financial assets—bonds, equities, and bank deposits—has surged since the crisis, reaching US\$9.6 trillion. This raises the two related questions that 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 shift?
- How have East Asian domestic financial markets changed since the crisis?

How Finance Supported Production Networks Before 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 examine how the needs of the real economy have changed, particularly the financial requirements of production networks.

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

As production chains become more complex, the potential risks within the system also become more complex. Global or regional production networks operate internationally and therefore rely on a broad array of crossborder financial services. They are exposed to currency risk when the cost structures of different components are dependent on local currency wages. Because most trade is denominated in U.S. dollars and because the United States is the most important end consumer of the output of Asian production networks, financing throughout the network is best undertaken in U.S. dollars. When it is not, a currency risk arises. A movement in local currencies against the U.S. dollar may 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 governed by different contractual agreements between one another. Affiliates, subsidiaries, original equipment manufacturers, and other types of related companies, some big and some small, may all be engaged in a network. Each transaction within this chain of producers carries a credit risk.

As became abundantly clear in 1997–98, currency risk and credit risk may combine and accumulate.

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

The interlinked system of FDI and international bank lending proved adequate so that production networks could be expanded throughout East Asia. FDI provided the equity capital required to build new plants and fund innovation where needed. It was used primarily in middle-income countries such as Indonesia, Malaysia, and Thailand, where domestic capabilities were less strong. In Korea and Taiwan (China), which had more restrictive foreign exchange regimes, offshoring took place through commercial arrangements. Japanese multinationals used their own credit standing to mobilize the resources to invest abroad, mostly relying on banks in their home country.

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 on the credit risk represented by the suppliers in the chain since they knew that the credit of the buyer was sound. Traditional commercial banking products such as letters of credit acted as the mechanisms for such transactions. International banks could minimize their risk by intermediating their funds through local banks, which had better information on the credit standing of suppliers and which might more easily monitor management in the diverse companies within the supply chain.

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

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

The 1997–98 Crisis

There have been many descriptions of the East Asian crisis, and many factors came into play. Here, it is useful to mention a few facts. First, East Asia suffered from a major capital reversal during the crisis. As Sheng (2006) notes, roughly US\$200 billion flowed into emerging East Asia in the five years prior to 1997.² Over the next two years, about US\$160 billion left the region. Much of this outflow may 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 per 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. Because almost 80 percent of the international loans of these banks 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 growth in international capital markets. In addition to bank lending, portfolio flows from abroad had risen steeply in the mid-1990s in response to rising local equity markets. Equity financing was attractive to many firms in the region because it freed them from the surveillance of banks and multinational firms. With less scrutiny by lenders, local firms were able to venture into areas other than production networking, including more speculative real estate development. This reaction was not limited to firms. Local banks, too, used the opportunity offered by the available foreign financing to shift to the financing of nontradables. Agency problems proliferated.

Portfolio flows are traditionally more volatile than bank credits. But they may also increase the possibility 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 so as to protect the value of their medium-term claims. When portfolio flows replace medium-term bank 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 rises as the structure of finance becomes more varied.³

A third important observation is that, at the time of the crisis, the supervision of local banks was weak, and the credit culture in economies that were hit the most severely by the crisis was generally considered poor. The leverage of corporate borrowers had risen to high levels, and the exposure to firms with interest coverage ratios at less than 1 was significant. The monitoring and oversight function that is supposed to be associated 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:

- A need for a more reliable mechanism to ensure foreign exchange predictability
- A need for more effective mechanisms to price credit risk
- A need for more thorough corporate governance so as to reduce agency problems

East Asian policy makers discovered to their cost what theoretical economists had already foreseen. They tried to shift toward capital account convertibility to ease the flow of capital and dividends and 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 maintain growth. These three desirable goals 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.

The Pattern of Global and Regional Financial Integration

Since the crisis, the nature of international capital flows in East Asia has changed perceptibly. The levels of FDI, in aggregate, have been relatively stable, but the composition has shifted markedly. Much more FDI now originates within East Asia than was the case prior to the crisis. At the same time, the number of FDI sources has grown, with Hong Kong (China), Japan, Korea, and Taiwan (China) 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 the stock of FDI inflows, plus the stock of FDI outflows, divided by gross domestic product (GDP)—shows that foreign investment is more

significant in the region today: the index rose from 10 percent in 1990 to 28 percent in 2004.

Other flows to the region have been more volatile, especially those going 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: the push factors determine the timing and magnitude of capital flows to emerging economies, and the pull factors determine the geographical distribution of the flows.⁴

The biggest change in the region's financial integration, however, revolves around the accumulation of foreign exchange reserves and the management of foreign exchange risk. The stock of reserves had increased to over US\$1.6 trillion by the end of 2005, and there was every indication of a continuing upward trend despite the fact that countries had moved to more flexible exchange rates, at least *de jure*. But, at the same time, East Asian economies have begun to cooperate regionally on financial matters under the auspices of the Association of South-east Asian Nations, plus China, Japan, and Korea (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 only within the region. Table 4.1 shows these trends in foreign capital flows.

■ TABLE 4.1 Trends in Capital Flows to Emerging East Asia, 1990–2005

US\$ billions

Emerging East Asia	Average, 1990–95	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Net direct investment	27.0	51.9	54.7	54.4	64.0	58.3	43.6	42.3	59.7	50.5	74.0
Net portfolio flows	7.8	17.0	0.4	4.0	31.8	11.6	–68.1	–72.4	–16.9	–14.2	–16.2
Other net capital flows	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
Memo items											
Stock of FDI	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

Sources: International Financial Statistics Database, International Monetary Fund, <http://ifs.apdi.net/imf/>; UNCTAD 2005; World Bank staff calculations.

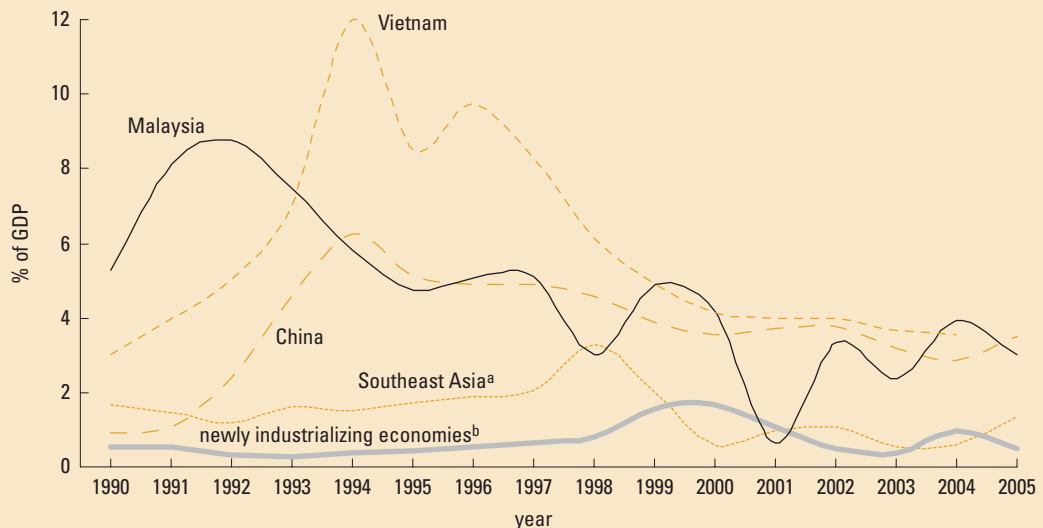
Note: For a definition of emerging East Asia, see endnote 2.

Foreign Direct Investment

FDI has been important for capital formation and upgrading technology across East Asia. 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 whereby foreign producers jump trade barriers so as to reduce their costs of accessing a domestic market. These costs may arise from a variety of trade frictions, such as tariffs, distance and transport costs, time to market, or the costs of providing customer services. Horizontal FDI is trade reducing.

Figure 4.1 shows the level of gross FDI inflows across East Asia. Like trade, both inflows and outflows of FDI may yield benefits. Gross inflows show the degree to which foreign management and technology are 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 the net levels of FDI, as given in balance of payments statistics, but on the gross levels.

■ FIGURE 4.1 FDI Is Important in China, Malaysia, and Vietnam



Sources: World Development Indicators Database, World Bank, <http://www.worldbank.org/data/datapubs/datapubs.html>; Global Development Finance Database, World Bank, <http://www.worldbank.org/data/datapubs/datapubs.html>; UNCTAD 2005.

a. The line represents a simple average of Indonesia, the Philippines, and Thailand.

b. The line represents a simple average of Korea and Taiwan (China).

Figure 4.1 shows a high level of FDI across East Asia, averaging 4 percent of GDP. The latecomer middle-income economies have relied particularly heavily on FDI. Malaysia showed inflows reaching above 8 percent of GDP in the early 1990s before seeing FDI taper off. China and Vietnam are currently the largest destinations for FDI relative to the size of their economies. Korea and Taiwan (China), on the other hand, historically implemented strategies that did not rely on FDI. The trailing off of FDI in Indonesia, the Philippines, and Thailand is of more concern. These economies had FDI inflows of 2–3 percent of GDP before the crisis, but show much lower levels now.

In aggregate, FDI flows 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 collapsed only in Indonesia, where a radically new business environment caused investors to rethink their long-term strategies and their exposure. Indonesia received 25 percent of Japanese FDI to emerging Asia in 1992, but only 3 percent in 2004. In some countries, such as Korea and Thailand, the level of 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 crossborder mergers and acquisitions in emerging East Asia accounted for inflows of US\$3 billion in 1996. By 1999, the figure had risen to US\$22 billion mainly because foreign firms were purchasing distressed assets from the banking sector. Mergers and acquisitions represented 30 percent of all FDI in 1999.

FDI based on mergers and acquisitions has tended to be concentrated in the nontradable services sectors, such as wholesale and retail trade services, real estate services, and financial services. This sort of FDI has an impact on the economy that differs from that of greenfield investments in manufacturing for export. Nevertheless, it has contributed to raising productivity in some less efficient sectors.

More recently, the composition of foreign investment has changed. A rising proportion of FDI is sourced from the region. Hong Kong (China), Korea, Singapore, and Taiwan (China) are becoming important investors, although 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 4.1, is good evidence that regional production networks are flourishing. The coexistence of this increased FDI with greater intraregional trade suggests that most FDI is vertical.⁵ This provides additional evidence that production networks are expanding.

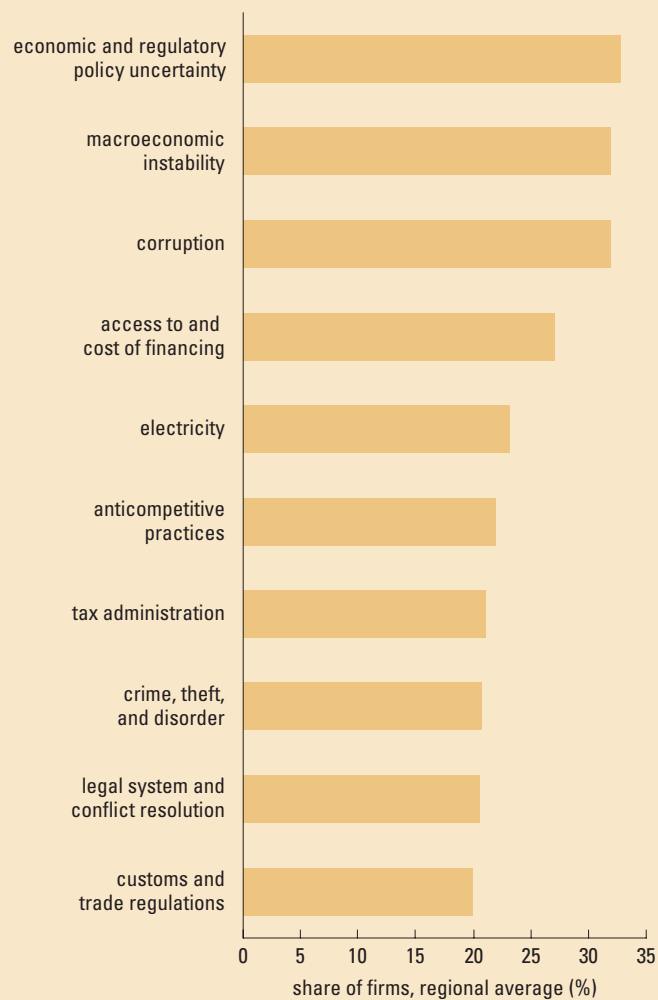
Production networks may be global in principle, but, within East Asia in practice, they are regional. Geographical proximity appears to be a significant determinant of FDI location, other things being equal. Market size also appears as significant. A survey of Japanese investors discussed in a 2005 white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

FDI is emphasized because it has long been considered a source of technology transfer, as well as capital. One study, based on surveys among firms and controlling for other factors such as firm age, sector, and size, finds that total factor productivity is significantly higher in Indonesia, Korea, the Philippines, and Thailand when a firm is foreign owned.⁶ Furthermore, when foreign ownership is in a majority, the productivity gains are highest, suggesting that management control provides greater incentives and enhances the 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.

In general, the policy environment 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), the availability of skills, 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 the relevant reforms are important if the middle-income countries are to continue to be competitive with lower-cost producers such as China and Vietnam (see figure 4.2.).

It is worth emphasizing that management in about 20 percent of firms in East Asia feels that access to finance is a major or very severe obstacle. In China, Indonesia, and Thailand, the proportion is somewhat higher among exporters than it is among nonexporters. However, these perception data should be interpreted with caution. The fact that a small fraction of firms in Cambodia report major obstacles in obtaining access to finance is probably more telling about the serious nature of other problems facing Cambodian firms than about ready access to finance (see figure 4.3).

■ FIGURE 4.2 The Constraints Most Frequently Cited by Firms



Source: World Bank investment climate surveys, <http://iresearch.worldbank.org/ics/jsp/index.jsp>.

Note: The figure shows the percent of firms identifying a problem as “major” or “very severe.” The following investment climate surveys have been used in composing the figure: Cambodia (2003), China (2002, 2003), Indonesia (2003), the Philippines (2003), Thailand (2004), and Vietnam (2005).

■ FIGURE 4.3 Access to Finance Is a Problem for Exporters and Nonexporters



Source: World Bank investment climate surveys, <http://iresearch.worldbank.org/ics/jsp/index.jsp>.

Note: The following surveys have been used in composing the figure: Cambodia (2003), China (2002, 2003), Indonesia (2003), the Philippines (2003), Thailand (2004), and Vietnam (2005).

Other Capital Flows

While international bank credit naturally followed the trends in FDI during the early stages of the development of production networks, it has become less important today. This is partly a consequence of greater financial openness. It is not surprising that countries with high levels of trade should also move toward greater financial openness. Capital controls become difficult to enforce when trade flows are large: export underinvoicing and import overinvoicing are expensive to monitor. Some analysts have put weight on the effect of the political economy.⁷ Closed, repressed domestic financial sectors may act as a mechanism to protect domestic players against new entrants and competition. But, in an open trade regime, there is already competition from abroad; so, protection against domestic entrants is less a concern. In such an environment, most countries in East Asia

sought to liberalize their capital accounts even after the crisis. The temporary controls introduced by Malaysia have been lifted. China is also gradually liberalizing.

Most analysts have concluded that the reduction in trade credit lines at the time of the crisis was greater than the extent justified by the fundamentals and the risks involved.⁸ They attribute this to leverage issues, which make banks risk averse, and to broad exposure rules. When country exposure ceilings are reduced by the management of international banks, there is no differentiation among instruments. The nonrenewal of short-term trade finance instruments is the most convenient path to compliance.

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

Given these structural weaknesses in international credit, it appears likely that the risk of sudden capital reversals is one with which countries must reckon, especially if they are heavily dependent on bank credit, as is true for most middle-income countries.⁹ General prescriptions, such as ensuring sound macroeconomic policy and a healthy domestic banking system, remain important components of any 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 are able properly to price risk. As a result, risk management takes the form of changes in the volume of the credit extended. This line of argument suggests that a more effective integration of domestic capital markets would be beneficial. But should this integration be global, regional, or both?

As a practical matter, 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 note the related effect of geographical distance, as in the case of trade models. They argue that both trade in goods and investments in foreign assets generate valuable information that reduces transaction costs. The implication is that countries with more trade will also tend to experience more crossborder asset flows. This has been confirmed econometrically by Aviat and Coeurdacier (2005) and Aizenman and Noy (2005).

There is also direct evidence that intraregional foreign portfolio investment is increasing. According to the coordinated portfolio investment survey of the International Monetary Fund, the value of the foreign portfolio investment in

■ TABLE 4.2 East Asia NIEs Have Replaced Japan as the Regional Source of Portfolio Finance
percent

Portfolio Investor	1997	2001	2002	2003
United States	41.4	37.0	37.4	37.0
European Union	27.3	34.2	28.5	30.9
Japan	12.7	6.3	6.6	4.3
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: World Bank staff estimates based on the Coordinated Portfolio Investment Survey Database, International Monetary Fund, <http://www.imf.org/external/np/sta/pi/cpis.htm>.

stocks and bonds that is coming into East Asia rose from 9 percent of the region's GDP in 1997 to 14 percent in 2003. Notably, the share of the portfolio investment originating from newly industrializing economies (NIEs) in East Asia more than doubled between 1997 and 2003 (see table 4.2).

By 2004, the East Asian NIEs held a larger share in absolute value terms in the equity and bonds in developing East Asian countries than did the European Union, Japan, or the United States. Unlike the developed countries, a much greater share of the portfolio investments of the NIEs are tied up in the developing countries of the region (see table 4.3).

■ TABLE 4.3 NIEs Are the Most Important Portfolio Investors in Developing East Asia
US\$ billions

Investor	1997	2004
Equity, total	32.6	122.0
NIEs	6.0	37.9
European Union	8.1	36.7
United States	14.4	32.4
Japan	2.0	4.9
Bonds, total	40.2	67.0
European Union	7.9	19.2
United States	17.2	10.8
Japan	10.0	3.7

Source: Ghosh 2006.

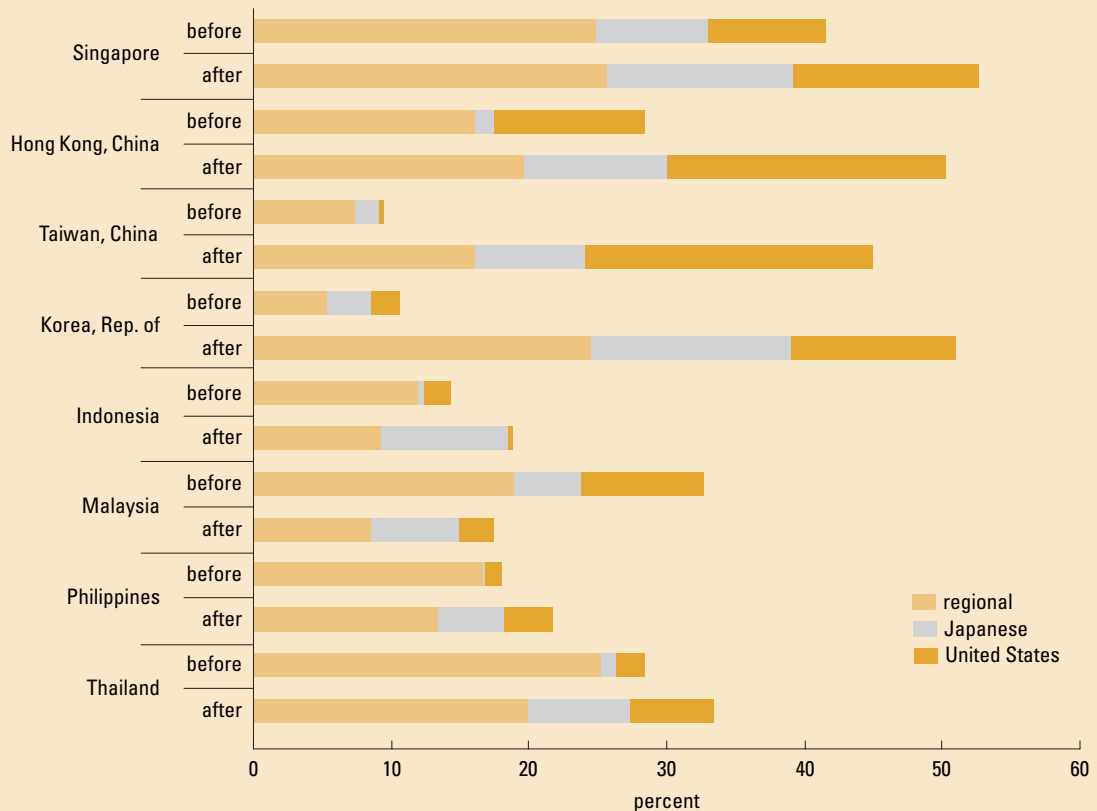
Another way of looking at integration is to estimate econometrically the movement of equity returns in a country with equity movements in another country or region. The closer the movements, the more one may claim that equity markets are integrated. This is the approach used by Beale et al. (2004) for Europe and by Kharas, Aldaz-Carroll, and Rahardja (2007) for East Asia. Kharas, Aldaz-Carroll, and Rahardja look at how equity returns in middle-income countries in East Asia compare to a regional average of equity returns (excluding the dependent country), equity returns in Japan, and equity returns in the United States. Using weekly data, they do this for two periods: before the 1997–98 crisis and after the crisis. They find that some East Asian countries are closely integrated with regional markets and that the degree of integration is approximately the same as that found by Beale et al. for the euro area. On average, postcrisis, the equity markets in East Asia are showing greater integration with the region, as well as with Japan and the United States.¹⁰ Figure 4.4 shows the correlations.

Foreign Exchange Reserve Accumulation

Emerging East Asia has over US\$1.6 trillion dollars in foreign exchange reserves; almost all of it has been accumulated since the crisis. This has occurred despite an ostensible move in the region toward more flexible exchange rates. The pattern of accumulation is the same across most countries, including Japan (see figure 4.5). The region as a whole accounts for about one-half of global reserve accumulation in the world.¹¹ While China and Japan have been the drivers behind this trend, the reserves of Korea and the other NIEs have also swelled significantly since the crisis.¹² In Korea and other economies that were hit by the crisis, policy makers have decided to amass reserves as a precaution and for self-insurance against future financial crises.¹³

The precautionary or financial safeguard motive for the accumulation of reserves is consistent with modern, second-generation models of currency crises, such as those developed by Obstfeld (1986, 1994). These models emphasize the possibility of multiple equilibriums in a world of substantial capital mobility, whereby a country's underlying payments position is neither strong nor hopelessly weak, that is, where it is vulnerable. In such circumstances, the level of reserves not only influences a country's ability to finance speculative runs on its currency, but may also have a bearing on the probability that runs will occur. Large levels of own liquidity may be especially necessary in the absence of acceptable programs of international lenders of last resort, such as those developed by the International Monetary Fund, or in the face of untested regional programs of monetary cooperation.¹⁴

■ FIGURE 4.4 Return Volatility Explained by Regional, Japanese, and U.S. News



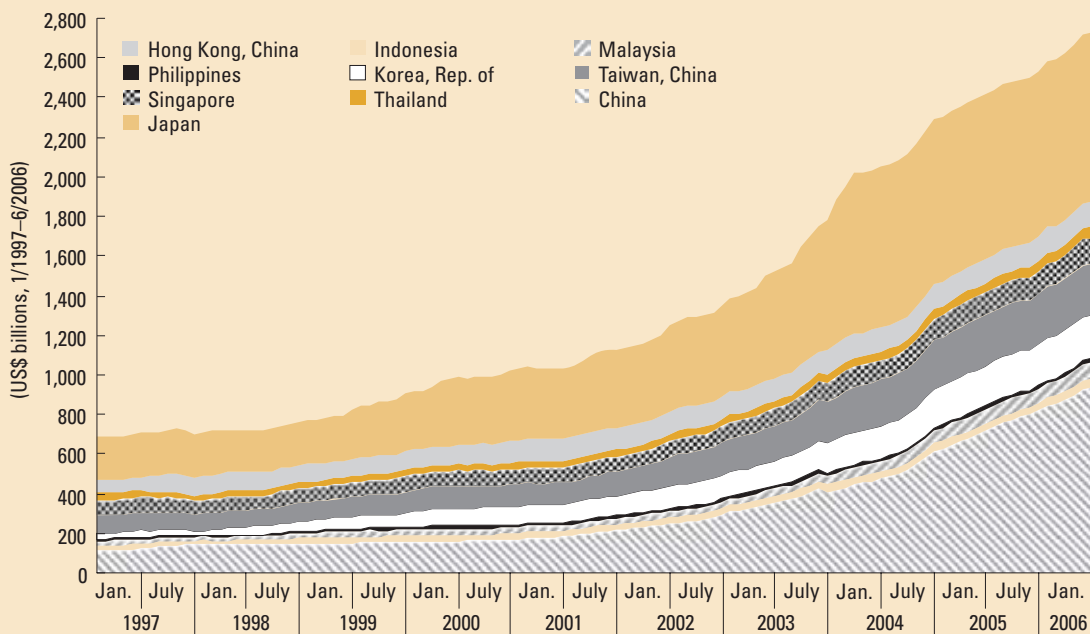
Source: Kharas, Aldaz-Carroll, and Rahardja 2007.

Note: The figure charts return volatility before and after the 1997–98 crisis.

Other authors who promote the precautionary motive note that the differences in the reserve accumulation levels in emerging markets are closely related to the degree of capital market liberalization and global integration. Empirically, the higher the level of capital account liberalization (relative to 1980), the higher 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 in trade and FDI may be well founded,

■ FIGURE 4.5 Foreign Exchange Reserves Have Grown Since the 1997–98 Crisis



Sources: International Financial Statistics Database, International Monetary Fund, <http://ifs.apdi.net/imf/>; Economic and Financial Databases, Haver Analytics, <http://www.haver.com/>.

smoothing behavior by central banks should have no net impact on reserves over time.¹⁵ In practice, there does not appear to have been any change in the volatility of Asian exchange rates against the U.S. dollar before or since the crisis, although the crisis period itself was characterized by high volatility. Interestingly, there is also little difference between the extent of the volatility of Asian currencies and that of Latin American currencies after 2003, with the exception of Brazil and the República Bolivariana de Venezuela, which show abnormally high volatilities.

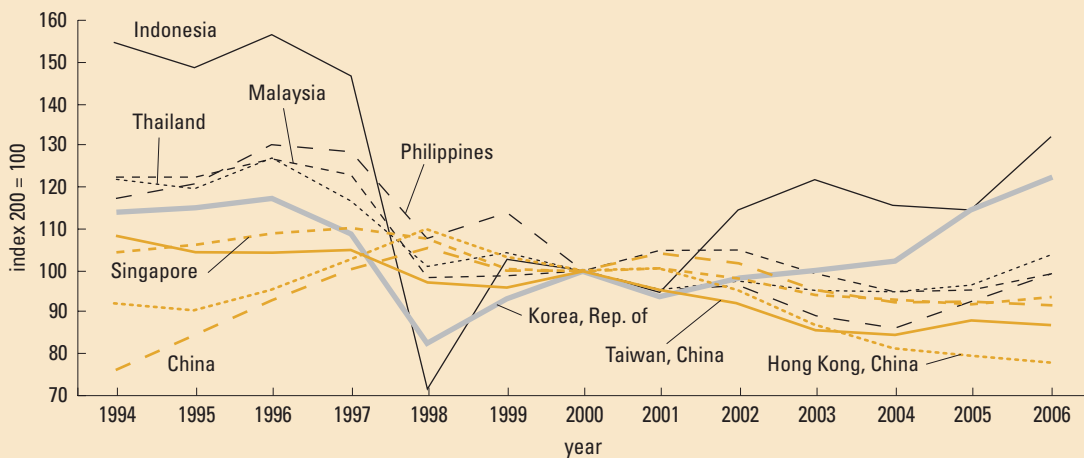
An alternative explanation for Asia's accumulation of reserves is that it stems from a desire to maintain relatively stable and competitive exchange rates so as to export aggressively as a solution to the crisis and deep recession of 1997–98.¹⁶ This argument, however, may only explain part of the story. If it were true, one would expect the accumulation of reserves 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 1997–98 crisis. In addition, the argument suggests 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 United States.¹⁷ And real effective rates in the region, including the rates in China, have been variable (see figure 4.6).

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

Since 2002, while the current account surplus still represents much of the increase in reserves, the private capital account surplus in East Asia has taken up a growing share of the region's accumulation in reserves, especially for China (see table 4.4).¹⁸

■ FIGURE 4.6 Effective Exchange Rates Have Fluctuated Considerably Since 1994



Sources: Information Notice System Database, International Monetary Fund; International Financial Statistics Database, International Monetary Fund, <http://ifs.apdi.net/imf/>.

■ TABLE 4.4 **Current and Capital Account Surpluses, 2002–05**

US\$ billions

Economy	Current account balance				Net capital inflows ^a			
	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
Southeast 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, China	12.4	16.5	15.7	20.3	-11.7	-10.0	-10.5	-19.6
Korea, Rep. of	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

Sources: International Financial Statistics Database, International Monetary Fund, <http://ifs.apdi.net/imf/>; Economic and Financial Databases, Haver Analytics, <http://www.haver.com/>.

a. Sum of all capital account flows, plus errors and omissions; derived as change in reserves, less the current account.

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

A third explanation focuses on the risk properties of foreign exchange reserves, which are held largely in liquid, safe investments, and the risk properties of foreign portfolio capital, which is risk bearing. As noted by McCauley (2003: 46), “East Asian economies are grossing up their balance sheets systematically to transfer risk to the rest of the world and to build up liquidity.” 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.¹⁹ But this view has been widely criticized largely because of the

mismatch between the location of reserves (in U.S. Treasury bonds) and the sources of FDI (mainly regional).²⁰

Significant costs accrue to regional economies because of the accumulation of such large reserves. These costs include the opportunity costs of capital, the quasi-fiscal costs of monetary sterilization, and the possible capital losses from exchange rate fluctuations. But there are also benefits from transferring risk to the rest of the world. As noted above, large reserves may substantially reduce the risk of capital reversals, and, if a reversal were to occur, large reserves would offer some protection by reducing the impact. One implication of this explanation is that, once the desired level of risk sharing has been achieved, then reserves will even out or grow in line with trade or other risk factors.

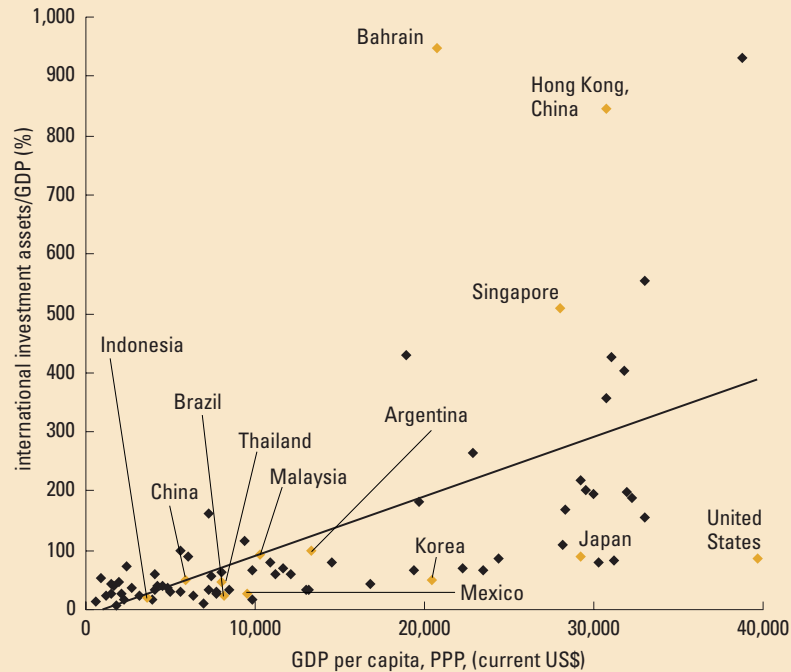
In an environment in which capital account liberalization is only beginning, it is difficult to comment on whether foreign exchange reserves are excessive or not. If the ratio of all foreign assets (public and private) to GDP is compared across countries, developing East Asia does not appear to have any excess despite its relatively large public foreign exchange reserves. The inference is that East Asia's private sector is holding much less in foreign exchange than one might expect for countries at similar incomes. This is perhaps because of regulations that have restricted the set of institutional investors in the region, such as insurance companies and pension funds. This implies that the issue in the region may have more to do with the balance of foreign asset holdings between the public and private sectors than with the size of the 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 from a different risk-return perspective (see figure 4.7).

Regional Financial Cooperation

Foreign exchange reserves provide a mechanism for reducing the risk of a sudden capital flow reversal, but may be an expensive way to achieve 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+3.²¹ Through this agreement, the central banks of the 13 ASEAN+3 countries have agreed to make lines of credit available to each other in the event of a crisis. Some 17 agreements have already been

■ FIGURE 4.7 East Asian Holdings of Foreign Assets Are Not Unusually High, 2004



Sources: Coordinated Portfolio Investment Survey Database, International Monetary Fund, <http://www.imf.org/external/np/sta/pi/cpis.htm>; World Development Indicators Database, World Bank, <http://www.worldbank.org/data/datapubs/datapubs.html>.

signed, valued at over US\$40 billion. But the Chiang Mai Initiative is broader than simply a line of credit. It now also provides for timely data provision and regional surveillance through regular exchanges, the monitoring of capital flows, and the training of key personnel. It represents the 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 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 more stable relative to bank financing. The diversification of funding sources to include international bond markets also adds to the stability of flows. Through the Executives' Meetings of East Asia-Pacific Central Banks, concrete measures have been taken to address weak-

nesses in Asian bond markets from the investor perspective, as well as weaknesses in the process of issuance.

The first Asian Bond Fund involved voluntary contributions by the 11 member governments of the Executives' Meetings of East Asia–Pacific Central Banks. Each government provided about 1 percent of its reserves to a fund dedicated to purchasing U.S. dollar sovereign and semi-sovereign bonds of eight of the member economies. (Australia, Japan, and New Zealand do not supply bonds for the fund.) The initial size of the fund was about US\$1 billion, and the fund has been passively managed by the investment management unit of the Swiss-based Bank for International Settlements.

In a noteworthy next step, a second Asian Bond Fund was established in December 2004. The resources were doubled (US\$2 billion), and the mandate of the new fund is to invest in selected domestic-currency sovereign and quasi-sovereign bonds of the eight economies.

The second fund comprises two components valued at US\$1 billion each: the Pan-Asian Bond Index Fund and the Fund of Bond Funds. The first is a single bond fund, while the second is a two-layered structure consisting of a parent fund that invests in eight single-market subfunds.²² The funds are passively managed to match the benchmark indexes. The seed money for single bond funds has been divided according to predetermined criteria, and local fund managers have been appointed to oversee the respective funds. The specific criteria for market weights in each subfund (and the distribution within the Pan-Asian Bond Index Fund) are based on (1) the size of the local market, (2) the turnover ratio in that market, (3) the sovereign credit rating, and (4) a market openness factor. The market weights are reviewed annually, and market openness is a particularly important factor in the allocation of weights. The parent fund is limited to investments by central banks that are members of the Executives' Meetings of East Asia–Pacific Central Banks. While the initial phase of the Pan-Asian Bond Index Fund was confined to investments only by member central banks (US\$1 billion), it has been opened up to investments by other retail investors during the second phase.

The Asian Bond Fund should help the region diversify from bank lending to bond financing by reducing constraints and introducing low-cost products on the supply side and by raising investor awareness and broadening the investor base on the demand side.²³

Beyond the potential for recycling regional funds intraregionally and obtaining a superior risk-return trade-off, the Asian Bond Fund 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, regional integration measures like the Asian Bond Fund that enhance the investor base should help moderate this problem.²⁴

The combination of regional cooperation, self-insurance through the accumulation of foreign exchange reserves, 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 may provide an impetus to diversification, most of the needed policy measures will have to be implemented in domestic financial systems. The next section discusses recent developments in these systems.

Toward 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 surpassed US\$10 trillion equivalent (see table 4.5). In most international comparisons, the financial depth in East Asian financial markets is above the average relative to other

■ TABLE 4.5 Financial Markets, Especially Securities Markets, Have Surged Since 1997

Economy	Bank assets				Equity market capitalization				Bonds outstanding			
	US\$ billions		% of GDP		US\$ billions		% of GDP		US\$ billions		% of GDP	
	1997	2005	1997	2005	1997	2005	1997	2005	1997	2005	1997	2005
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, Rep. of	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, China	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: International Financial Statistics Database, International Monetary Fund, <http://ifs.apdi.net/imf/>; World Federation of Exchanges (<http://www.world-exchanges.org/WFE/home.Asp>); Bank for International Settlements (<http://www.bis.org/>); Asian Bond Indicators Database, Asian Development Bank, <http://asianbondsonline.adb.org/asiabondindicators/>; World Development Indicators Database, World Bank, <http://www.worldbank.org/data/datapubs/datapubs.html>; World Bank staff calculations.

countries at similar income levels. This applies to banking, equity, and even bond markets.²⁵

Significant financial market reforms have already been undertaken. Banks have been restructured and recapitalized and are now much sounder. Prudential regulations and supervision have been strengthened, although areas remain that need strengthening, including on-site examination. Businesses are also showing healthier balance sheets; they have 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 in the development of corporate bond markets. Banks are healthy precisely because they have reduced their lending to corporates lacking 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 just through lower volumes, and this would help bring to the market a more diversified set of investors, including institutional investors that have yet to play a major role in capital market deepening in the region.

Banking

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

Because of 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 and 2 percent for most countries in the region. Hong Kong (China) banks show the lowest operating costs. Indonesia and the Philippines are exceptions; there, bank operating costs correspond to close to 3 percent of assets. The figures for the region are comparable to those on banks in Europe and Japan and are significantly

lower than those on banks in the United States, where the average is around 3 percent of assets.

Low operating costs have permitted banks to improve their financial stability and soundness. The average share of nonperforming loans has fallen to around 11 percent, although the share continues to display considerable variation across the region. Both Indonesia and Thailand, which had peak nonperforming loan ratios of 48 and 45 percent, respectively, in 1998, had brought the ratios down to single digits by the end of 2005 (7.6 percent and 8.3 percent, respectively). In Korea, the ratio has fallen to only 1.2 percent. At the same time, all banks (except those in China) have rebuilt their capital base, and capital adequacy ratios in the region stand at around 14 percent, which is comparable to the ratios of banks in emerging Europe and in Latin America (see figures 4.8 and 4.9).

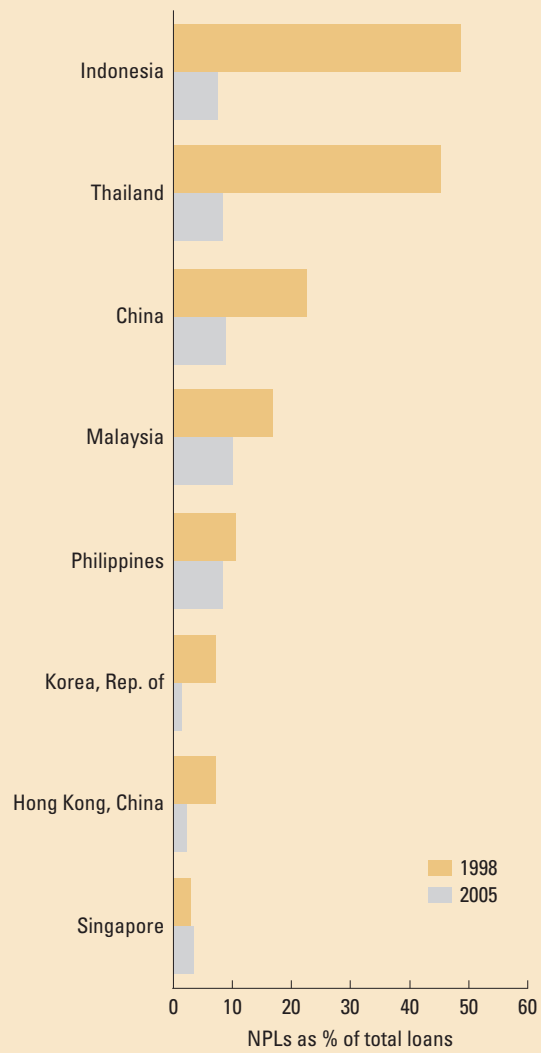
On the other side of the ledger, the corporate customers of banks are also showing much healthier balance sheets than they did before the crisis. The most extreme example is Korea. Before the crisis, the average corporate borrower in Korea had a debt-equity ratio of 181, three times higher than an average borrower in the United States. Indonesia and Thailand were other countries in which leverage was high (71 and 94 percent, respectively). By 2004, these leverage ratios had declined to 49 percent (Korea) and 47 percent (Thailand), though the ratio remained high in Indonesia (68 percent).

Obviously, firms with very high debt levels tend to be risky customers. But here, too, the trend is toward better balance sheets. The proportion of firms with debt-equity ratios greater than 200 percent has been halved in Indonesia, Korea, and Thailand 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. Banks have been improving their balance sheets 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.

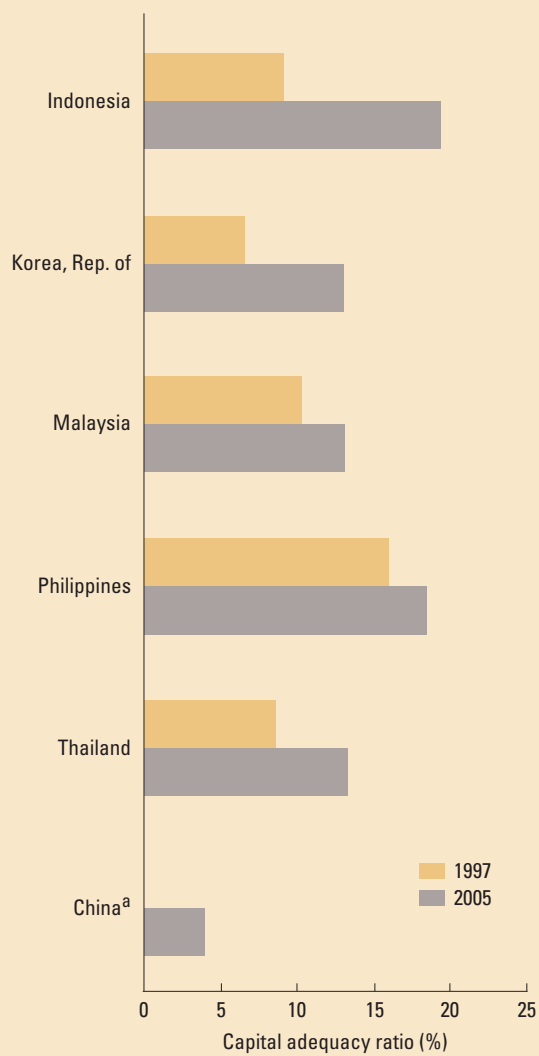
Clearly, the nature of the banking system is changing in East Asia. The provision of credit to the corporate sector is no longer the principal activity of banks. Banks have diversified by lending to households. They have also engaged in a number of investment activities through which they earn fees and trading income. While this makes for sounder banks, it suggests that the era of easy credit

■ FIGURE 4.8 The Share of Nonperforming Loans Has Shrunk Since 1997



Source: World Bank staff calculations based on data gathered from local resources.

■ FIGURE 4.9 Capital Adequacy Has Strengthened Since 1997



Source: World Bank staff calculations based on data gathered from local resources.

a. The latter year for China is 2004.

to the firms making up the production networks has passed. Firms must meet a more stringent test of financial market discipline.

Securities Markets

Securities markets—equities and bonds—have grown appreciably in the region since 1997. Stock market capitalization had almost tripled, to US\$2.3 trillion, by 2004. Bond markets have added 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 the amount of capital that has been 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\$660 million in Latin America.

These aggregates disguise the varying performance of securities markets across the region. At one end, Hong Kong (China) and Singapore have well-developed markets. In the middle, Korea and Malaysia have also deepened their markets and now have relatively large bond markets as well. In its bond markets, Thailand has experienced one of the most rapid growth rates in the region, but much of this growth reflects the issuance of government and financial institution bonds to meet the costs associated with recapitalizing banks following the crisis. China, Indonesia, and the Philippines have significantly weaker systems that do not provide adequate finance to the corporate sectors.²⁶

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

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

Measures of the efficiency of equity markets in the region against the situation in other countries show that Hong Kong (China), Korea, Malaysia, and Singapore

fare reasonably well in global terms, while China, Indonesia, the Philippines, and Thailand do poorly.

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 prices 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 may buy or sell at a specified market price. And it ensures that the market will return to normalcy if it becomes disrupted by an imbalance in orders or other shocks. Without liquidity, the market is unable to 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 performance in securities markets because of the deficiencies in information for pricing accurately, the high transaction costs, including underdeveloped market infrastructure in some places, and the lack of a diversified investor base, especially among the insurance companies, pension funds, and mutual funds that manage large amounts of the long-term capital that is best suited for securities markets.

Conclusions

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

Financial Structure and Firm Performance

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

Innovative activity requires a high degree of trust on the part of financial investors. Innovations take time to implement, and returns accrue far in the future.

They are risky and imply venturing into uncharted waters. Many innovations fail, but the ones that succeed show high returns. Firms that are successful innovators must understand when it is appropriate to admit to failure and cease spending money on a project and when to keep going. Managers cannot be trusted to make these decisions because the incentives they face are different from those of shareholders. Shareholders bear the costs of failure, while managers reap many of the benefits of success.

Bank credits typically involve significant monitoring by banks of the managers of their client borrowers. This type of relationship lending is founded on the theory that banks know the business in which their customers are operating and, because of this expertise, are able to make sound judgments about the business prospects of their clients. The willingness of banks to extend credit is tied to this steady updating of their views on the health of the borrower firms.

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

But, when innovations are more significant, banks may become 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 more credit to firms. In these circumstances, arm's-length financing in capital markets is preferred.

Capital markets bring together a range of investors who may express substantial differences in their opinions on the likely success or failure of an innovation. This increases the likelihood that a firm will find a group of investors who believe in the 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 value of its innovation.

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

These arguments are confirmed 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.²⁷ Changes in the financing structure of firms appear to be related to large changes in the value of the firms 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. Because constant innovation is critical for members of a production network, a broad, diversified financial system is desirable.

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 now than it once was to sudden shifts in investor sentiment because the structure of financing has shifted toward FDI, the maturities of liabilities have lengthened, and financing sources have become more diversified to include important regional economies.

As noted in IMF (2006), regional economies are now more resilient to a sudden reversal of inflows than they were 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 have been intermediated this time through banks, leaving banking 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 may be brought by changes in sentiment and international financial conditions.²⁸

But these successes have had costs. Countries in the region have moved rapidly to build up their defenses against major foreign exchange movements and conquer the “fear of floating.” In some instances, they may even have moved too far. Rodrik (2006) has concluded that “developing countries have responded to financial globalization in a highly unbalanced and far from optimal manner. They have overinvested in the costly strategy of reserve accumulation and underinvested in capital account management policies” (p. 12). The region is trying to address this imbalance through enhanced regional cooperation. It does appear, however, that the foreign exchange risks that might undermine regional production networks have been lessened.

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 may be especially detrimental to innovation. The priority for the region is to develop equity and bond markets to permit more effective risk sharing at home and abroad.

Notes

1. See Sheng (2006) on the Asian network economy.
 2. East Asia refers to the member countries of the Association of Southeast Asian Nations (Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam), plus China, Hong Kong (China), Japan, the Republic of Korea, Mongolia, and Taiwan (China). Emerging East Asia refers to East Asia, minus Japan. Developing East Asia refers to emerging East Asia, minus Hong Kong (China), Korea, and Singapore.
 3. The sudden stop was first suggested in Dornbusch, Goldfajn, and Valdés (1995). See also Calvo (1998).
 4. See Carlson and Hernandez (2002), Dasgupta and Ratha (2000), and Montiel and Reinhart (1999).
 5. See Gopinath and Echeverria (2004) and Blonigen (2005).
 6. See Hallward-Driemeier, Iarossi, and Sokoloff (2002).
 7. See Rajan and Zingales (2004).
 8. See IMF (2003).
 9. For instance, see Ito and Park (2004) and Eichengreen and Luengnaruemitchai (2004).
 10. Malaysia shows up as an exception perhaps because it has exercised capital controls during much of the postcrisis period.
 11. See Aizenman and Siregar (2006) for more detailed descriptive data on reserve stockpiling in East Asia.
 12. Outside East Asia, India has also shown a sharp increase in reserves, from US\$1 billion in 1990–91 to US\$150 billion by early 2006.
 13. See Aizenman and Marion (2003) and Bird and Rajan (2003). There is a growing body of literature exploring various aspects of the precautionary motive for reserve hoarding. See Aizenman and Lee (2005), García and Soto (2004), Jeanne and Rancière (2006), Kim et al. (2004), and Li and Rajan (2005).
 14. See Bird and Rajan (2002) and Rajan (2003).
 15. See Calvo and Reinhart (2002), Rajan (2002), and the references cited therein.
 16. In addition, part of the change in reserves in U.S. dollar terms arises from revaluation gains caused by the depreciation of the U.S. dollar against the major currencies in which reserves might be held, especially the euro.
- While Aizenman and Lee (2005) argue against the mercantilist rationale for the accumulation of reserves in East Asia, Ghosh (2005) has observed that:
- Intervention was initially motivated by a desire to build up a buffer stock after the Asian crisis had depleted levels of reserves . . . However, rapid 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 that:
- Monetary 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)
17. See Goldstein and Lardy (2005).

18. A substantial portion of the balance of payments surplus is, of course, driven by China. See Ouyang, Rajan, and Willett (2006) and Prasad and Wei (2005) for details on the dynamics of the capital and current account balances in China.

19. See Dooley, Folkerts-Landau, and Garber (2004).

20. See Kamin (2005); Prasad and Wei (2005); Eichengreen (2005).

21. See Rajan (2006) and Rana (2002).

22. The International Index Company, which is owned by ABN Amro, JP Morgan, Morgan Stanley, and other international banks and global financial firms, has created the benchmark indexes for all nine funds.

23. Hamada, Jeon, and Ryou (2004), Leung (2005), and Ma and Remolona (2005) elaborate on this.

24. See Mehl and Reynaud (2005).

25. This section draws on Ghosh (2006).

26. See Gyntelberg, Ma, and Remolana (2006).

27. See Atanassov, Nanda, and Seru (2005).

28. In addition, while there has been 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.

References

- Aizenman, Joshua, and Jaewoo Lee. 2005. "International Reserves: Precautionary Versus Mercantilist Views, Theory and Evidence." NBER Working Paper 11366, National Bureau of Economic Research, Cambridge, MA.
- Aizenman, Joshua, and Nancy Marion. 2003. "The High Demand for International Reserves in the Far East: What Is Going On?" *Journal of the Japanese and International Economies* 17 (3): 370–400.
- Aizenman, Joshua, and Ilan Noy. 2005. "FDI and Trade: Two Way Linkages?" NBER Working Paper 11403, National Bureau of Economic Research, Cambridge, MA.
- Aizenman, Joshua, and Reza Siregar. 2006. "Finance and Economic Integration in East Asia." Background paper, World Bank, Washington, DC.
- Atanassov, Julian, Vikram K. Nanda, and Amit Seru. 2005. "Finance and Innovation: The Case of Publicly Traded Firms." Ross School of Business Paper 970 (October), Stephen M. Ross School of Business, University of Michigan, Ann Arbor, MI.
- Aviat, Antonin, and Nicolas Coeurdacier. 2005. "The Geography of Trade in Goods and Asset Holdings." DELTA Working Paper 2004-10, Department and Laboratory of Applied and Theoretical Economics, Ecole Normale Supérieure, Paris.
- Beale, Lieven, Annalisa Ferrando, Peter Hördahl, Elizaveta Krylova, and Cyril Monnet. 2004. "Measuring Financial Integration in the Euro Area." Occasional Paper 14, European Central Bank, Frankfurt am Main.
- Bird, Graham, and Ramkishan S. Rajan. 2002. "The Evolving Asian Financial Architecture." Princeton Essays in International Economics 226 (February), Princeton University, Princeton, NJ.
- _____. 2003. "Too Much of a Good Thing?: The Adequacy of International Reserves in the Aftermath of Crises." *World Economy* 26 (6): 873–91.
- Blonigen, Bruce A. 2005. "A Review of the Empirical Literature on FDI Determinants." NBER Working Paper 11299, National Bureau of Economic Research, Cambridge, MA.
- Calvo, Guillermo A. 1998. "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stops." *Journal of Applied Economics* 1 (1): 35–54.
- Calvo, Guillermo A., and Carmen M. Reinhart. 2002. "Fear of Floating." *Quarterly Journal of Economics* 117 (2): 379–408.

- Carlson, Mark, and Leonardo Hernandez. 2002. "Determinants and Repercussions of the Composition of Capital Inflows." International Finance Discussion Paper 717, Board of Governors of the Federal Reserve System, Washington, DC.
- Dasgupta, Dipak, and Dilip Ratha. 2000. "What Factors Appear to Drive Capital Flows to Developing Countries? And How Does Official Lending Respond?" Policy Research Working Paper 2392, World Bank, Washington, DC.
- Dooley, Michael P., David Folkerts-Landau, and Peter M. Garber. 2004. "The U.S. Current Account Deficit and Economic Development: Collateral for a Total Return Swap." NBER Working Paper 10727, National Bureau of Economic Research, Cambridge, MA.
- Dornbusch, Rudiger, Ilan Goldfajn, and Rodrigo O. Valdés. 1995. "Currency Crises and Collapses." *Brookings Papers on Economic Activity* 2: 219–93.
- Eichengreen, Barry. 2005. "The Blind Men and the Elephant." Paper presented at the Tokyo Club Foundation's "Macroeconomic Research Conference on the Future of International Capital Flows," Kyoto, November 21–22.
- Eichengreen, Barry, and Pipat Luengnaruemitchai. 2004. "Why Doesn't Asia Have Bigger Bond Markets?" NBER Working Paper 10576, National Bureau of Economic Research, Cambridge, MA.
- Frankel, Jeffrey A. 1999. "No Single Currency Regime Is Right for All Countries or at All Times." NBER Working Paper 7338, National Bureau of Economic Research, Cambridge, MA.
- García, Pablo, and Claudio Soto. 2004. "Large Hoardings of International Reserves: Are They Worth It?" Central Bank of Chile Working Paper 299, Central Bank of Chile, Santiago, Chile.
- Ghosh, Swati R. 2005. "East Asian Finance: The Road to Robust Markets." Draft report, World Bank, Washington, DC.
- _____. 2006. *East Asian Finance: The Road to Robust Markets*. Washington, DC: World Bank.
- Goldstein, Morris, and Nicholas Lardy. 2005. "China's Role in the Revived Bretton Woods System: A Case of Mistaken Identity." IIE Working Paper 05–2, Institute for International Economics, Washington, DC.
- Gopinath, Munisamy, and Rodrigo Echeverria. 2004. "Does Economic Development Impact the Foreign Direct Investment–Trade Relationship?: A Gravity Model Approach." *American Journal of Agricultural Economics* 86 (3): 778–83.
- Gruber, Joseph W., and Steven B. Kamin. 2005. "Explaining the Global Pattern of Current Account Imbalances." International Finance Discussion Paper 846, Board of Governors of the Federal Reserve System, Washington, DC.
- Gyntelberg, Jacob, Guonan Ma, and Eli M. Remolana. 2006. "Developing Corporate Bond Markets in Asia." BIS Paper 26 (February): 13–21, Bank for International Settlements, Basel.
- Hallward-Driemeier, Mary, Giuseppe Iarossi, and Kenneth L. Sokoloff. 2002. "Exports and Manufacturing Productivity in East Asia: A Comparative Analysis with Firm-Level Data." NBER Working Paper 8894, National Bureau of Economic Research, Cambridge, MA.
- Hamada, Koichi, Seung-Cheol Jeon, and Jai-Won Ryou. 2004. "Asian Bonds Market: Issues, Prospects, and Tasks for Cooperation." Paper presented at the Association of Korean Economic Studies, University of Washington Research Center for International Economics, and Korea Development Institute Conference, "Korea and the World Economy III," Sungkyunkwan University, Seoul, July 3–4.
- IMF (International Monetary Fund). 2003. "Trade Finance in Financial Crises: Assessment of Key Issues." Policy Development and Review Department, International Monetary Fund, Washington, DC. <http://www.imf.org/external/np/pdr/cr/2003/eng/120903.pdf>.
- _____. 2004. *Global Financial Stability Report: Market Developments and Issues*, September. Washington, DC: International Monetary Fund.
- _____. 2006. "Regional Economic Outlook: Asia and Pacific." World Economic and Financial Surveys, May, International Monetary Fund, Washington, DC.
- Ito, Takatoshi, and Yung-Chul Park, eds. 2004. *Developing Asian Bondmarkets: Challenges and Strategies*. Canberra: Asia Pacific Press.

- Jeanne, Olivier, and Romain Rancière. 2006. "The Optimal Level of International Reserves for Emerging Market Countries: Formulas and Applications." IMF Working Paper 229, International Monetary Fund, Washington, DC.
- Kamin, Steven B. 2005. "The Revived Bretton Woods System: Does It Explain Developments in Non-China Developing Asia?" Paper presented at the Federal Reserve Bank of San Francisco Symposium on "The Revived Bretton Woods System: A New Paradigm for Asian Development?" February 4.
- Kharas, Homi, Enrique Aldaz-Carroll, and Sjamsu Rahardja. 2007. "East Asia: Regional Integration among Open Economies." In *Economic Integration in Asia and India*, ed. Masahisa Fujita. Basingstoke, United Kingdom: Palgrave Macmillan.
- Kim, Jung Sik, Jie Li, Ramkishan S. Rajan, Ozan Sula, and Thomas D. Willett. 2004. "Reserve Adequacy in Asia Revisited: New Benchmarks Based on the Size and Composition of Capital Flows." Paper presented at Claremont Graduate University, Claremont McKenna College, and Korea Institute of International Economic Policy "Conference on Monetary and Exchange Rate Arrangements in East Asia," Seoul, August 26–27.
- Leung, Julia. 2005. "Developing Bond Markets in Asia: Experience with ABF2." Paper presented at the Bank for International Settlements, People's Bank of China Seminar, "Developing Corporate Bond Markets in Asia," Kunming, China, November 17–18.
- Li, Jie, and Ramkishan S. Rajan. 2005. "Can High Reserves Offset Weak Fundamentals?: A Simple Model of Precautionary Demand for Reserves." CIES Discussion Paper 0509, Center for International Economic Studies, University of Adelaide, Adelaide, Australia.
- Ma, Guonan, and Eli M. Remolona. 2005. "Opening Markets through a Regional Bond Fund: Lessons from ABF2." *BIS Quarterly Review* June: 81–92.
- McCauley, Robert N. 2003. "Capital Flows in East Asia since the 1997 Crisis." *BIS Quarterly Review* June: 41–55.
- Mehl, Arnaud, and Julien Reynaud. 2005. "The Determinants of 'Domestic' Original Sin in Emerging Market Economies." Working Paper 560, European Central Bank, Frankfurt am Main.
- METI (Japan, Ministry of Economy, Trade, and Industry). 2005. *White Paper on International Economy and Trade 2005: Towards a New Dimension of Economic Prosperity in Japan and East Asia*. Tokyo: Ministry of Economy, Trade, and Industry.
- Mody, Ashoka, and Shoko Negishi. 2001. "The Role of Cross-Border Mergers and Acquisitions in Asian Restructuring." In *Resolution of Financial Distress: An International Perspective on the Design of Bankruptcy Laws*, ed. Stijn Claessens, Simeon Djankov, and Ashoka Mody, 305–39. Washington, DC: World Bank.
- Montiel, Peter J., and Carmen M. Reinhart. 1999. "Do Capital Controls and Macroeconomic Policies Influence the Volume and Composition of Capital Flows?: Evidence from the 1990s." *Journal of Money and International Finance* 18 (4): 619–35.
- Obstfeld, Maurice. 1986. "Rational and Self-Fulfilling Balance-of-Payments Crises." *American Economic Review* 76 (1): 72–81.
- _____. 1994. "The Logic of Currency Crises." *Cahiers économiques et monétaires* 43: 189–213, Banque de France, Paris.
- Ouyang, Alice Y., and Ramkishan S. Rajan. 2005. "Monetary Sterilization in China since the 1990s: How Much and How Effective?" CIES Discussion Paper 0507, Center for International Economic Studies, University of Adelaide, Adelaide, Australia.
- Ouyang, Alice Y., Ramkishan S. Rajan, and Thomas D. Willett. 2006. "Monetary Sterilization in Asia." Draft working paper, School of Public Policy, George Mason University, Arlington, VA.
- Portes, Richard, and Helene Rey. 1999. "The Determinants of Cross-Border Equity Flows." NBER Working Paper 7336, National Bureau of Economic Research, Cambridge, MA.
- Prasad, Eswar, and Shang-Jin Wei. 2005. "The Chinese Approach to Capital Inflows: Patterns and Possible Explanations." NBER Working Paper 11306, National Bureau of Economic Research, Cambridge, MA.
- Rajan, Ramkishan S. 2002. "Exchange Rate Policy Options for Southeast Asia: Is There a Case for Currency Baskets?" *World Economy* 25 (1): 137–63.

- _____. 2003. "Safeguarding against Capital Account Crises: Unilateral, Regional, and Multilateral Options for East Asia." In *Financial Governance in East Asia: Policy Dialogue, Surveillance and Cooperation*, ed. Gordon de Brouwer and Yunjong Wang, 239–63. London: Routledge.
- _____. 2006. "Monetary and Financial Cooperation in Asia: Taking Stock of Recent On-Goings." RIS Discussion Paper 107, Research and Information System for Developing Countries, New Delhi.
- Rajan, Raghuram G., and Luigi Zingales. 2004. *Saving Capitalism from the Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity*. Princeton, NJ: Princeton University Press.
- Rana, Pradumna B. 2002. "Monetary and Financial Cooperation in East Asia: The Chiang Mai Initiative and Beyond." ERD Working Paper 6 (February), Economics and Research Department, Asian Development Bank, Manila.
- Rodrik, Dani. 2006. "The Social Cost of Foreign Exchange Reserves." *International Economic Journal* 20 (3): 253–66.
- Sheng, Andrew. 2006. "The Asian Network Economy in the 21st Century." In *East Asian Visions: Perspectives on Economic Development*, ed. Indermit S. Gill, Yukon Huang, and Homi Kharas, chap. 15. Washington, DC: World Bank.
- UNCTAD (United Nations Conference on Trade and Development). 2005. *World Investment Report 2005: Transnational Corporations and the Internationalization of R&D*. Geneva: United Nations.