

EXPERIENCES WITH CURRENT ACCOUNT DEFICITS IN SOUTHEAST ASIA

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In the 1990s, Southeast Asia experienced very rapid growth associated with large and persistent current account deficits.¹ The episode lasted from 1990 to around 1996, ending with the outbreak of the Asian crisis in 1997–98. Current account deficits peaked at around 10 percent of gross domestic product (GDP) in Malaysia in 1995 and at 8 percent of GDP in Thailand in 1996 (compared with 7 percent in Mexico around the time of the peso crisis in 1994). Deficits were also large in the Philippines and Indonesia, at around 4 percent of GDP. During the crisis years of 1997–98, deficits became surpluses that persisted for years (in the Philippines this occurred much later). Malaysia's surpluses rose to around 15 percent of GDP after its crisis, whereas they declined in Thailand (turning to a small deficit for a time) and Indonesia. The current account reversals to surpluses were associated with a sudden stop in capital inflows, which significantly exceeded current account deficits in the first half of the 1990s, but which had not recovered their previous levels by 2006. The reversal was largest in Thailand, where net capital flows switched from an annual average inflow of \$21 billion in 1995–96

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1. I draw on the experiences of the four countries in Southeast Asia where current account sustainability was an issue in the first half of the 1990s, namely, Indonesia, Malaysia, the Philippines, and Thailand. For reference, I include data on Singapore, which consistently maintained large surpluses during this period.

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to an outflow of \$13 billion in 1997–98 (a reversal of \$34 billion). Indonesia saw its capital flows swing from an \$11 billion inflow to a \$5 billion outflow. The reversals were smaller in Malaysia and the Philippines (from \$9 billion to 0 and from \$8 billion to \$3 billion, respectively). By way of comparison, Singapore also experienced an increase in capital outflows of \$11 billion over the period, but it had a current account surplus of around 15 percent of GDP.

The sudden stop episode was associated with sharp contractions in output that were unprecedented in Asia over the sample period. The 1998 absolute drop in output was largest in Indonesia and Thailand, although the swing in output in Malaysia was second only to Indonesia. In the Philippines, the drop in output was comparatively modest. Singapore experienced a more severe drop in output, in part reflecting the country's economic links to neighbors with sharply declining outputs, such as Indonesia. These declines in output were followed by relatively quick recoveries but permanently lower growth.

This paper argues that the drive for economic growth contributed to current account deficits and influenced policy responses. It is organized as follows. The first section describes current account developments in Southeast Asian economies from the saving-investment and trade perspectives. The second section focuses on the experience with current account deficits in the period leading up to the sudden current account reversals of 1997–98. I review arguments made at the time (some of which are still made today) suggesting that current account deficits were sustainable. The third section discusses fiscal and monetary policy responses with open capital accounts. I also address the use of capital controls prior to the crisis and the impact they may have had on current account balances or sustainability. The final section offers some concluding observations on current account experiences in Southeast Asia.

1. CURRENT ACCOUNTS IN SOUTHEAST ASIA: STYLIZED FACTS

To provide some perspective on current accounts in Southeast Asia, table 1 reports the balance of payments for the five countries in the sample, while figure 1 illustrates the evolution of national saving and investment and the current account in five Southeast Asian economies. The first point to emerge from the figure is that until the Asian crisis, saving ratios were high in Malaysia (peaking at nearly 40 percent of GDP in 1998), Thailand (averaging around

35 percent of GDP in 1991–94), and—for a time—Indonesia (with a maximum of 38 percent in 1997), whereas the Philippines posted somewhat lower rates (with a peak of 25 percent in 1997). Saving rates fell significantly in all regions after the late 1990s. Thus the period of current account deficits was associated with higher saving rates than the more recent period of current account surpluses.

Figure 1. Current Account Balances as a Percentage of GDP

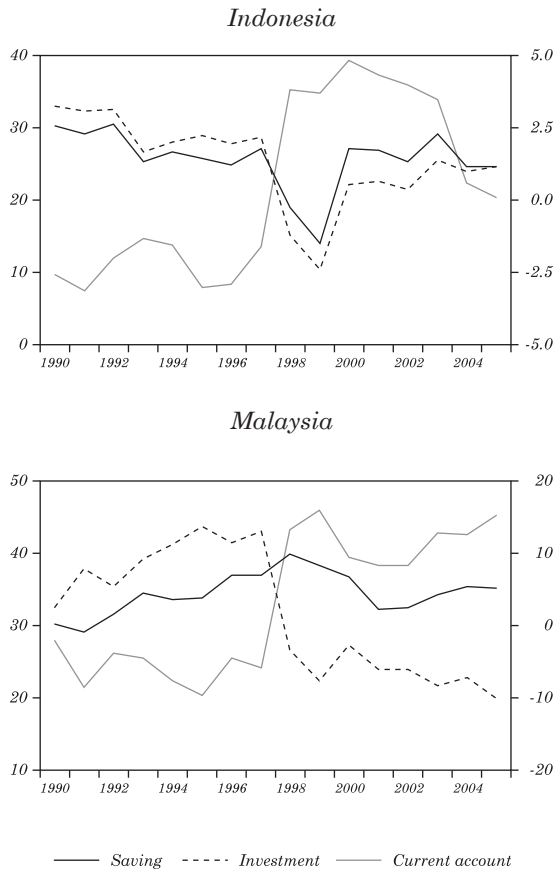
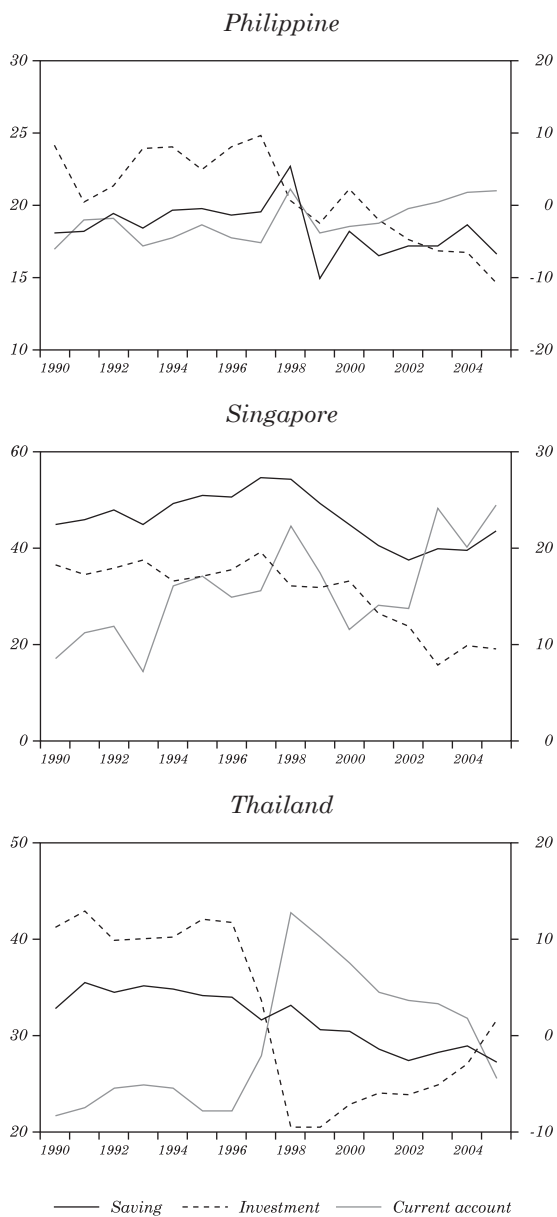


Figure 1. (continued)



Source: IMF.

Table 1. Balance of Payments in Asia^a
Billions of US dollars

Country	Current account balance				Net capital inflows ^b				Reserves				
									Increase				Stock
	1990-94	1995-96	1997-98	2000-05	1990-94	1995-96	1997-98	2000-05	1990-94	1995-96	1997-98	2000-05	Sep 2006
Indonesia	-3	-7	-0	6	5	11	-5	-3	1	3	-1	2	40
Malaysia	-3	-7	2	12	6	9	-0	-4	4	0	3	7	75
Philippines	-2	-3	-1	0	3	8	3	0	1	2	-0	-0	22
Singapore	6	14	17	22	-0	-4	-15	-14	6	8	6	6	129
Thailand	-7	-14	6	6	11	21	-13	-3	4	5	-4	3	60

Source: International Monetary Fund (IMF), *Balance-of-Payments Statistics*; IMF, *World Economic Outlook*.

a. Annual average for the period.

b. Financial account balance.

Second, fluctuations in the current account tend to mirror movements in investment rather than saving. The switch in current accounts from large deficits to large surpluses around 1998 largely reflects first surging investment and then its collapse below national saving in most countries in the sample. In particular, the emergence of current account surpluses in 1998 was associated with relatively stable saving ratios in Malaysia and Thailand and a fall in saving in Indonesia and the Philippines. On an annual basis, deviations in investment from trend are also more closely correlated with fluctuations in the current account than are deviations in saving (table 2). The drivers of investment spending in Southeast Asia, and its perceived sustainability and efficiency, are thus of particular interest for understanding fluctuations in the current account. To provide perspective, a comparison with Singapore reveals striking contrasts. Singapore maintained large and growing current account surpluses in this period, and saving rather than investment was more closely correlated with the current account. Indeed, investment spending was stable and national saving increased, although output growth reached double digits in the first half of the 1990s (see table A1 in the appendix).

Table 2. Correlation of Saving or Investment with Current Account Balance^a

Country	Correlation with saving		Correlation with investment	
	1985–2005	1985–2005 (excl. crisis ^b)	1985–2005	1985–2005 (excl. crisis ^b)
Indonesia	-0.08	0.10	-0.50	-0.36
Malaysia	0.48	0.48	-0.93	-0.93
Philippines	0.20	-0.04	-0.80	-0.86
Singapore	0.69	0.72	-0.34	-0.47
Thailand	-0.37	-0.58	-0.97	-0.97

Source: IMF; Bank for International Settlements (BIS) calculations.

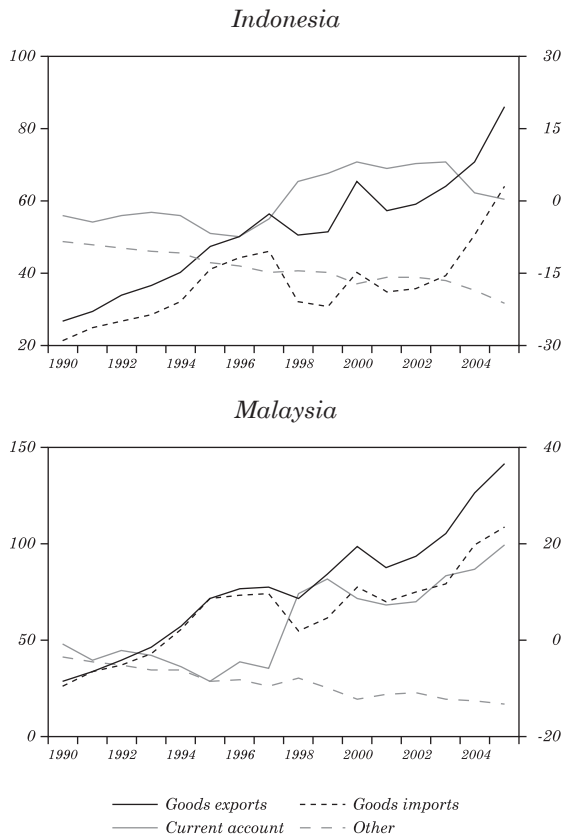
a. As applied to detrended annual series as a percentage of GDP. Trend series are estimated using the Hodrick-Prescott filter.

b. More specifically, excluding values from 1997–98.

Figure 2 illustrates trends from the perspective of merchandise imports and exports in U.S. dollars. In Indonesia and Malaysia, merchandise trade was in surplus or nearly balanced throughout the period; deficits were explained by other components of the current

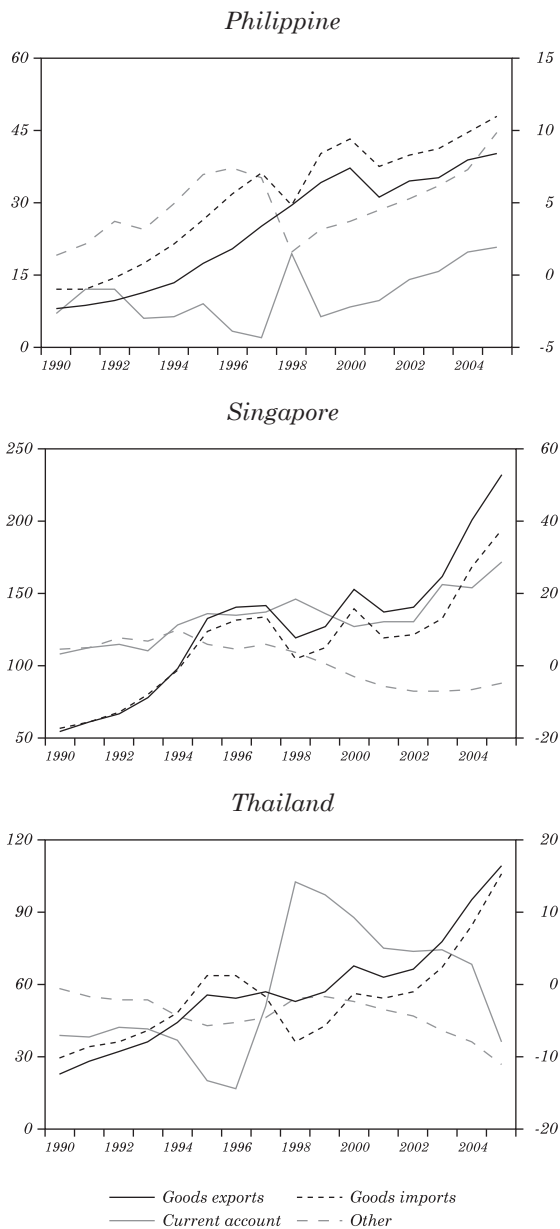
account. Merchandise export and import revenues both grew rapidly during the period of current account deficits in the first half of the 1990s, although import growth exceeded export growth over certain periods in the first half of the 1990s in Indonesia, Malaysia, the Philippines, and Thailand.² The large increase in trade surpluses after 1997 in a number of cases reflected a sharp drop in imports and a failure to keep pace with export growth thereafter. This is broadly in line with the view that imports were closely related to investment spending, which also declined sharply (see below).

Figure 2. Current Account Balances in Billions of U.S. Dollars^a



2. The trend in Singapore is not all that different, except that exports begin to visibly exceed imports starting in 1995.

Figure 2. (continued)



Source: IMF.

a. Other includes services, income, and transfers balance.

The conventional wisdom is that the Asian current account surpluses observed in recent years reflect rapid export growth, or what might be described as Bretton Woods II.³ Export growth has indeed remained a key driver of growth in Southeast Asia, and it contributed to recovery from the 1997–98 crisis.⁴ However, export revenues grew more rapidly and steadily during the period of current account deficits (and more stable exchange rates) than they did after 1996. The reversals of current account deficits to large surpluses around 1998 did not reflect strong or booming exports. On the contrary, in spite of steep currency depreciations, export revenues in U.S. dollars contracted in 1998 in all countries in the sample but the Philippines (where export revenue growth fell to 17 percent from 23 percent a year earlier). Imports fell by more, however, resulting in the current account reversals. Outside the crisis period, between 1990–95 and 1999–2005, average annual merchandise export revenue growth in U.S. dollars fell in Indonesia (from nearly 13 percent to 9 percent), Malaysia (20 percent to 10 percent), the Philippines (15 percent to 5 percent), and Thailand (19 percent to 11 percent).

Other components of the current account have also been relevant. The tourism industry is a significant contributor to current account surpluses in Thailand: the service account represented about a third of dollar inflows on exports, services income, and transfers in the 1990s and somewhat less than a quarter in the 2000s. In the Philippines, trade in goods and services comprised the bulk of the current account until 2001, when overseas workers remittances began to play a major role in turning the current account consistently to surplus (figure 2). In 2005 remittances totaled \$10.7 billion, corresponding to about half the sum of services income and transfers in the current account versus \$40 billion for merchandise exports). In Malaysia, trade surpluses have been offset by significant deficits on the nonmerchandise trade components of the current account.

1.2 The Importance of the Exchange Rate in the Current Account

The exchange rate's influence on the behavior of the current account is an important issue in small open economies like those in Southeast Asia. Calderón, Chong, and Loayza (2002) study the determinants of the current account using a panel data set of forty-four

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

4. See Guidotti, Sturzenegger, and Villar (2004).

developing countries, with annual data for 1966–94. They find that current account deficits are modestly persistent and rise with a real exchange rate appreciation, although this last effect is small. They also rise with an increase in domestic output growth and an increase in the terms of trade, but fall with faster growth of industrialized economies or higher interest rates.

Turning to Southeast Asia, some insights on the role of the exchange rate can be gained from a study on Thailand's current account by economists at the Bank of Thailand (Chayawadee and Jantarangs, 2004). The authors first estimate a single equation model of Thailand's current account with the lagged current account, the real effective exchange rate, trading partner output, domestic output, terms of trade, and a crisis dummy. They find that the impact of the real effective exchange rate is small: a 1 percent increase in the real exchange rate lowers their current account proxy (namely, the exports-to-imports ratio) by a quarter of a percent. The impact of a 1 percent change in trading partner output on the current account is much larger, at nearly two-thirds of a percent. The impact of domestic output is smaller than foreign output, but it is still significant and higher than the effect of the real exchange rate. A vector autoregression (VAR) model (comprising the current account, the real exchange rate, the repurchase rate, and the production index) reinforces the impression of a weak impact of the exchange rate on the current account in Thailand.⁵

Bayoumi (1996) provides evidence on the strength of exchange rate effects in the five Southeast Asian countries in the sample based on estimates of long-run trade elasticities (see table 3). These estimates suggest that changes in growth (particularly foreign) have a substantial impact on trade balances. Long-run income elasticities in the sample of Southeast Asian countries (including Singapore) average 1.8 for exports and nearly 1.4 for imports, with Thailand having far higher income elasticities than its neighbors. Bayoumi also directly measures

5. Impulse responses indicate that an unexpected (one-standard-deviation) depreciation in the baht has a large impact on the current account (of 0.2 percent of GDP), but the impact subsides thereafter. Introducing exports and imports separately in the model reveals that the real exchange rate has a weak effect on these two variables. In line with this, much of the variance of the forecast error of the current account is due to its own innovations, particularly in the first year. After twenty quarters, own innovations still account for about half of the variance of the forecast error. (In their single equation model, the coefficient on the lagged current account is about 0.6.) Using the Bank of Thailand's larger macroeconomic model, Chayawadee and Jantarangs (2004) find a much larger response of the current account to a real exchange rate depreciation than they do in their own model, but the effect also dissipates over time.

the effect of changes in the real exchange rate on exports and imports; he finds that most of the coefficients are small and statistically insignificant, with the exception of Indonesian imports.⁶

Table 3. Southeast Asia: Long-Run Trade Elasticities^a

<i>Country</i>	<i>Income</i>		<i>Price (real exchange rate)</i>	
	<i>Exports</i>	<i>Imports</i>	<i>Exports</i>	<i>Imports</i>
Indonesia	1.27	1.66	-0.32	0.68
Malaysia	1.86	1.47	-0.53	0.01
Philippines	1.34	1.65	0.10	-0.75
Singapore	1.77	1.05	-0.21	0
Thailand	2.73	1.03	-0.99	0.75
Memo				
Japan	2.10	0.79	-0.69	0.55
United States	1.47	2.46	-0.86	0.26
Panel	1.96	1.46	-0.80	0.28

Source: Bayoumi (1996, tables 3-3 and 3-4).

a. Unless otherwise indicated, the output coefficients are significant at the 1 percent level. The real exchange rate elasticities for exports for Asia are not significant except for Japan (1 percent), while for imports they are only significant in Indonesia (1 percent). Sample period is 1974–93.

Some features of trade in Southeast Asia may explain why exchange rate effects on the current account could be weak. First, exports have a high import content, which generally reflects the importance of manufactured exports in Southeast Asia.⁷ A high correlation between

6. The perception that price effects are low and income effects are high in Southeast Asia was not limited to Bayoumi. Goldman Sachs (1997) reaches the same conclusion. In contrast, the finding that price effects are weak in Southeast Asian trade is contradicted by Marquez (2002). The combination of strong income elasticities and weak price elasticities may explain why Philippine exports sometimes rose while the real exchange rate was appreciating and fell while the real exchange rate was depreciating.

7. For example, according to input-output tables, the import content of exports in Thailand in 1995 ranged from 44 percent for computer and parts to 65 percent for electrical appliances and integrated circuits. In this setting, a depreciation of the currency that boosts exports could simultaneously be associated with an increase in imported inputs. This is also related to the high share of machinery or production inputs in imports and the presence of regional production networks. Indeed, Chayawadee and Jantarangs (2004, pp. 30–31) note that in one version of their VAR model separating Thai exports and imports, both increase in response to a depreciation of the baht. García-Herrero and Koivu (2007) also find that exports and imports (from Asia) in China move in the same direction in response to exchange rate changes. China similarly forms part of a production network in which a significant proportion of imports are used in exports.

merchandise exports and imports is apparent in Indonesia, Malaysia, and Thailand (as well as Singapore), particularly in the first half of the 1990s (see figure 2).

Second, East Asian production networks determine imports and exports in a specific location (Ando and Kimura, 2003), which can dampen the impact of exchange rate fluctuations. A sectoral analysis by Chayawadee and Jantarangs (2004) similarly indicates that real exchange rate changes in Thailand have a relatively small effect on manufacturing trade, but a significant effect on agricultural products. They argue that in the case of Thailand's integrated circuit industry, dominated by multinational firms, the volume of imports is primarily determined by parent company headquarters, rather than changes in the exchange rate.

Third, as noted earlier, Southeast Asian current accounts have significant nonmerchandise trade components, which are price insensitive. The real exchange rate's impact on the current account may thus be weakened further by the small effects on these nonmerchandise components.⁸

One final relevant aspect of the relationship between the exchange rate and the current account in Southeast Asia is that apart from having price effects, the exchange rate had offsetting income effects on the current account through its impact on capital flows. An exchange rate depreciation (or efforts to stem appreciation) that was perceived as unsustainable could worsen the current account balance by increasing capital inflows and, therefore, domestic investment spending.⁹ Pegging influenced capital flows in Southeast Asia, in particular, by exposing these countries to fluctuations of the yen against the U.S. dollar. Research suggests that in periods of yen appreciation, Southeast Asian economies (whose currencies tended to be stable or depreciating against the U.S. dollar) became more attractive destinations for Japanese foreign direct investment (FDI) inflows, while imports in these economies also increased (Goldberg and Klein, 1998). This implies that, at the time, an effective trade-weighted depreciation

8. For example, Chayawadee and Jantarangs (2004) report that real exchange rate fluctuations have little effect on the services account in Thailand. Overseas worker remittances in the Philippines may also be insensitive to exchange rate fluctuations: Vargas-Silva and Huang (2006) find that remittances are more influenced by conditions in the host rather than home country; in particular, exchange rates against the dollar do not help explain remittances in a set of emerging market recipients.

9. Greene (2002) finds that inflows supported domestic investment spending prior to the crisis.

of Southeast Asian currencies could be associated with more capital inflows and larger current account deficits.¹⁰

2. WHY PRE-CRISIS CURRENT ACCOUNT DEFICITS WERE NOT SUSTAINABLE

Large current account deficits were observed up to about 1997 and then reversed sharply. This current account cycle appears to reflect abrupt changes in the availability of capital flows. Starting in the late 1980s, falling U.S. interest rates and recessions in industrial countries stimulated capital flows to Southeast Asia and other emerging market regions, as investors sought higher returns. Exchange rate policies in the Southeast Asian countries also helped attract capital. Capital flows were also supported by favorable domestic macroeconomic conditions, such as sound fiscal policies, rapid growth in output and exports, and relatively stable inflation that was not excessive by emerging market standards (see table A1). All these factors had a positive influence on market sentiment and capital flows.¹¹

The large current account deficits did raise concerns, but a number of arguments were presented to dispel them. These arguments, some of which are still brought up today, are generally founded on three basic issues. First, current account deficits reflected an excess of investment over (high) saving rates, as opposed to high consumption. Second, current account deficits were financed, in some cases, by non-debt-generating inflows, including foreign direct investment.¹² Finally, indicators of external debt sustainability appeared to be favorable. I discuss each of these points in turn.

10. In private correspondence, economists at the Central Bank of the Philippines pointed out a counterintuitive relationship between the exchange rate and export volumes. While the real trade-weighted peso appreciated in 1992, 1996, and 1999, export volume nonetheless grew during the same years. By the same token, real exchange rate depreciation in 1991, 1998, 2001, and 2003–04, was not associated with more rapid export growth. Bautista (2002) suggests that the Philippines' international competitiveness is affected not only by movements in its real exchange rate, but also by trade policies and incentive structures. More generally, the uncertain relationship between real exchange rates and the trade and current accounts in Southeast Asia highlights the importance of a general equilibrium analysis that explicitly takes into account the effects of demand, supply, capital flows, and other factors that might have an important bearing on trade outcomes.

11. In a retrospective study of crises in the 1990s and the IMF's role, Ghosh and others (2002) emphasize the importance of shifts in market sentiment in influencing external balance, in contrast to traditional IMF programs in which macroeconomic imbalances resulted in a gradual deterioration on the external side.

12. Banque Paribas (1995).

The first argument—that current account deficits reflected excess investment rather than high consumption—was often presented in contrast to Mexico, where external deficits were associated with high rates of consumption prior to the 1994 peso crisis, and cases in which current account deficits reflected public deficits. It was widely believed at the time that the association with high investment rates implied that the current account deficits were sustainable. Ostry (1997), using an intertemporal approach, found no evidence of excessive private consumption in Southeast Asian current account deficits, except to a small degree in Indonesia and Malaysia. The absence of excess consumption suggested that the fast-growing Asian economies were not necessarily experiencing the temporary and unsustainable spending booms that characterized the Latin American stabilization programs that lacked policy credibility (see Calvo and Végh, 1999).

A 1995 private sector report refers to the “value-adding” nature of Thailand’s current account deficit as supporting the external valuation of the baht (Union Bank of Switzerland, 1995c). The Monetary Authority of Singapore (1997) draws on Singapore’s own experience to assess the current account deficits in Southeast Asia before the crisis. The study notes that the high investment rates in Southeast Asia were largely attributable to the private sector, which accounted for 76 percent of total investment in Indonesia, 66 percent in Malaysia, and 81 percent in Thailand. These investments had a high import content (resulting in higher import-to-GDP ratios and current account deficits), and estimates indicated that they were highly productive. For example, U.S. multinational investments in three Southeast Asian economies were estimated to have yielded higher rates of return (in US\$) than they did in the European Community, Japan, or the newly -industrialized economies (that is, Korea, Hong Kong, Singapore, and Taiwan).¹³ One indicator that imports were used for investment is the high share of machinery in imports. Ando and Kimura (2003, table 1) estimate that the shares of machinery imports in 1996 were 42 percent in Indonesia, 63 percent in Malaysia, 54 percent in the Philippines, and 50 percent in Thailand.¹⁴ The

13. The Monetary Authority of Singapore (1997) also argued that such imports would eventually increase exports.

14. The shares have since fallen in Indonesia and Thailand, remained stable in the Philippines, and risen in Malaysia. The Monetary Authority of Singapore (1997, table 4) confirms the high share of imports used in production. The shares of intermediate and capital goods in total imports were estimated to have risen sharply between 1975–77 and 1990–94 in Malaysia, Thailand, and Indonesia.

share was also high in Singapore, at 63 percent.¹⁵

The second argument—that current account deficits were financed by non-debt-generating inflows—was supported by studies such as Sachs, Tornell, and Velasco (1996), who, in searching for lessons from Mexico, suggest that this type of financing reduced vulnerability to crises. Frankel and Rose (1996) present similar results. More recently, Levchenko and Mauro (2006) conclude that FDI helps protect countries from sudden stops in capital flows.

This argument was also used to highlight differences between Southeast Asia and Mexico in the aftermath of the 1994 collapse of the Mexican peso.¹⁶ In 1991–97, FDI inflows averaged about 120 percent of current account deficits in Malaysia, 70 percent in Indonesia, 50 percent in the Philippines, and 30 percent in Thailand. The Monetary Authority of Singapore (1997) noted that a high share of FDI financing was one factor that helped sustain Singapore's own large current account deficits, which persisted from 1972 to 1984. FDI accounted for 83 percent of Singapore's current account deficits in that period. It was argued that such financing was an indication that these current account deficits were efficient market outcomes, reflecting the flow of international capital to countries with the highest returns.

A third argument was that indicators of external debt sustainability appeared to be favorable. The ratios to exports of external debt and debt service payments were generally low or seemingly manageable. Until 1995, export growth in a number of countries appeared to be more than adequate to cover existing current account deficits, so that the debt-to-exports ratios would converge to a level that could be serviced (not exceeding two digits).¹⁷ Ratings upgrades in 1995 typically cited rapid growth, as well as growth-boosting structural reforms (for example, the Moody's upgrades for Malaysia and the Philippines).¹⁸

2.1 Shocks and Vulnerabilities

In this setting, a number of shocks starting in late 1994 led to a progressive deterioration in market sentiment, while uncovered

15. The perspective of the Monetary Authority of Singapore (1997) is of interest because it highlights some of the rationale for policies followed by Southeast Asian economies. A fuller exposition (and defense) of the Asian approach to development is provided by Stiglitz (1996). Corsetti, Pesenti, and Roubini (1999) offer a critical view.

16. For example, see N. Sophe, "We Are Not Going down Mexico Way," *New Straits Times* (Malaysia), 14 March 1995.

17. Dadush and Brahmhatt (1995).

18. For a discussion of how the Philippines was perceived, see T. Shale, "Has the Philippines Found Its Feet?" *Euro money*, September 1995.

vulnerabilities triggered currency collapse and a massive capital flow reversal in the region. Three shocks were prominent in the press and analysts' commentary: the Mexican peso crisis; the slowdown in exports and the drop in the terms of trade; and the collapse of the Thai baht.

The collapse of the Mexican peso in December 1994 led to market volatility and a debate on the extent to which Southeast Asian economies might (or might not) be as vulnerable as Mexico, which also had large current account deficits prior to its currency crisis. For example, an analysis by a U.S. investment advisor suggested that four of the seven countries whose currencies were most vulnerable to devaluation after the Mexican peso collapse were in Southeast Asia (namely, Indonesia, the Philippines, Malaysia, and Thailand).¹⁹ Although sentiment stabilized after a period of market volatility, there were lasting effects on interest rates in some countries.²⁰

The sharp slowdown in export growth in 1996 affected Thailand most severely. After growing nearly 25 percent in 1995, Thailand's export revenues in dollars fell 1.3 percent in 1996. This partly reflected a significant drop in the terms of trade (see table A1). Export growth also fell sharply in Malaysia (26 percent to 5.8 percent) and the Philippines (32 percent to 17 percent) and more moderately in Indonesia (13.4 percent to 9.7 percent). The reasons cited for this slowdown included a significant decline in manufacturing export prices, most notably for semiconductors and other electronics products, and an appreciation of the dollar against the yen, which caused Southeast Asian effective exchange rates to appreciate (see Goldman Sachs, 1997). In Thailand, the slowdown in economic activity was associated with a significant shift in market sentiment starting in early 1996, as reflected in declining stock prices that did not hit other countries until later. Property markets were also adversely affected, which severely impaired the financial position of certain financial institutions. Press reports suggest that news of the drop in export growth in 1996 raised significant concerns about the sustainability of exchange rates and current account deficits.

19. A *Fortune* article triggered rebuttals from Malaysian commentators; see L. Smith, "After Mexico, Who's Next?" *Fortune*, 6 March 1995. The three other countries listed as vulnerable were in Latin America (namely, Argentina, Brazil, and Chile).

20. For alternative views on who was vulnerable and who was not, see Union Bank of Switzerland (1995a), Sachs, Tornell, and Velasco (1996), and "No, Manila Is Not Mexico," *The Economist*, 11 March 1995.

Finally, the shocks cited above triggered sporadic episodes of speculative pressure, particularly against the Thai baht from 1995 onward. The eventual collapse of the baht in July 1997 triggered depreciations in the exchange rates of Indonesia, the Philippines, and Malaysia. Current account deficits switched sharply into surpluses around this time, reflecting the sudden withdrawal of external financing.

The fact that current account deficits reflected high investment rather than consumption, together with the large share of FDI in financing, did not prevent a sudden stop and costly current account reversal. A number of factors made economies vulnerable to adverse shifts in market sentiment: (a) growing overinvestment; (b) financial fragility; (c) low foreign reserve cover for short-term external debt, accentuated by the fact that short-term debt was underestimated; and (d) currency mismatches.²¹

2.1.1 Overinvestment

Despite the positive factors identified by the Monetary Authority of Singapore (1997) and Stiglitz (1996), rapid capital accumulation resulted in overinvestment and an inefficient use of resources in Southeast Asia up to about 1997. Corsetti, Pesenti, and Roubini (1999), who acknowledge the high marginal efficiency of investment in East Asia, find that incremental capital output ratios rose in Asian economies prior to the crisis, suggesting a deterioration in efficiency. Even before the crisis, the governor of Bank Indonesia expressed concern about economic inefficiency, as reflected in high incremental capital output ratios.²² In the case of Thailand, the first half of the 1990s was characterized by reductions in the marginal productivity of capital, declining total factor productivity growth, low returns on assets, and falling capacity utilization (Roong, Thaicharoen, and Rodpingsangkaha, 2003, pp. 17–19 and 23–24).²³

21. An alternative view is that the Asian crisis was largely an unanticipated panic and economies were vulnerable regardless of their fundamentals (Sachs and Radelet, 1998). However, the broader discussion and empirical evidence suggests that there was ongoing debate as to the vulnerability of Asian economies after the collapse of the Mexican peso and that fundamentals did play a role in vulnerability to crises. The clearest example of this is provided by Singapore, which experienced a massive real sector shock but no financial or currency crisis.

22. "Soedradjad Bemoans Economic Inefficiency," *Jakarta Post*, 19 December 1996.

23. See Sarel (1997) for graphs illustrating declines in the marginal product of capital in Southeast Asian countries between 1990 and 1996.

2.1.2 Financial fragility

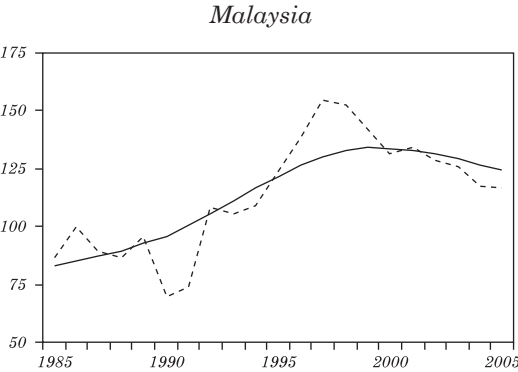
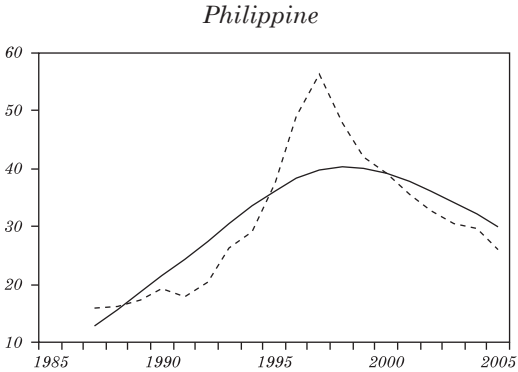
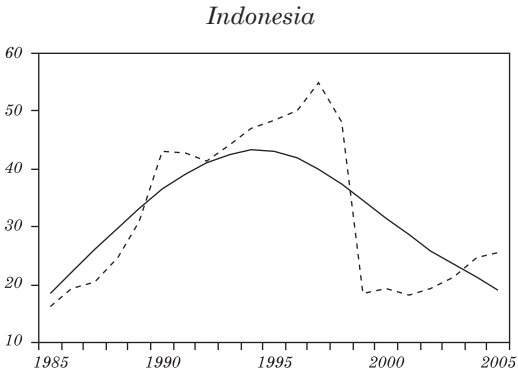
The Southeast Asian economies showed signs of rapid growth in risky lending.²⁴ Domestic credit to the private sector picked up sharply in the first half of the 1990s, triggering booms in equity and property markets. The ratio of credit to GDP rose from around 70 percent in 1990 to over 150 percent in 1997 in both Malaysia and Thailand (see figure 3). Over the same period, it rose to 50 percent in both Indonesia and the Philippines, although more sharply in the latter. These increases were partly the result of desirable financial deepening, but examination of banks' asset quality suggests that a considerable proportion of the lending posed significant risks. In the case of Thailand, Moody's expressed concern in early 1995 that credit continued to grow rapidly despite signs of overdevelopment, including the existence of more than 350 golf courses and high property vacancy rates.²⁵ Nevertheless, Moody's said it was not considering downgrading the credit ratings of Thai banks. Most of the large banks reportedly met Basel I capital adequacy requirements and maintained reserves equal to the size of their doubtful loans. Financial sector weaknesses were also recognized in other countries in the region. For example, at a press conference in November 1996, the governor of Bank Indonesia expressed concern for the growing concentration of bank credit in the property sector (over 18 percent of total credit), which had increased 26 percent from January to September 1996. In 1996, a study by the Central Bank of the Philippines found that property prices in three business districts in Manila had risen between 150 and 230 percent since 1994; the central bank's governor at the time indicated that limits on credit to the property sector were being considered as a result.²⁶ Certain prudential measures adopted in Malaysia also indicate concerns about developments in property markets. The central bank set a maximum loan-to-value ratio of 60 percent on loans to the real estate

24. For a discussion of varying sets of macroeconomic and financial indicators and what they implied for Asian economies, see Milesi-Ferretti and Razin (1996) and Glick (1999).

25. See P. Montagnon, "Moody's Warns of Thailand Bubble." *Financial Times*, 9 February 1995. A rapid increase in commercial bank lending to the private sector in the years before the 1994 peso crisis is one of the key vulnerabilities highlighted by Sachs, Tornell, and Velasco (1996).

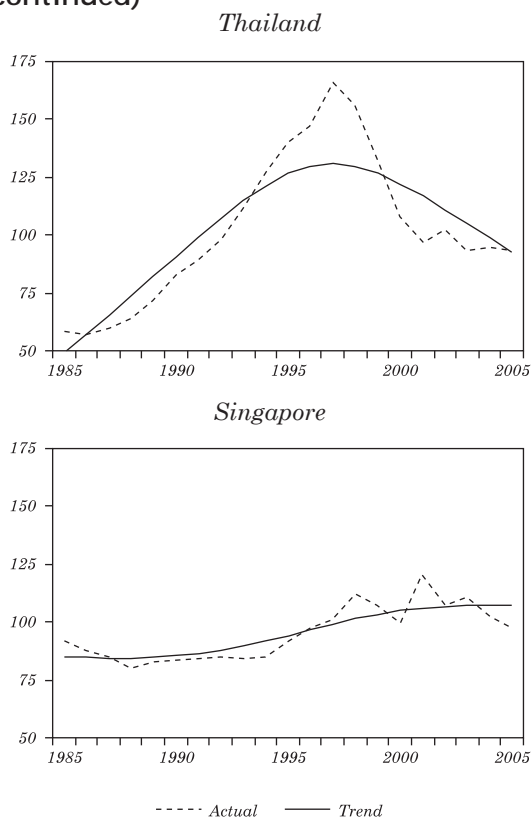
26. See "Indonesia Property Sector Credit Volume up 26 pct." *Asia Pulse*, 12 November 1996; see also J. Marozzi, "Manila Ponders Lending Limits," *Financial Times*, 11 December 1996.

**Figure 3. Domestic Bank Credit to the Private Sector
Percent of GDP**



- - - - Actual ——— Trend

Figure 3. (continued)



Sources: IMF; BIS calculations.

a. Trend series are estimated using a Hodrick-Prescott filter applied to annual data.

sector. It also raised reserve requirements to limit the rapid credit growth for consumption, which was seen as unproductive. Efforts were also made to cut the link between capital flows and domestic liquidity creation.

A number of explanations have been offered for Asia's growing financial fragility. First, the economies suffered from a series of credit market imperfections. Koh and others (2005) provide empirical evidence suggesting that financial intermediaries in Indonesia, Malaysia, and Thailand underpriced lending (specifically, the implicit option to default by borrowers) in property markets, leading to a boom and bust in property prices. The underpricing may have stemmed from lender optimism or disaster myopia in the boom period, from

incentives that distort lending decisions, such as implicit guarantees by authorities, or from agency conflicts (for example, between banks and their borrowers or among shareholders).

Incentives or implicit guarantees by authorities could be particularly important in Southeast Asia, where the banking sector supported an economic strategy oriented toward rapid economic growth. With regard to agency conflicts, Johnson and others (2000) report that weaknesses in corporate governance in Asia created a situation in which majority shareholders could step up their expropriation of the claims of minority shareholders during periods of investor uncertainty, leading to capital inflow reversals, falling stock prices, and currency depreciation. They find that weaknesses in corporate governance were a better predictor of currency depreciation than more widely used macroeconomic indicators. Relationship lending is another relevant market imperfection. Rajan and Zingales (1998) hold that Asia's traditional relationship-based system of credit extension contributed to resource misallocation in the presence of large capital inflows by suppressing price signals. Moreover, because suppliers of external capital have few rights in a relationship system, they limited their risks by lending short term, which made the economies more vulnerable to sudden reversals in capital flows.²⁷ In particular, the withdrawal of short-term funds could create liquidity problems for banks, leading them to recall their loans and forcing borrowers to cancel projects. This mechanism appears to have contributed to the severe economic downturns observed during the Asian crisis.

Second, there were weaknesses in the prudential policies in place. Bongini, Claesens, and Ferri (2001) analyze a sample of 283 financial institutions in Southeast Asia and Korea during the Asian financial crisis. One hundred and twenty of these experienced distress and 38 were eventually closed. The authors identify two predictors of distress: (a) variables that are typically monitored by banking supervisors using the CAMEL supervisory approach; and (b) connections with industrial groups or influential families, which the authors interpret as implying forbearance. These predictors suggest that difficulties in prudential supervision might have played a role in increasing financial vulnerability.

Apart from playing a role in predicting financial distress, financial fragility appears to have directly contributed to market perceptions

27. An alternative explanation for the emphasis on short-term lending by foreign creditors is lack of familiarity with domestic conditions.

of the sustainability of exchange rate regimes in Southeast Asia and the eventual interruption in external financing. For example, early in 1997 an investment bank raised its assessment of the probability of a baht devaluation, partly because financial sector problems associated with a sharp downturn in property markets would make it very costly for the Bank of Thailand to raise interest rates to defend the currency.²⁸ Press reports suggest that the analysis triggered a bout of speculation against the baht shortly after it was published. The speculation continued intermittently until the collapse of the currency in July 1997. While interest rates in Thailand did rise over the period as liquidity vanished from financial markets, the desire to dampen any interest rate hikes may explain why the Bank of Thailand depleted its foreign reserves significantly during this period to defend the peg.²⁹

2.1.3 Low foreign reserve cover

Recent research on early warning systems by Bussière and Fratzscher (2006) confirms that low foreign reserve cover of short-term debt is a predictor of crises. The foreign reserve cover of short-term debt in 1996 was below the (now) conventional threshold of one in Indonesia and Thailand (see table 4). If the need to cover current account deficits (measured ex post) in the following year is also taken into account, then the foreign reserve cover exceeded one only in Malaysia (1.4 in 1996). Moody's widely publicized downgrading of Thailand's sovereign debt in September 1996 was motivated by the rapid and recent accumulation of short-term external debt, which by some estimates slightly exceeded foreign reserves. In contrast, Malaysia's rating remained high for an extended period partly because of its high foreign reserve cover of short-term debt. Standard and Poor's downgraded Malaysia's sovereign rating in 1998, but the rating remained comparatively high in part because liquid international reserves were estimated at 170 percent of short-term external debt.³⁰ An important

28. See S. Kim, "Baht under Pressure," *Goldman Sachs Asian Weekly Analyst*, 5 February 1997. The analysis was related to Kaminsky and Reinhart's (1999) research linking banking crises and currency crises, which first appeared in 1996 as a working paper.

29. For a general discussion of this episode, see Moreno (1997).

30. "Malaysia's Ratings Cut By S&P; Outlook Now Negative," *Standard and Poor's CreditWire*, 24 July 1998 (available at findarticles.com/p/articles/mi_m0EIN/is_1998_July_24/ai_50195223). Malaysia's high foreign reserve cover was deliberate. Cheong (2002) points out that Malaysia implemented a policy of maintaining a foreign reserve cover of at least one well before it was suggested by Greenspan.

factor is that while FDI was indeed important in financing current account deficits, debt exposures were apparently underestimated in a number of countries. For example, the International Monetary Fund's Independent Evaluation Office (2003, pages 12 and 26) states that Indonesia's debt exposure was underestimated, particularly its short-term debt. Furthermore, market commentary indicates that officials could not closely monitor private lending flows (Union Bank of Switzerland, 1995b).³¹ Finally, apart from the debt burden being higher than was thought at the time, the share of short-term debt was sufficiently high to pose illiquidity risks.

Table 4. Foreign Exchange Reserves / Short-Term External Debt Ratio^a

<i>Region or country</i>	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Southeast Asia ^b	1.2	0.7	1.3	2.2	2.3	2.3	2.8	3.0	2.9	2.5
Indonesia	0.5	0.4	0.9	1.3	1.3	1.6	2.3	2.6	2.1	1.9
Malaysia	2.3	1.3	2.5	3.7	3.6	3.3	3.4	4.1	3.8	3.2
Philippines	1.2	0.8	1.1	1.7	1.8	1.7	2.0	2.1	2.1	2.0
Thailand	0.8	0.7	1.1	2.2	2.5	2.7	3.9	4.0	4.4	3.7

Source: IMF; national data; BIS.

a. Short-term external debt defined as short-term liabilities to BIS reporting banks: consolidated cross-border claims to all BIS reporting banks on countries outside the reporting area with a maturity up to and including one year plus international debt securities outstanding with a maturity up to one year; based on outstanding year-end positions

b. Unweighted averages of the countries shown.

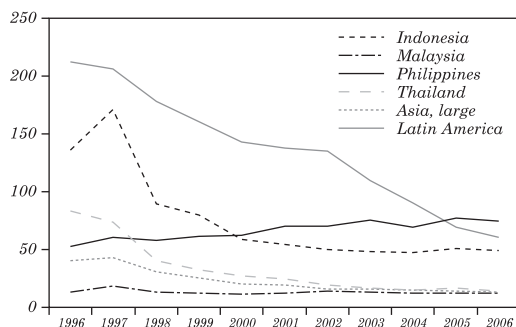
2.1.4 Currency mismatches

A significant amount of foreign currency borrowing in Southeast Asia was either unhedged or not effectively hedged. Such mismatches partly explain why the Asian currency crises of 1997–98 were associated with sudden stops in capital flows and sharp contractions in

31. The estimated external-debt-to-exports ratios for 1995 in table A1—which are based on revised data that use BIS creditor statistics to supplement reports by the debtor countries—are much higher than estimates provided by one investment bank at the time. The investment bank estimated Thailand's debt-to-exports ratio at 103 percent, versus a revised estimate in table A1 of 177 percent; for the Philippines, the two figures are 135 percent versus 225 percent, and for Indonesia, 184 percent versus 274 percent. The two estimates are similar only in the case of Malaysia (43 percent according to the investment bank versus 46 percent in the table). Another investment bank (Union Bank of Switzerland, 1996) used BIS statistics to obtain an estimate of external borrowing in Indonesia.

output while other currency crises were not. As a currency comes under depreciation pressure, the balance sheets of borrowers who have not hedged their foreign currency positions deteriorate sharply, as do those of their domestic bank lenders. This can lead to sharp reductions in expected returns and output, triggering sharp withdrawals in external financing as occurred in Asia in 1997–98. The precise dimensions of the problem were apparently not well understood at the time. For example, an Independent Evaluation Office (2003, page 26) report indicates that there was insufficient exploration of balance sheet risks, including those arising from currency (or maturity) mismatches in Indonesia. The difficulties of dealing with currency mismatches are illustrated by Allayanis, Brown, and Klapper (2000), who find that firms in East Asia tended to use foreign earnings as a substitute for hedging with derivatives. They also find, however, that firms that hedged with derivatives did no better during the Asian crisis than firms that did not hedge. One possible explanation is that the derivatives markets could not handle the sudden stops associated with the Asian crisis. The primary source of cover for meeting foreign currency obligations or managing foreign currency risks in this situation would either be the foreign reserves of the central bank (discussed above) or export revenues. To provide some perspective on the latter, figure 4 illustrates the foreign currency share of total debt divided by the ratio of exports to GDP, which serves as an indicator of the extent to which

Figure 4. Indicators of Currency Mismatch^a
Percent



Sources: IMF; national data; BIS.

a. Foreign currency share of total debt divided by the ratio of exports to GDP, in percent. Asia is the weighted average of China, India, Korea, and Taiwan (China). Latin America is the weighted average of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

foreign currency borrowing is not naturally hedged by exports.³² In 1997, this ratio was highest in Indonesia and then Thailand, the two countries most severely affected by the crisis. The ratio was rising in the Philippines, and it was remarkably low in Malaysia.

3. POLICY RESPONSES

Current account deficits in Southeast Asia were an ongoing concern for policymakers throughout the first half of the 1990s.³³ Nevertheless, this concern appears to have been outweighed by the goal of maintaining rapid growth rates to achieve developed-country status. Early in the 1990s, when growth in major developed economies was sluggish, the Bank of Thailand (1992, p. 9) stated that the current account deficit reflected a shortfall in national saving that constrained long-run growth opportunities. Starting around 1994, when growth had picked up, commentators began to describe current account deficits as a sign of overheating and as an apparent proxy for the output gap.³⁴ After the December 1994 collapse of the Mexican peso, press reports and market commentary indicate growing awareness by people concerned with economic issues that such deficits could pose risks to economic stability, and that there could be a need to tighten fiscal or monetary policy, not only to curb inflation but also to reduce the high current account deficits. For example, in discussing the effects of monetary policy tightening, the governor of Bank Indonesia highlighted the impact on imports and sought to alleviate concerns about the large current account deficits.³⁵ The governor of the Bank of Thailand announced that monetary policy would proceed in “a cautious mode with the aim of reducing the current account deficit” and cited the central bank’s intention to keep inflation below five percent and the current account deficit below eight percent of GDP.³⁶

32. This indicator is also used by Goldstein and Turner (2004).

33. The discussion in this section refers to policy responses that have a bearing on the current account, dating to the early 1990s. For a general discussion of policy responses to capital inflows, which were a key consideration during that period, see Corbo and Hernández (1996). For more details on responses from 1995 onward, see, for example, Corsetti, Pesenti, and Roubini (1999).

34. For example, see various issues of Morgan Guaranty’s *World Financial Markets* of the period.

35. Cited by Riyadi, “Govt. Vows to Cool Down Economy,” *Jakarta Post*, 26 December 1996.

36. “Central Bank to Restrict Use of Monetary Policy in 1997,” *Agence France Presse*, 26 December 1996.

The IMF's advice in this period has not been fully disclosed, but the organization's traditional model and publicly available information indicate that reducing current account deficits was a priority. For example, in addition to boosting growth, the IMF's 1994 program for the Philippines sought to lower inflation, thereby enhancing competitiveness with a stable exchange rate, and reduce the current account deficit to a sustainable level of about 2.5 percent of gross national product (GNP) by 1997, from about 6 percent in 1993.³⁷ In 1995, the IMF representative to the Philippines suggested that the country was less vulnerable than Mexico because it had a smaller and falling current account deficit, as well as a lower debt service ratio, a lower share of short-term debt, and more flexible exchange rates.³⁸ The Independent Evaluation Office (2003, p. 62) discussion of the Article IV consultation missions to Indonesia notes that the 1996 mission advice was "that the authorities should follow tight fiscal and monetary policies." In 1997 it also called for "greater exchange rate flexibility and accelerated structural and banking reforms to maintain progress in reducing inflation, contain current account deficits, and minimize external risks." The viewpoint that current accounts should be reduced influenced the policy inferences that were drawn from IMF research. For example, notwithstanding his conclusion that current account deficits in Southeast Asia did not reflect excess consumption, Ostry (1997) argues that risks from other factors (such as the level and composition of external liabilities, flexibility of macroeconomic policies, and the health of banking systems) would justify reducing current account deficits.

To reduce current account deficits, policymakers could seek to increase private or public saving or lower investment spending. Although investment spending was a major driver of the current account cycle, the authorities were reluctant to curb it because it was a centerpiece of these countries' development strategies. It was argued that investment could increase production capacity and lower cost pressures and future current account deficits.³⁹ In Thailand, reducing government investment spending would have affected infrastructure projects needed to ease severe bottlenecks impeding growth. Indeed,

37. For a discussion, see "Philippines: Manila Transformed," *The Banker*, 1 September 1994.

38. "No, Manila Is Not Mexico," *The Economist*, 11 March 1995.

39. For an example of reasoning along these lines, see the Bank of Thailand's *Annual Economic Report, 1995*, as well as the Monetary Authority of Singapore (1997). The focus on the supply effects of investment, as opposed to its impact on the external balance via aggregate demand, is still apparent in discussions of China today, where there is concern that investment in some sectors might lead to excess capacity.

government spending in these areas was seen as lagging throughout the first half of the 1990s and was not considered the proximate cause of current account deficits. Investment was also a key element of Malaysia's efforts to achieve developed country status by 2020. Bank Indonesia similarly cites the dilemma of pursuing both the goals of macroeconomic stability and the benefits of high investment: its annual report (1992/3, p 3) cites efforts to dampen domestic demand since 1990, but expresses concern about the slowdown in investment activity in 1992/93, which authorities believed could have an adverse impact on economic growth and exports in coming years.

Policymakers instead sought to encourage private saving, in particular through the development of saving vehicles for households.⁴⁰ For example, the Bank of Thailand consistently highlighted the need to develop provident funds for employees. Such efforts to raise household saving in Thailand were not very successful, however. National saving was very high, but the household saving rate fell by over half between 1989 and 1996, to around 7 percent (Pootrakul, Ariyapruchya, and Sodsrichai, 2005, chart 2.6, p. 9). An important medium-term factor accounting for this decline appears to have been a consumption boom. At the same time, it is not clear that efforts to increase private saving would have reduced current account deficits. In their study of a larger set of developing countries, Calderón, Chong, and Loayza (2002) find that private saving and investment are tightly linked, while public saving and investment are not. The empirical evidence available today thus suggests that increasing private savings would not necessarily have helped reduce current account deficits, whereas increasing public savings might have.⁴¹

Increasing public saving was, in fact, considered, although in some ways, this had already occurred. Budgets in many cases were in surplus or were deemed sound or improving. The ratio of public debt to GDP was generally low: in 1996 it was estimated at 3.8 percent in Thailand, 15 percent in Indonesia, and 35 percent in Malaysia. The Philippines had a considerably higher ratio than its neighbors, at 56 percent, but the Philippine budget recorded surpluses in 1994–96 after a period of persistent deficits (see table A1). Measurement issues arose here, too. Fiscal positions were arguably not as sound as they appeared because they did not reflect possible contingent liabilities

40. See, for example, the discussions in the Bank of Thailand's and Bank Negara Malaysia's annual reports.

41. Further research is needed to determine the applicability of these results to Southeast Asian economies.

arising from fragile financial sectors (which today would be assessed through macroeconomic stress testing).

Market sentiment changed around the mid-1990s, generating calls for fiscal policy to support current account deficit reduction. For example in 1996, the Indonesian finance minister promised to maintain fiscal surpluses in an effort to cool down the economy.⁴² In its *Annual Economic Report 1996* (p. 8), the Bank of Thailand called on the government to reduce expenditures; this contrasts with earlier reports, which cited expenditure shortfalls. The report also called on the government to expand the tax base, particularly through consumption taxes, so as to increase public and private saving.

In this setting, much of the burden of dealing with overheating and current account deficits arguably fell on monetary policy. However, the scope for an independent monetary policy in the first half of the 1990s was limited by efforts to stabilize exchange rates against the U.S. dollar.⁴³ As illustrated in figure 5 the baht was very stable against the dollar, as was the Philippine peso after late 1995. The Malaysian ringgit was more volatile, but it was largely trendless against the dollar until the collapse of the Thai baht in July 1997. Indonesia maintained a crawling depreciating band against the US dollar of around 4–5 percent a year.

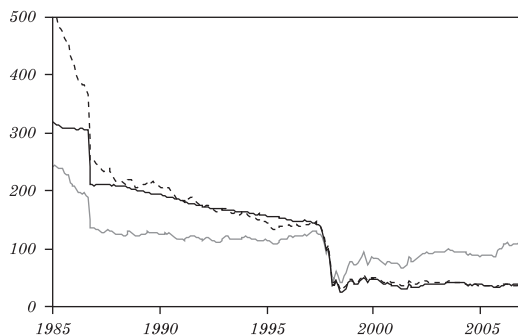
In the first half of the 1990s, central bank intervention to prevent the exchange rate from appreciating was reflected in significant foreign reserve accumulation (table 1). This increased liquidity and contributed to the boom in credit and investment and the growing financial fragility cited earlier. Monetary authorities responded by applying a variety of tools to drain liquidity. First, they increased reserve requirements. Malaysia increased its reserve requirements eight times between 1990 and 1997, while Indonesia did so twice for rupiah deposits (Van 't Dack, 1999, table 7). Second, government or provident fund deposits with the central bank were increased (for example, Malaysia). Finally, the authorities undertook standard sterilization operations involving short-term borrowing from the money market, which in some cases (such as Indonesia, Malaysia, and Thailand) required the issuance

42. Riyadi, "Govt. Vows to Cool Down Economy," *Jakarta Post*, 26 December 1996.

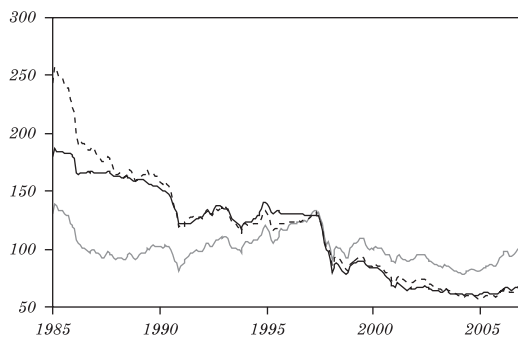
43. Frankel and Wei (1994) show that East Asian currencies behaved like basket pegs with a high weight assigned to the U.S. dollar; the Monetary Authority of Singapore (2000) updates this study and shows that the role of the yen increased after the Asian crisis. Hernández and Montiel (2003) show that exchange rate volatilities in Asian currencies were low prior to the crises and rose significantly afterward, but less than pure floaters. Stabilizing the exchange rate was arguably also part of a high-growth strategy; see Dooley, Folkerts-Landau, and Garber (2004).

Figure 5. Exchange Rates^a
1990–2005 = 100

Indonesia



Philippines

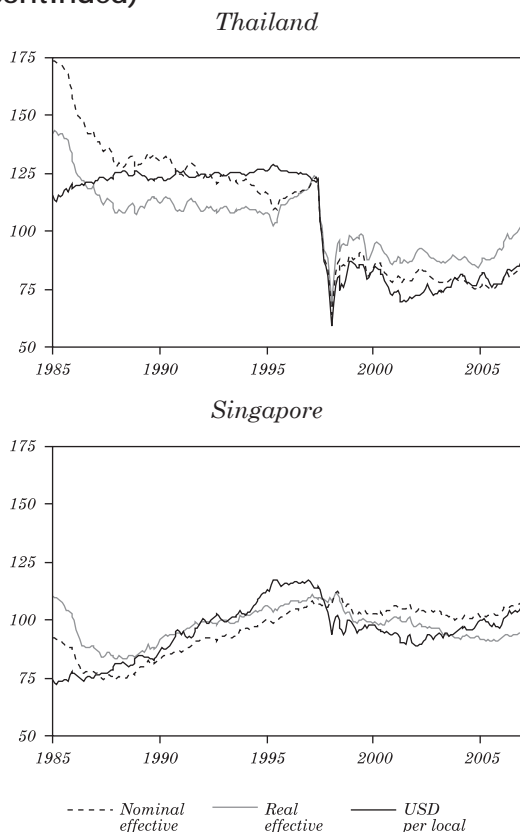


Malaysia



----- Nominal effective — Real effective — USD per local

Figure 5. (continued)



Sources: IMF; Bloomberg; Datastream; national data; BIS.

a. Monthly averages. An increase indicates an appreciation. The real effective rate is in terms of relative consumer prices.

of central bank instruments, owing to the lack of government paper. Given efforts to stabilize the exchange rate, these attempts to mop up liquidity attracted more capital inflows, which complicated monetary control.⁴⁴ This is an implication of the Mundell-Fleming model and a feature of discussions of the so-called impossible trinity.

The outcomes for exchange rates are illustrated in figures 5 and 6. Domestic monetary policies were significantly influenced by external conditions. Although occasionally disguised by high volatility,

44. For a discussion of the problems of dealing with surging capital inflows, see Bank Negara Malaysia (1993, 1999), Cheong (2002), and Glick and Moreno (1994, 1995).

Significant tightening in monetary conditions only becomes apparent after 1995. Real short-term rates rose between 1995 and 1997 in all four Southeast Asian countries, albeit with more volatility in Thailand (specifically, a significant dip in the second half of 1995). Real effective exchange rates also appreciated after 1995. Prior to that, nominal effective exchange rates had been on a depreciating trend and real exchange rates were generally flat, following a period of depreciation in the 1980s. The real exchange rate of Singapore appreciated steadily from 1985 onward; throughout the period, the country maintained large surpluses. The extended period of stable real exchange rates in the other Southeast Asian countries is remarkable because the very rapid growth of these economies and the importance of the tradable goods sector in this process suggest that exchange rates should have appreciated as a result of Balassa-Samuelson effects. Empirical research reveals that Balassa-Samuelson effects are not present in the countries in the sample.⁴⁵

Exchange rate appreciation thus did not play a direct role in the large trade or current account deficits in the first half of the 1990s.⁴⁶ Effective exchange rate appreciation may have been a factor in declining exports in 1996, contributing to market uncertainty and pressures on currencies, particularly in Thailand. Nevertheless, empirical evidence of overvaluation prior to the Asian crisis is mixed (see, for example, Chinn, 1998).

Would allowing the exchange rate to adjust more freely have helped reduce current account deficits prior to the crisis in Southeast Asia? More flexible exchange rates would probably have had different effects in different periods. Before the Mexican peso collapse in December 1994, allowing the exchange rate to float freely would most likely have resulted in currency appreciation. Paradoxically, while freeing the exchange rate might have lowered export growth and increased imports through price effects, it could have reduced imports through income effects, specifically by dampening capital inflows and investment demand and by giving monetary authorities more scope to tighten. In any case, policymakers acted as if exchange rate stability mattered a great deal. Cheong (2002) indicates that freeing

45. Drine and Rault (2004) find that the Balassa-Samuelson approach implies that the productivity differential between traded and nontraded goods sectors should be cointegrated with the corresponding relative prices; this is rejected by the data. One explanation is that there are other factors determining the real exchange rate that are not being taken into account.

46. A similar point is made in BIS (1996).

the exchange rate was not considered an option by Malaysia, in part because financial markets tend to overshoot and excessive volatility could threaten macroeconomic stability.⁴⁷ There was also concern in the region that appreciation would have hurt exporters, accentuated by growing competition with China in low-cost manufactures.

After the Mexican peso crisis, the effects of allowing more exchange rate adjustment are uncertain, as there were occasional periods of depreciation pressure. The debates on the appropriateness of allowing currencies to depreciate to reduce current account deficits became more pointed in 1996, when export revenue growth declined sharply.⁴⁸ Efforts to stabilize the exchange rate nevertheless continued in the region until the Thai baht collapsed; these stabilization efforts are partly reflected in high interest rates in 1997. Efforts to defend pegs by allowing interest rates to rise were criticized for their contractionary effects, but they may have been motivated by the high costs of devaluation resulting from currency mismatches.

3.1 Prudential Measures and Capital Controls

Apart from macroeconomic policies, and despite generally open capital accounts, Asian policymakers occasionally adopted measures that could influence the size of the current account or its perceived sustainability. First, a set of measures whose motivation was “prudential” was designed to limit vulnerabilities. Second, controls were put in place to stop destabilizing speculation in currency or asset markets and to increase monetary policy independence.

With regard to the first set of measures, several countries maintained restrictions on foreign borrowing or sought to influence it through regulation. In 1991, Indonesia imposed limits on foreign borrowing by the public sector (including private contracts with the public sector) and by banks, but these limits did not extend

47. Latifah Merican Cheong was, at the time, a senior official at Bank Negara Malaysia.

48. For example, the Philippine Socioeconomic Planning Secretary, Cielito Habito, was quoted in August 1996 as saying that the peso was overvalued and foreign exchange policy was inadequate to control the country's trade gap (see “Official Calls for Look at Forex Policy,” United Press International, 16 August 1996). That same month, Bank Indonesia Governor Soedradjad defended Indonesia's exchange rate policy by saying it should not be designed merely to boost exports. This was partly in response to questions about a statement by Indonesia's finance minister that the rupiah was slightly overvalued (see “Indon Forex Policy Not Only for Exports: Banker,” *Asia Pulse*, 9 August 1996).

to the private nonbank sector. Malaysia largely liberalized its capital account in 1973, but it maintained a set of foreign exchange controls that required approval on external borrowing above certain thresholds. Most (mainly long-term) external loans were only approved if firms earned foreign exchange. Cheong (2002) indicates that the goal of this restriction was largely prudential (that is, to ensure that entities incurring debt were able to service it), and it was not aimed at limiting borrowing per se. In the Philippines, public and private sector borrowing from abroad was subject to central bank approval in the mid-1990s. Controls were minimal in Thailand, although public sector foreign borrowing required approval by a foreign debt committee. For the private sector, the Bank of Thailand tried a somewhat different approach, implementing bank regulations to reduce the incentives for overseas financing. For example, in 1995, it sought to increase banks' reliance on domestic deposits (as opposed to external borrowing) by requiring banks with high loan-to-deposit ratios to lower them toward the industry average. It also modified the net foreign exchange position limit imposed on commercial banks by counting at less than 100 percent (in some cases zero percent) foreign assets or certain types of commercial bank credits in foreign currencies that the Bank of Thailand deemed risky (such as those for purchasing vacant lands and for personal consumption).

The effectiveness of these measures varied. Foreign borrowing by Indonesian firms contributed significantly to currency mismatches and the severity of its crisis, suggesting that its restrictions on foreign borrowing were not sufficiently effective to avert a crisis.

As for the second set of measures, the main example in this period is that of Malaysia, which implemented a set of (temporary) controls directed at capital inflows in early 1994.⁴⁹ The controls Malaysia imposed were motivated by three considerations.⁵⁰ First, capital inflows were large, rising from 3 percent of GDP in 1988 to 20 percent in 1993. Foreign capital was attracted by the high rates of return in Malaysia, buoyant equity markets, and expectations of ringgit appreciation. Second, while a large share of net capital

49. For discussions of this episode, see Bank Negara Malaysia (1993 pp 61–62, 1999) and Glick and Moreno (1995). Another well-known example is Thailand's attempt to curb speculation against the baht in May 1997 by limiting the ability of foreign residents to borrow baht and restricting links between the offshore and onshore markets. I do not focus on this here because these measures had no direct connection with efforts to influence current account balances and do not appear to have been effective (Edison and Reinhart, 2002).

50. Cheong (2002) addresses some of these points.

inflows were initially direct investment, other capital inflows became increasingly important as time passed, including short-term inflows and foreign borrowing through the banking sector. Third, the capital inflows circumvented existing controls and significantly eroded central bank measures to tighten liquidity. In an effort to discourage speculative flows, Malaysia had previously imposed ceilings on non-trade-related swap transactions between commercial banks and their foreign customers (on the offer side on 14 March 1989 and on the bid side on 1 June 1992). Bank liquidity continued to increase, however, due to unrestricted trade and investment inflows. The central bank was particularly concerned about sharp ringgit appreciation against the dollar (around 9 percent between December 1993 and January 1994), since “allowing the ringgit to appreciate sharply... from the inflows of funds that were of a very short-term nature would run the risk of an overshooting of the exchange rate. Any sudden reversals of the flows would have resulted in reverse pressure on the currency” (Bank Negara Malaysia, 1999, p. 289).

In response to these concerns, in January and February 1994, Bank Negara Malaysia imposed restrictions that limited foreign access to Malaysia’s banking sector and short-term financial instruments.⁵¹ Most of the restrictions were lifted within a year. These controls could have affected Malaysia’s current account in two ways. First, they could have heightened monetary policy independence and facilitated monetary policy tightening to reduce current account deficits, if policymakers so desired, by allowing interest rates to be increased without triggering capital inflows or appreciation pressures. As illustrated in figures 5 and 6, the controls were associated with a ringgit depreciation against the U.S. dollar, which by August 1994 had offset the sharp appreciation cited earlier. The imposition of controls was also initially associated with a visible drop in Malaysian interest rates, followed by a rise that broadly tracked the increase in the Federal funds rate until the beginning of 1996. The gap between the Malaysian overnight rate and the U.S. Federal funds rate fell from nearly 4 percentage

51. The central bank imposed a ceiling on the net external liability position of domestic banks (excluding trade-related and direct investment inflows); prohibited sales by residents to nonresidents of short-term securities (such as banker’s acceptances, negotiable certificates of deposit, Bank Negara or Treasury bills, government securities maturing in one year or less, and any private security with a residual maturity of one year or less); prohibited bid-side commercial banks forward transactions with foreigners and nontrade related swaps.

points in November 1993 to around 41 basis points in January 1994; it later turned negative until about the fourth quarter of 1995. The controls thus appear to have stemmed appreciation pressures, and Malaysian authorities appear to have been able to raise interest rates by somewhat less during the period of Federal Reserve tightening. While growth slowed in Malaysia in 1994, it still ranged from around 9 to 10 percent in 1994–96. The controls were apparently not intended to reduce the current account deficit, which grew from 4.6 percent of GDP in 1993 to a peak of 9.7 percent in 1995.

Second, controls could have limited Malaysia's external debt and financial vulnerability, reducing the likelihood or costs of current account reversal at least for a time. It appears that vulnerability was in fact reduced. Malaysia's overnight rate remained somewhat below the Federal funds rate (and was also much less volatile than the Thai short-term rate) after controls were lifted and despite the turbulence that followed the collapse of the Mexican peso. A number of indicators suggest that controls may have helped reduce vulnerability. First, capital controls were associated with a leveling off in portfolio inflows. Second, Malaysia's external vulnerability indicators were better than its neighbors along several dimensions around 1995: (a) the debt-to-exports ratio, which was already lower than in neighboring countries because of Malaysia's policy of regulating external debt, fell by around 9 percentage points to 46.4 percent between 1993 and 1995; (b) foreign reserve cover was higher than in other Southeast Asian economies and (c) currency mismatch indicators were much better in Malaysia than in some of its neighbors in 1996, on the eve of the Asian crisis. However, while the ratio of domestic bank credit to the private sector to GDP fell (from 108 in 1992 to 106 in 1993), it increased again after capital controls were imposed in early 1994 (figure 3).

Three points may be made here. First, Malaysia's approach around this time appears to be broadly consistent with a strategy of reducing external vulnerability while maintaining high growth rates. Second, while in hindsight it would have been desirable to tighten policy by more, this was not necessarily obvious at the time given relatively low external vulnerability, rapid growth rates, and Singapore's history of sustaining large current account deficits for an extended period. Third, the various preventive measures—namely, restrictions on external debt, temporary capital controls, and reserve accumulation—were ultimately not sufficient to prevent a crisis. Because of its better balance sheet position, Malaysia was able to weather the 1997–98

Asian crisis without IMF support. However, the decline in output in 1998 was still very large. This and speculative pressures in the aftermath of the Russian crisis led to the imposition of capital controls in September 1998.⁵²

4. CONCLUSIONS

This description of Southeast Asia's experience with current account deficits illustrates how high growth rates can be associated with significant external and domestic vulnerabilities. Rapid growth was linked to high rates of investment spending, which drove the current account cycle. It was also associated with increasing financial fragility, as suggested by rising credit-to-GDP ratios, high external debt exposure (particularly in short-term instruments), and currency mismatches.

Awareness of these vulnerabilities was incomplete, especially with regard to the extent of short-term debt exposure and currency mismatches. Also, the push for growth apparently restricted the range of policy responses. Policymakers sought to reduce current account deficits by encouraging more saving, but this was difficult to achieve in some of the countries discussed in this paper because saving rates were already high. Until the eve of the crisis, there appeared to be little desire to curb investment spending or to tighten fiscal policies that were generally considered sound or improving. The scope for monetary tightening was limited by efforts to stabilize currencies against the U.S. dollar, which was broadly consistent with a rapid-growth strategy during periods of dollar weakness against the yen. Monetary conditions did not tighten significantly until 1995. Real effective exchange rates did not appreciate until the mid-1990s, and they do not appear to have played a significant role in explaining large current account deficits up to that time. This conclusion is reinforced by research indicating that the impact of the exchange rate on current accounts or trade is weak in Southeast Asia. Nevertheless, sharp exchange rate appreciation

52. Capital controls imposed in September 1998 were also intended to give policymakers the leeway to boost growth, as well as to interrupt speculative pressures against the ringgit. By that time, however, Malaysia's current account had switched to surplus, so I do not focus on this episode here. The episode illustrates that even economies with relatively strong balance sheet positions can experience significant speculative pressures. These controls are discussed extensively elsewhere; see for example, Bank Negara Malaysia (1999), Cheong (2002), Edison and Reinhart (2002), Tamirisa (2004), and Kaplan and Rodrik (2002).

after the mid-1990s appears to have contributed to weaker exports and adverse shifts in market sentiment.

Policymakers occasionally used controls as a device to reduce vulnerabilities, to insulate their economies from market volatility, and to gain monetary independence. In Malaysia prior to the crisis, these measures appear to have reduced external vulnerability, although the imposition of capital controls in 1994 was not subsequently associated with a significant reduction in either growth or current account deficits.

The behavior of macroeconomic indicators since 1997–98 suggests that one of the primary lessons Southeast Asian economies took from the crisis is a strong desire to reduce vulnerabilities. Some policymakers now see a large current account deficit as a sign of possible excess, particularly when accompanied by evidence of other imbalances, such as rapid credit growth and very high, and possibly unsustainable, rates of investment and growth. Emphasis is increasingly placed on reducing external vulnerabilities. In line with this interpretation, growth rates have been much lower, on average, in the 2000s than they were in the first half of the 1990s. Current accounts have been in surplus for most of the period since the Asian crisis. In the case of Malaysia, they have increased sharply and are beginning to resemble the rising current account pattern observed in Singapore. Investment spending has only gradually recovered. Credit-to-GDP ratios remain well below the peaks observed in 1997–98. Foreign reserves now exceed the thresholds suggested by some conventional rules of thumb.

APPENDIX
Macroeconomic Indicators

Table A1. Macroeconomic Indicators for Southeast Asia, 1990–2005

<i>Indicator</i>	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Real GDP^a																
Indonesia	7.2	7.0	6.5	6.8	7.5	8.2	7.8	4.7	-13.1	0.8	5.4	3.6	4.5	4.8	5.1	5.6
Malaysia	9.0	9.5	8.9	9.9	9.2	9.8	10.0	7.3	-7.4	6.1	8.9	0.3	4.4	5.5	7.2	5.2
Philippines	3.0	-0.6	0.3	2.1	4.4	4.7	5.8	5.2	-0.6	3.4	6.0	1.8	4.4	4.9	6.2	5.0
Singapore	9.2	6.6	6.3	11.7	11.6	8.1	7.8	8.3	-1.4	7.2	10.0	-2.3	4.0	2.9	8.7	6.4
Thailand	11.6	8.1	8.1	8.3	9.0	9.2	5.9	-1.4	-10.5	4.4	4.8	2.2	5.3	7.0	6.2	4.5
Consumer prices^a																
Indonesia	7.8	9.4	7.5	9.7	8.5	9.4	7.0	6.2	58.0	20.7	3.8	11.5	11.8	6.8	6.1	10.5
Malaysia	3.0	4.4	4.8	3.6	3.7	3.5	3.5	2.6	5.1	2.8	1.6	1.4	1.8	1.1	1.4	3.0
Philippines	13.2	18.4	8.9	7.6	9.0	8.5	9.1	5.9	9.7	6.4	4.0	6.8	2.9	3.5	6.0	7.6
Singapore	3.5	3.4	2.3	2.3	3.1	1.7	1.4	2.0	-0.3	0.0	1.3	1.0	-0.4	0.5	1.7	0.5
Thailand	5.9	5.7	4.2	3.3	5.1	5.8	5.9	5.6	8.1	0.3	1.6	1.7	0.6	1.8	2.8	4.5
Government financial balance^b																
Indonesia	1.1	-0.6	-0.8	-0.5	0.3	0.8	0.8	-0.4	-1.9	-2.1	-1.5	-2.4	-0.9	-1.8	-1.3	-0.5
Malaysia	3.8	4.3	4.8	5.5	7.4	6.5	5.7	7.5	4.3	4.0	1.5	4.7	4.1	4.4	1.8	1.7
Philippines	-3.5	-2.1	-1.2	-1.5	1.0	0.6	0.3	0.1	-1.9	-3.8	-4.0	-4.0	-5.3	-4.6	-3.8	-2.7
Singapore	n.a.	9.4	12.5	15.4	11.4	12.4	16.3	9.0	6.5	4.1	8.5	4.7	4.3	6.5	5.6	6.9
Thailand	4.9	4.3	2.6	1.9	2.7	3.0	0.9	-1.5	-2.8	-3.3	-2.2	-2.4	-1.4	0.4	0.1	-0.6

Table A1. (continued)

Indicator	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Government debt ^b																
Indonesia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	15.2	24.7	44.6	75.8	91.8	78.2	69.4	60.3	55.4	46.3
Malaysia	79.5	73.3	64.4	55.7	47.6	41.1	35.3	31.9	36.4	37.3	36.6	43.6	45.6	47.8	48.1	46.2
Philippines	55.9	54.0	64.4	76.4	63.9	60.8	53.2	55.7	56.1	59.6	64.6	65.7	71.0	77.7	78.5	71.8
Singapore	77.0	79.2	83.0	74.3	69.8	72.4	72.7	71.9	83.5	89.8	84.1	97.1	99.0	104.8	102.7	102.9
Thailand	17.0	13.0	10.6	8.4	6.1	4.6	3.8	5.4	12.7	21.2	23.3	24.8	31.0	27.6	27.8	26.0
External debt/exports ^c																
Indonesia	272.1	269.3	266.0	242.2	269.2	273.9	258.8	241.9	300.3	295.1	220.8	233.7	223.5	213.6	194.9	n.a.
Malaysia	52.1	49.7	49.2	55.5	51.6	46.4	50.7	60.0	57.9	49.5	42.6	51.2	51.7	48.2	41.4	n.a.
Philippines	379.0	370.6	340.7	325.9	302.6	225.0	215.5	198.2	179.7	169.2	153.7	185.7	173.5	177.7	157.6	
Singapore	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Thailand	121.8	132.6	128.7	143.1	144.8	177.2	202.5	190.7	192.7	165.7	115.4	103.4	87.2	64.5	52.7	n.a.
Terms of trade ^a																
Indonesia	5.6	-2.9	-2.4	0.2	-1.7	-0.1	0.5	5.2	-14.9	31.8	-7.8	3.1	-3.3	-8.0	-3.6	-0.2
Malaysia	1.0	0.8	-0.2	0.2	-0.0	0.8	0.0	1.0	-0.9	-0.9	2.1	-1.2	-0.3	1.0	2.0	0.4
Philippines	0.5	2.9	2.1	1.2	3.1	-0.9	-1.2	0.3	1.3	-2.6	-3.2	0.9	1.1	-3.5	-5.0	-5.0
Singapore	n.a.	n.a.	-1.3	0.0	-3.3	-1.6	-0.3	-2.6	-0.2	-0.8	-2.9	-4.5	-5.2	-4.3	-1.5	-2.8
Thailand	-2.7	-1.2	0.9	-0.3	2.3	-0.9	-2.3	1.4	-3.8	0.8	-8.1	-7.1	2.0	4.3	-1.0	-5.1

Source: IMF; CEIC Data; World Bank, Global Development Finance; Datastream; Institute for International Finance; national data.

a. Annual change, in percent.

b. As a percentage of GDP; refers to central government.

c. In percent

n.a.: Not available.

REFERENCES

- Allayannis G., G.W. Brown, and L.F. Klaper. 2000. "Exchange Rate Risk Management: Evidence from East Asia." Policy research working paper 2606. Washington: World Bank.
- Ando, M. and F. Kimura. 2003. "The Formation of International Production and Distribution Networks in East Asia." Working paper 10167. Cambridge, Mass.: National Bureau of Economic Research.
- Bank Indonesia. Various issues (1990–97). *Report for the Financial Year*. Jakarta.
- Bank Negara Malaysia. 1999. *The Central Bank and the Financial System in Malaysia: A Decade of Change 1989–1999*. Kuala Lumpur.
- . Various issues (1990–97). *Annual Report*. Kuala Lumpur.
- Bank of Thailand. Various issues (1990–97). *Annual Economic Report*. Bangkok.
- Banque Paribas. 1995. "Asian Responses to External and Internal Stimuli." *Conjoncture*. Paris.
- Bautista, R. 2002. "Exchange Rate Policy in Philippine Development." Manila: Philippine Institute for Development Studies.
- Bayoumi, T. 1996. "International Trade and Real Exchange Rates." In *Exchange Rate Movements and Their Impact on Trade and Investment in the APEC Region*, edited by T. Ito, P. Isard, S. Symansky, and T. Bayoumi. Occasional paper 145. Washington: International Monetary Fund.
- BIS (Bank for International Settlements). 1996. *Annual Report*. Basel.
- Bongini, P., S. Claessens, and G. Ferri. 2001. "The Political Economy of Distress in East Asian Financial Institutions." *Journal of Financial Services Research* 19(1): 5–25.
- Bussière, M. and M. Fratzscher. 2006. "Towards a New Early Warning System of Financial Crises." *Journal of International Money and Finance* 25(6): 953–73.
- Calderón, C.A., A. Chong, and N. Loayza. 2002. "Determinants of Current Account Deficits in Developing Countries." *Contributions to Macroeconomics* 2(1): article 2.
- Calvo, G. and C. Végh. 1999. "Inflation Stabilization and BOP Crises in Developing Countries." In *Handbook of Macroeconomics*, vol. 1C, edited by J. B. Taylor and M. Woodford, 1531–14. Amsterdam: Elsevier Science, North-Holland.

- Chayawadee, C. and U. Jantarangs. 2004. "Thailand's Current Account Adjustment: Development and Responses to Economic Tools." Discussion paper DP/07/2004. Bangkok: Bank of Thailand.
- Cheong, L.M. 2002. "Capital Flows and Capital Controls: The Malaysian Experience." In *Globalization and the Asia Pacific Economy*, edited by K. T. Lee, 135–53. London: Routledge.
- Chinn, M.D. 1998. "Before the Fall: Were East Asian Currencies Overvalued?" Working paper 6491. Cambridge, Mass.: National Bureau of Economic Research.
- Corbo, V. and L. Hernández. 1996. "Macroeconomic Adjustment to Capital Inflows: Lessons from Recent Latin American and East Asian Experience." *World Bank Research Observer* 11(1): 61–85.
- Corsetti, G., P. Pesenti, and N. Roubini. 1999. "What Caused the Asian Currency and Financial Crisis?" *Japan and the World Economy* 11: 305–73.
- Dadush, U. and M. Brahmabhatt. 1995. "Anticipating Capital Flow Reversals." *Finance and Development* 31(4): 3–5.
- Dooley, M., D. Folkerts-Landau, and P. Garber. 2004. "The Revised Bretton Woods System." *International Journal of Finance and Economics* 9(4): 307–13.
- Drine, I. and C. Rault. 2004. "Does the Balassa-Samuelson Hypothesis Hold for Asian Countries? An Empirical Investigation." *Applied Econometrics and International Development* 4(4): 59–82.
- Edison, H. and C. Reinhart. 2002. "Capital Controls during Financial Crises: The Cases of Malaysia and Thailand." In *Financial Crises in Emerging Markets*, edited by R. Glick, R. Moreno, and M. Spiegel, 427–55. Cambridge University Press.
- Frankel, J. and A. Rose. 1996. "Currency Crashes in Emerging Markets: Empirical Indicators." *Journal of International Economics* 41(3–4): 351–66.
- Frankel, J. and S. Wei. 1994. "Yen Bloc or Dollar Bloc? East Asian Exchange Rate Policies." In *Macroeconomic Linkage*, edited by T. Ito and A. Krueger, 295–329. University of Chicago Press for National Bureau of Economic Research.
- García-Herrero, A. and T. Koivu. 2007. "Can the Chinese Trade Surplus Be Reduced with Exchange Rate Policy?" Paper presented at the 2007 Pacific Rim Conference. Guanghua School of Management and Western Economic Association, Beijing, China, 12–14 January.

- Ghosh, A.R., T.D. Lane, M. Schulze-Ghattas, A. Bulir, A.J. Hamann, and A. Mourmouras. 2002. "IMF-Supported Programs in Capital Account Crises." Occasional paper 210. Washington: International Monetary Fund.
- Glick, R. 1999. "Thoughts on the Origins of the Asia Crisis: Impulses and Propagation Mechanisms." In *The Asian Financial Crisis: Origins, Implications, and Solutions*, edited by W. Hunter, G. Kaufman, and T. Krueger. Norwell, Mass.: Kluwer Academic Publishers.
- Glick, R. and R. Moreno. 1994. "Capital Flows and Monetary Policy in East Asia." Pacific Basin working paper 94-08. Federal Reserve Bank of San Francisco.
- . 1995. "Responses to Capital Inflows in Malaysia and Thailand." Weekly letter 95-14. Federal Reserve Bank of San Francisco.
- Goldberg, L. and M. Klein. 1998. "Foreign Direct Investment, Trade, and Real Exchange Rate Linkages in Developing Countries." In *Managing Capital Flows and Exchange Rates: Perspectives from the Pacific Basin*, edited by R. Glick. Cambridge University Press and Federal Reserve Bank of San Francisco.
- Goldman Sachs. 1997. *Asia Economic Quarterly* (May).
- Goldstein, M. and P. Turner. 2004. *Controlling Currency Mismatches in Emerging Markets*. Washington: Institute for International Economics.
- Greene, J.E. 2002. "The Output Decline in Asian Crisis Countries: Investment Aspects." Working paper WP 02/25. Washington: International Monetary Fund.
- Guidotti, P., F. Sturzenegger, and A. Villar. 2004. "On the Consequences of Sudden Stops." *Economía* 4(2): 171-214.
- Hernández, L. and P.J. Montiel. 2003. "Post-Crisis Exchange Rate Policy in Five Asian Countries: Filling in the 'Hollow Middle'?" *Journal of the Japanese and International Economies* 17(3): 336-69
- Independent Evaluation Office. 2003. "The IMF and Recent Capital Account Crises: Indonesia, Korea, Brazil." Washington: International Monetary Fund.
- Johnson, S., P. Boone, A. Breach, and E. Friedman. 2000. "Corporate Governance in the Asian Financial Crisis." *Journal of Financial Economics* 58(1-2): 141-86.
- Kaminsky, G. and C. Reinhart. 1999. "The Twin Crises: The Causes of Banking and Balance of Payments Problems." *American Economic Review* 89(3): 473-500.

- Kaplan, E. and D. Rodrik. 2002. "Did the Malaysian Capital Controls Work?" In *Preventing Currency Crises in Emerging Markets*, edited by S. Edwards and J. Frankel. University of Chicago Press for National Bureau of Economic Research.
- Koh, W.T.H., R.S. Mariano, A. Pavlov, S.Y. Phang, A.H.H. Tan, and S.M. Wachter. 2005. "Bank Lending and Real Estate in Asia: Market Optimism and Asset Bubbles." *Journal of Asian Economics* 15(6): 1103–18.
- Levchenko, A. and P. Mauro. 2006. "Do Some Forms of Financial Flows Help Protect from Sudden Stops?" Working paper WP/06/202. Washington: International Monetary Fund.
- Marquez, J. 2002. *Estimating Trade Elasticities*. Dordrech: Kluwer Academic Publishers.
- Milesi-Ferretti, G.M. and A. Razin. 1996. "Current Account Sustainability: Selected East Asian and Latin American Experiences." Working paper 5791. Cambridge, Mass.: National Bureau of Economic Research.
- Monetary Authority of Singapore. 1997. "Current Account Deficits in the ASEAN-3." Occasional paper 1.
- . 2000. "Exchange Rate Policy in East Asia after the Fall: How Much Have Things Changed?" Occasional paper 19.
- Moreno, R. 1997. "Lessons from Thailand." *FRBSF Economic Letter* (7 November). Federal Reserve Bank of San Francisco.
- Ostry, J.D. 1997. "Current Account Imbalances in ASEAN Countries: Are They a Problem?" Working paper WP/97/51. Washington: International Monetary Fund.
- Pootrakool, K., K. Ariyaprichya, and T. Sodsrichai. 2005. "Long-Term Saving in Thailand: Are We Saving Enough and What Are the Risks?" Bank of Thailand Economic Symposium, 2005. Bangkok, 17–18 August.
- Rajan, R. and L. Zingales. 1998. "Which Capitalism? Lessons from the East Asian Crisis." *Journal of Applied Corporate Finance* 11(3): 40–48.
- Roong, P.M., Y. Thaicharoen, and D. Rodpingsangkaha. 2003. "Investment Cycles, Economics Recovery, and Monetary Policy." Discussion paper DP/07/2003. Bangkok: Bank of Thailand.
- Sachs, J. and S. Radelet. 1998. "The East Asian Financial Crisis: Diagnosis, Remedies, Prospects." *Brookings Papers on Economic Activity* 1998(1): 1–74.
- Sachs, J.D., A. Tornell, and A. Velasco. 1996. "Financial Crises in Emerging Markets: The Lessons from 1995." *Brooking Papers on Economic Activity* 1996(1): 147–215.

- Sarel, M. 1997. "Growth and productivity in ASEAN countries." Working paper 97/97. Washington: International Monetary Fund.
- Stiglitz, J.E. 1996. "Some Lessons from the East Asian Miracle." *World Bank Research Observer* 11(2): 151–77.
- Tamirisa, N. 2004. "Do Macroeconomic Effects of Capital Controls Vary by Their Type? Evidence from Malaysia." Working paper 04/3. Washington: International Monetary Fund.
- Union Bank of Switzerland. 1995a. "Currencies." Zürich.
- . 1995b. "Indonesia: No Policy Ease in Sight." Country report. Zürich.
- . 1995c. "Thailand." Country report. Zürich.
- . 1996. "Indonesia." Country report. Zürich.
- Van't Dack, J. 1999. "Implementing Monetary Policy in Emerging Market Economies: An Overview of Issues." Policy paper 5. Basel Bank for International Settlements.
- Vargas-Silva, C. and P. Huang. 2006. "Remittances: Host versus Home Country's Economic Conditions." *Journal of International Trade and Economic Development* 15(1): 81–99.