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Marcus Cieleback\*

# The Economic and Currency Crisis in South-East Asia

## Was it Really so Unexpected?

*When a series of Asian countries got into a serious economic crisis in the middle of last year, it took most observers by surprise. Current models for the explanation of currency crises are indeed inadequate in this instance.*

*Do we need a new theory, or can existing models be expanded to enable us to explain and predict events such as those in Asia?*

On 2nd July last year the government of Thailand was forced to float the country's currency, the baht. All efforts and protestations to keep the exchange rate stable against the US dollar had failed. The floating of the baht initiated a spiral of devaluations in South-East Asia, in the course of which more and more currencies came under pressure. This brought to an abrupt end a phase of relatively stable exchange rates against the dollar, which had lasted for a good 10 years. In the meantime, many of the South-East Asian currencies have lost over 60% of their value against the dollar (see Table 1 for a chronology of the most important events).

How could such major devaluations come about? After all, the Asian countries and their style of economic policies were held up as a model for many newly industrializing and developing nations. Countries such as South Korea, Thailand, Malaysia and China were seen as the future challengers of the leading industrial nations. On the other hand, few heeded Krugman's objection that the phenomenal growth of the tiger economies was almost exclusively due to an increase in the inputs of labour and capital and would hence inevitably have to decline.<sup>1</sup> Why did so many underestimate the risk in South-East Asia? Were there no indications of a crisis?

This article first of all sets out the reasons why the crisis came so unexpectedly for many observers. In doing so, it looks at the present models available to explain currency crises. It goes on to show to what

extent there were, nevertheless, indications of impending problems. These indicators prove to lie outside the current models for explaining currency crises, which may be why they were so little heeded. The existence of these indicators, however, does not necessarily mean that a serious crisis, such as in Asia at present, can be precisely predicted.

### A Fast Process of Development

It is possible that the currency crisis came as such a surprise to many observers largely because the tiger countries had hitherto been known for their exceptionally positive economic development. The governments had policies in operation that succeeded in creating a favourable macroeconomic environment.

In the period from 1990 the East Asian countries achieved average real growth rates of between 6% and 7% annually. In the last few years none of the countries had been running any appreciable government deficit. The budget deficits which some countries still had at the start of the 1990s were steadily reduced, and indeed were transformed into considerable surpluses in some cases. Alongside this, inflation rates were held at a low level for countries at their stage of development. In almost all of the countries now hit by the crisis the inflation rates since 1990 had been in single figures. These Asian nations were able to keep their exchange rates against the US dollar relatively stable, in spite of external shocks such as the devaluation of the Chinese yuan in 1994

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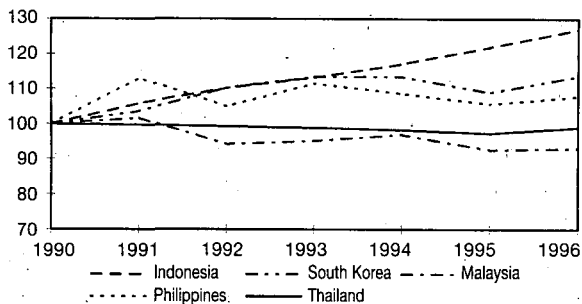
<sup>1</sup> Paul Krugman: The Myth of Asia's Miracle, in: Foreign Affairs, Vol. 73 (1994), No. 6, pp. 62-78.

## Chronology of the Asian Crisis (1997)

- |                |  |
|----------------|--|
| January        | Hanbo Steel goes bankrupt. This South Korean company was carrying debts of over US \$ 6 billion. First bankruptcy of a major corporation for more than 10 years.   |
| 5th February   | Somprasong Land is the first Thai company to be unable to service its foreign debt.  |
| March          | Sammi Steel of South Korea collapses.  |
| 10th March     | The government of Thailand promises it will purchase \$3.9 billion-worth of bad property loans, but subsequently fails to honour its promise. Michel Camdessus (Director General of the IMF) declares, "I don't see any reason for the crisis to develop further." |
| 28th March     | The Malaysian central bank imposes restrictions on lending to purchasers of property and securities in a bid to stave off a crisis.  |
| 14th/15th May  | The Thai baht is targeted by a speculative attack for the first time. Thailand and Singapore intervene to defend the baht.   |
| 23rd May       | The rescue package for Thailand's largest financial institution, Finance One, is a failure.  |
| 18th June      | Thailand's Minister of Finance Viravan resigns. Prime Minister Yongchaiyudh states, "We will never devalue the baht."<br>The overnight interest rate in the Philippines increases to 15%.  |
| 27th June      | Thailand's central bank closes down 16 banking organizations that are suffering liquidity problems.  |
| July           | Kia, South Korea's 3rd largest car manufacturer, runs into difficulties due to bad loans, and asks for credit assistance.  |
| 2nd July       | Thailand releases the baht from its US-dollar peg.   |
| 11th July      | The Indonesian rupiah comes under pressure. Trading band widened from 8% to 15%.   |
| 14th July      | Malaysia stops supporting the ringgit.   |
| 17th July      | The Singapore Monetary Authority allows the Singapore dollar to reach its lowest level since February 1995.  |
| 28th July      | Thailand requests help from the IMF.   |
| 11th August    | The IMF presents its rescue plan for Thailand. The country is to receive loans from the IMF and other Asian countries worth over \$16 billion.   |
| 14th August    | The Indonesian rupiah is taken off its dollar peg.   |
| 15th August    | First speculative attack on the Hong Kong dollar.<br>The overnight interest rate goes up 150 basis points to 8%.   |
| 23rd August    | George Soros comes under fire from Malaysia's Prime Minister Mahathir: "All these countries have spent 40 years trying to build up their economy and a moron like Soros comes along."  |
| 27th August    | The Malaysian government restricts share dealing.  |
| 3rd September  | The Indonesian rupiah under renewed pressure. The government promises banking reform and calls a halt to government spending.  |
| 5th September  | Restrictions on share dealing in Malaysia are almost completely lifted again.  |
| 20th September | Dr. Mahathir addresses the delegates at the IMF/World Bank annual meeting in Hong Kong. He denounces currency dealing as immoral and calls for a ban.  |
| 21st September | Soros: "Dr. Mahathir is a menace to his own country."  |
| October        | The South Korean state takes over Kia after banks refuse to lend any more money.   |
| 8th October    | The Indonesian government asks the IMF, World Bank and Asian Development Bank for help.  |
| 20th October   | Thailand's Minister of Finance Thanong Bidaya resigns.   |
| 22nd October   | The overnight interest rate in Hong Kong rises from 8% to almost 300%.   |
| 1st November   | The Indonesian government shuts down 16 troubled financial institutions.   |
| 3rd November   | Sanyo Securities, Japan's seventh largest securities broker, is the first to go bankrupt since 1945.   |
| 4th November   | Thailand's Premier Chavalit resigns.   |
| 21st November  | South Korea asks for immediate aid of \$20 billion from the IMF.   |
| 8th December   | 56 out of 58 Thai banks close once and for all. 6,000 employees lose their jobs.   |
| 15th December  | The South Korean won is allowed to float.  |
| 22nd December  | Moody's rating agency places Indonesian debt on a par with junk bonds.   |

Sources: Financial Times, Der Spiegel, CNNfn.

**Figure 1**  
**The Nominal US-dollar Exchange Rate of Selected Asian Countries' Currencies**  
 (1990 = 100, annual averages)



Sources: IMF; own calculations.

(see Figure 1). Although only a few countries pegged their currency directly to the dollar, the importance of the dollar in the basket of currencies was nevertheless mostly so great that they did operate a dollar peg to all intents and purposes.

These countries' very high average propensity to save and invest is also worthy of note. Savings as high as 30% of GDP and investment propensities above that were not uncommon (Table 1). Considerable resources were also invested in human capital. The proportion of illiteracy and of children with no school education declined steadily.

A further fundamental factor is the degree of openness of these economies. That openness did not stop at strong export growth (even if this was partly achieved by aggressive export promotion). It also led to a continuous reduction in the number of import impediments, although considerable barriers did remain in some areas, in the financial sector in particular. Altogether it is clear that the Asian countries experienced an unusually rapid process of development. They appeared to have done all the right things to keep themselves on track for continuing successful economic development in the next few years.

### Models to Explain Currency Crises

The models for explaining currency crises which were developed at the end of the 1970s and the start of the 1980s, the so-called "first-generation models", see the cause of currency turbulence in monetary policy which is incompatible with a fixed exchange rate, e.g. as a result of a government's expansionary, credit-financed fiscal policy,<sup>2</sup> which is monetarized by a central bank lacking sufficient independence. At the

**Table 1**  
**Average Propensities to Save and Invest**  
 (% of GDP)

	1990	1992	1994	1996
Indonesia				
Saving	27.9	27.3	29.2	28.8
Investment	28.3	25.8	27.6	28.1
Malaysia				
Saving	29.1	31.3	32.7	36.7
Investment	32.4	36.0	40.1	42.2
Philippines				
Saving	18.7	19.5	19.4	19.7
Investment	24.0	20.9	23.6	23.2
South Korea				
Saving	36.1	35.1	34.6	33.3
Investment	37.1	36.6	35.7	36.8
Thailand				
Saving	32.6	34.3	34.9	33.1
Investment	40.2	39.2	39.9	40.8

Source: IMF.

same time the central bank is committed to supporting the country's currency and selling convertible currency at the fixed rate. Should the convertible currency reserves drop below a critical level, traders will start a speculative attack on the currency. This attack will lead to the central bank's currency reserves being used up. With no more reserves in the war chest, the fixed exchange rate can no longer be defended and the position has to be abandoned.

Looking at the situation in the Asian countries against this background, clearly neither the budget situation nor what was happening to convertible currency reserves gave any indication of the problems that were to come. Thailand's reserves (not counting gold) grew by between 16% and 39% in the period from 1990 to 1995. In 1996 the convertible currency reserves had reached a volume of more than \$37 billion. In the same period of time the government's budget surplus varied from 1.9% to 4.7% of GDP (Table 2).

Similar developments can be observed in the other Asian countries. In Indonesia, for example, the budget surplus in 1995 was 2.2% of GDP, and the currency reserves (excluding gold) grew by 144% between 1990 and 1996. Only South Korea recorded a budget deficit in 1996, which, as it only constituted 0.07% of the GDP, can be disregarded according to the first-

<sup>2</sup> Paul Krugman: A Model of Balance-of-Payments Crisis, in: Journal of Money Credit and Banking, Vol. 11 (1979), pp. 311-325; Robert Flood, Peter Garber: Collapsing Exchange-Rate Regimes: Some Linear Examples, in: Journal of International Economics, Vol. 17 (1984), pp. 1-13.

generation models. Also, its currency reserves grew between 1990 and 1996 by 130% to around \$34 billion (Table 2).

The "first-generation" models did not give rise to any expectation of a crisis in Asia. However, these models did have a number of serious limitations. Only in the rarest of cases does a government act as mechanically as the models assume. Moreover, a central bank has various instruments at its disposal which it can use to stabilise an exchange rate. Lahiri and Végh show, for example, that a currency crisis as described by the first-generation models can be prevented by pursuing an appropriate interest-rate policy.<sup>3</sup>

**Table 2**  
**Convertible Currency Reserves (US\$ million)**  
**and the Budget Surplus/Deficit**  
(% of GDP)

	1990	1991	1992	1993	1994	1995	1996
<b>Indonesia</b>							
Currency reserves	7.459	9.258	10.449	11.263	2.133	13.708	18.251
Budget position	0.41	0.43	-0.42	0.61	0.94	2.23	1.17
<b>South Korea</b>							
Currency reserves	14.793	13.701	17.121	20.228	25.639	32.678	34.037
Budget position	-0.67	-1.62	-0.49	0.64	0.32	0.29	-0.07
<b>Thailand</b>							
Currency reserves	13.305	17.517	20.359	24.473	29.332	35.982	37.731
Budget position	4.53	4.70	2.83	2.09	1.87	3.00	
<b>Mexico</b>							
Currency reserves	12.464	5.279	6.329	9.863	17.726	18.942	25.110
Budget position	-14.22	-9.61	-4.99	-2.80	-0.23	1.54	0.33

Sources: IMF; own calculations.

**Table 3**  
**Unemployment and GDP Growth Rates**

	1990	1991	1992	1993	1994	1995	1996
<b>Indonesia</b>							
Unemployment rate	2.5	2.6	2.7	2.7	4.4		
Growth rate	7.2	7.0	6.5	6.5	7.5	8.2	7.8
<b>South Korea</b>							
Unemployment rate	2.4	2.3	2.4	2.8	2.4	2.0	2.0
Growth rate	9.5	9.1	5.1	5.8	8.6	8.9	7.1
<b>Thailand</b>							
Unemployment rate	2.2	3.5	3.6	1.5			
Growth rate	11.6	8.4	7.8	8.3	8.8	8.7	
<b>Mexico</b>							
Unemployment rate	3.9	3.6	3	2.8	2.6	2.8	3.4
Growth rate	1.8	1.3	4.1	5.1	4.2	3.6	2.0

Sources: IMF; OECD; own calculations.

In this context it is interesting to note that a similar picture emerges for the convertible currency reserves and the net budget position in Mexico in the run-up to the currency crisis of 1994. Then too currency reserves (excluding gold) had risen by over 100% in the 7 years prior to the crisis despite a reversal between 1987 and 1988. At the same time the public-sector budget improved considerably: a deficit of 14.2% of GDP in 1987 had been reduced to only 0.7% of GDP in 1994, with even a small surplus recorded in 1992 and 1993 (Table 2).

The crises in the ERM I (1992/93) and in Latin America (Mexico 1994) led to the development of the so-called "second-generation" models in the early 1990s. The analysis centres around a government which, in trying to decide whether to keep or to abandon a fixed exchange rate, sees itself faced with conflicting interests. The conflict arises when the government has to refrain from changing the exchange rate – which might, for example, help it to combat unemployment in the short term – for the sake of establishing its long-term credibility as a government committed to the exchange rate, or *vice versa*.<sup>4</sup> Defending the fixed exchange rate will be costly for a government if market players recognize the dilemma it faces and believe that the exchange rate cannot be upheld in the long term. In the models the government's dilemma is referred to as a minimization problem. In any particular period the government will try to minimize a function of welfare loss, whose value depends on macroeconomic parameters such as unemployment and growth, as well as the costs of abandoning the fixed exchange rate.

Can we, by using these models, find indicators which could have warned us of a crisis in Asia? The favourite place to start would be to look at economic policy objectives such as the growth rate, unemployment and the inflation rate. As pointed out earlier, the Asian countries had been growing at an average rate of 6-7%. Growth rates in Malaysia, South Korea and Thailand declined a little in 1996 (see Table 3). But since all these economies continued to grow faster than the average, it is safe to assume that the slight deceleration would not have tempted the governments concerned to abandon their currency pegs and to allow people to question the credibility of their policies.

<sup>3</sup> Amartya Lahiri and Carlos Végh: Krugman Balance of Payments Crises: Are they for real?, mimeo, 1997.

<sup>4</sup> Maurice Obstfeld: The logic of currency crisis, in: Cahiers Economiques et Monétaires 43, 1994, pp. 189-213.

Inflation rates in these countries gave little cause for alarm, and unemployment was not at the kind of level that would have made any government want to resort to drastic market intervention. Indeed except in the Philippines, the rate of unemployment lay between 1.5% and 4%. Even the average rate of 9.5% in the Philippines would not be expected to get policymakers into a flap when the economic growth rate of 4.5-5% is taken into account.<sup>5</sup>

Unemployment trends in Indonesia are probably the only factor that might normally have caused concern. After a gradual increase from 2.5% at the start of the decade to 2.8% in 1993, the rate of unemployment rose by 1.6 percentage points to 4.4% in 1994. Growth in Indonesia's GDP peaked at 8.2% in 1995, subsequently falling back slightly to 7.8% (see Table 3).

Here too, it is worth noting a degree of similarity between the present events in Asia and those in Mexico in the run-up to its currency crisis in December 1994. Mexican growth had slowed down somewhat in the three years before the crisis broke. Real growth in GDP, which had been above 5% in 1990, fell back to just 2% in 1993. As growth declined, the unemployment rate rose slightly from 2.6% in 1991 to 3.4% in 1993 (Table 3).

Overall, one can say that the predominant theories on how currency crises occur are hardly in a position, if at all, to assess the Asian situation. Neither the "first" nor the "second generation" models led us to expect a crisis there. The only aspect which might have given rise to concern was the size of the current account deficits many of the affected countries were running. During the 1990-1996 period, these deficits ranged from 2% to 8% of GDP.<sup>6</sup> Nevertheless, a number of studies have been undertaken that regarded the Malaysian deficit of up to 8% of GDP as

financeable in the long term. The tenor of these studies was that, in contrast to earlier experience in Latin America, the Asian countries were putting their deficits to more effective uses that ought not to cause problems.<sup>7</sup>

### Why a Crisis Could Have Been Expected

To begin with, persisting current account deficits of 5% of GDP and above are not sustainable in the long run, as the obligation to amortize the capital inflows reduces the room for manoeuvre. The flow of capital into a country running a large deficit tends to push up its real exchange rate, which in turn leads to expansion of the non-tradable goods sector. Even though the appreciation of the currency is only temporary (it is reversed when the borrowed capital is repaid in later periods), short-term expectations nevertheless draw investment money into the non-tradable sector, which includes real estate. A further problem was that the financial sector in most of the Asian countries was not sufficiently developed to channel these capital inflows into efficient uses. In such a situation, banks are inclined to accept lending business that is too risky (i.e. they do not sufficiently consider project risks). If the central bank tries to sterilize some of the capital inflows by intervening in the markets to relieve the upward pressure on the currency, the country's convertible currency reserves begin to swell as a result (see Table 2).

<sup>5</sup> At the time of the EMS crisis, unemployment rates in Europe were around the 10% mark, with real GDP just managing to grow at 1% per annum.

<sup>6</sup> Calculated with the aid of IMF: International Financial Statistics, various issues.

<sup>7</sup> Monetary Authority of Singapore: Current Account Deficits in the ASEAN-3, Is there a cause for concern?, Occasional Paper No. 1, Singapore 1997; Jonathan D. Ostry: Current Account Imbalances in ASEAN Countries: Are they a Problem?, IMF Working Paper 97/51, Washington D.C. 1997.

Hans-Joachim Koch/Rainer Lagoni (Eds.)

## The Reception of Oily Waste from Ships in European Ports

Report and Papers of a Congress organised by the State Ministry of the Environment of the Free and Hanseatic City of Hamburg, Hamburg, 4-5 March 1997

As the disposal of oily waste from ships affects the environment, the shipping-industry and the competition between ports, the interested parties discussed this contested issue at the international congress in order to find solutions that could provide a basis for an EC-Directive.

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Another key factor lies in the type of funds coming in to fund the country's current account deficit. Foreign direct investment is seen as a particularly beneficial form of capital inflow, as it is likely to boost exports or reduce imports. Another advantage of foreign direct investment is that the imported capital cannot be swiftly pulled back out of the country, risking a drain on currency reserves.

What proportion of the capital inflows funding the current account deficits was in fact taken up by foreign direct investment? The percentage share in different countries is shown in Table 4. This clearly shows that the proportion of deficit finance contributed by direct investment was steadily declining. By 1995, it accounted for 21.5% of the funding in South Korea, and just 15.3% in Thailand. In Malaysia, the drop is especially marked, from 239% of the deficit in 1992 to just 56% in 1995, even though direct investment still increased in absolute terms. This situation weakens the central bank's position if it is

**Table 4**  
**Proportion of Deficit Financing by Foreign Direct Investment**  
(% of Current Account Deficit)

	1990	1991	1992	1993	1994	1995
Indonesia	36.6	34.8	63.9	95.2	75.5	61.9
Malaysia	268.1	95.6	239.2	167.4	96.1	56.1
Philippines	19.7	52.6	22.8	41.1	53.9	74.7
South Korea	45.2	14.2	18.5	-	21.0	21.5
Thailand	33.6	26.6	33.5	28.4	16.9	15.3

Sources: IMF; own calculations.

**Table 5**  
**Indebtedness of Selected Asian Countries**  
(US\$ million)

	June 1994	Dec. 1994	June 1995	Dec. 1995	June 1996	Dec. 1996	June 1997
Total	129.453	148.941	180.167	201.655	226.842	247.857	260.360
Short-term	89.084	98.981	122.139	133.372	149.744	158.634	166.678

Sources: IMF; own calculations.

**Table 6**  
**Real Effective Exchange Rate Trends**

	1994	1994	1995	1995	1996	1996	1997
Indonesia	100	102.3	103.5	106.6	103.7	103.2	107.9
Malaysia	100	99.9	113.1	114.4	110.4	110.3	115.3
Philippines	100	111.7	116.0	105.5	120.9	118.6	125.7
South Korea	100	94.2	90.4	87.7	87.2	90.4	89.4
Thailand	100	96.9	97.6	99.7	96.2	99.5	104.9

Sources: JP Morgan; own calculations.

called upon to defend the value of the currency, and so the pressure on these countries to devalue built up steadily.

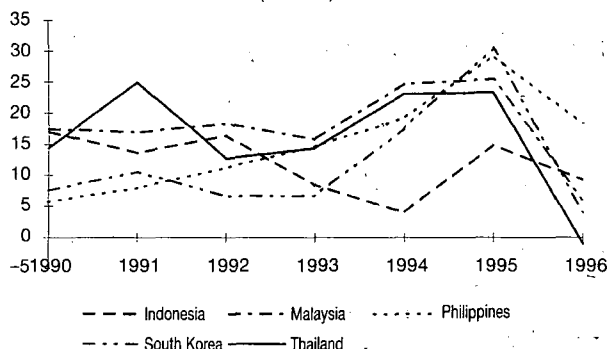
The next item to examine more closely is the average term of the foreign debt in the Asian countries. Table 5 shows both the level of foreign debt over time in Thailand, Malaysia, Indonesia, South Korea and the Philippines, and the proportion of it that was short-term (with up to one year to maturity).

More than half of the debt obligations in these countries have one year or less to run. Lenders have found it advantageous to keep terms short, as this reduces the risk of unexpected events occurring that might lead to default during the life of the loan (the risks include default for political reasons, insolvency on the part of the borrower or substantial changes in the exchange rate), so prospective profits for lenders were good. On the other hand, borrowers depended on being able to roll over their obligations into new loans, as the money had often been invested in long-term projects in the domestic economy (this is a classic mismatch of maturities, with inadequate maturity transformation in the banking system). Borrowers were therefore extremely dependent on market expectations. If lenders had suddenly ceased being willing to roll over the credit lines already provided, the borrowers would soon have faced liquidity problems. So the debt profile of the South-East Asian countries did offer signs of the difficulties they were in.<sup>8</sup> To make matters worse, the bulk of their debt was denominated in US dollars. Few of the borrowers had hedged their exchange risk, having assumed that their currencies would continue to be stable in relation to the dollar.

For most of the 1990s, the Asian countries' nominal dollar exchange rates were indeed relatively stable. The relative weight of the dollar in the currency baskets to which they were pegged meant that the real trade-weighted exchange rate of a number of the currencies appreciated quite strongly from 1995 onwards. This was a consequence of the dollar's nominal appreciation vis-à-vis the Japanese yen and the European currencies – a process which began in the spring of 1995. The real revaluation tended to undermine these countries' competitive situation on world markets. Exports grew more expensive relative to imports, so the trade balance and hence also the current account deteriorated. Data for 1996 indicate

<sup>8</sup> IIF: Capital Flows to Emerging Market Economies, 1998, pp. 11a f.; Morris Goldstein: The Asian Financial Crisis, Policy Brief 98-1, Institute for International Economics, 1998.

**Figure 2**  
**Export Growth Rates**  
 (nominal)



that a number of currencies were now overvalued relative to their position at the start of the 1990s. There appeared to be an urgent need for real devaluation. South Korea is one exception in this respect, as the won had already undergone real devaluation since the early 1990s.<sup>9</sup>

The impact of real currency appreciation is clear from trends in export earnings. All of the countries concerned suffered substantial growth setbacks in this area in 1996 after the dollar's international value had turned upward in 1995. Thailand's exports actually fell by 1%, and storm clouds were gathering for the other countries in the group, too (see Figure 2). However, one factor to bear in mind is that the fall-off in export growth was partly due to price erosion in semiconductor products.<sup>10</sup>

Property prices can be considered to have played a key role in the Asian crisis. Prices had gone up so much, for mainly speculative reasons, that it was only a matter of time before the bubble could be expected to burst. Shortly before the crisis broke, prices began to drop sharply in the real-estate sector, and that can be regarded as one of the triggers for the fall we have seen in the Asian currencies.<sup>11</sup> There are a number of similarities to Japan's situation in the early 1990s

(when real-estate values dropped and the stock market collapsed), the main difference being that the yen was not pegged to the dollar, which may have prevented a more serious currency crisis at that time. Indeed, the yen depreciated only slightly against the dollar, and did so only for a short period.

To sum up, there were a number of pointers suggesting that problems could occur in Asia. However, these indicators do not fall within the framework of the models for explaining currency crises that have so far appeared in economic literature.

### Conclusions

The crisis in East Asia cannot be described adequately, if at all, by conventional currency crisis models. This raises the question as to whether we need a thoroughly new theory or whether existing models could be extended to enable them to describe and explain the Asian situation.

Krugman has set out in 1998 along a road that could produce a third generation of currency crisis models.<sup>12</sup> He depicts the Asian crisis as a result of the boom-and-bust cycle in the property sector coupled with a moral hazard situation in the financial sector. Thus, in Krugman's view, the currency crisis is a result of a preceding crisis in the real-estate sector.

However, it is possible that second-generation models might be extendible to allow them to describe the situation in East Asia. The primary aim ought to be to develop multi-country models that could explain the contagious spread of a crisis from one economy to another. This is especially true of countries that do not trade a great deal with one another. These models also ought at least partly to be able to explain the contagion phenomenon in Latin America. However, another improvement needed is that they should take closer account of possible future events. Among the quantities that could be factored in are future budget deficits, such as those now expected to occur as a result of the government bail-outs for bankrupt financial institutions in the East Asian countries. Foreign debt and the term of that debt should also be more prominently considered.

At present, it is impossible to say which of these two approaches is the more promising. Which direction researchers are heading in will become clear during the next few months. Yet with or without more subtle models, there were a number of warning signs of a forthcoming crisis in Asia, but market participants paid them only scant attention at the time.

<sup>9</sup> Indeed, on the basis of IMF data Wyplosz concludes that the currencies of all the countries under discussion here appreciated strongly in real terms over the 1990-1997 period. The real revaluation is placed at 12% for South Korea, 25% for Indonesia and Thailand, 28% for Malaysia, and 47% for the Philippines. Charles Wyplosz: *Globalized Financial Markets and Financial Crisis*, mimeo, 1998, p. 8.

<sup>10</sup> IIF, *op. cit.*, p. 12a.

<sup>11</sup> Paul Krugman; *What happened to Asia*, mimeo 1998; Paul Krugman: *Bubble, Boom, Crash: Theoretical Notes on Asia's Crisis*, mimeo 1998.

<sup>12</sup> Paul Krugman; *What happened to Asia*, *op. cit.*; Paul Krugman: *Bubble, Boom, Crash*, *op. cit.*