

INSULATION OF INDIA FROM THE EAST ASIAN CRISIS: AN ANALYSIS

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This paper investigates the effects of the East Asian crisis on the Indian economy and exchange rate movements. Despite the contagion effects that profoundly affected the other crisis-hit countries, the Indian economy and the rupee were found less affected. Reforms after the 1990–1991 crisis, control of capital flows, weak economic linkages with crisis-affected countries and stabilization policies that include intervention in the foreign exchange market and tightening of monetary policy are reasons for the insulation of the Indian economy from the crisis.

Keywords: Contagion; currency pressure; liberalization and reforms; policy intervention.

1. Introduction

This paper examines the effects of the 1997 East Asian financial crisis on the Indian economy and exchange rate movements. It seeks to identify the reasons for the insulation of the Indian economy from the crisis. The main findings suggest that reforms undertaken in response to the domestic crisis in 1991 and the Mexican crisis in 1994–1995 as well as stabilization policies adopted during the crisis period helped to shield the Indian economy from most of the effects of the financial crisis in 1997.

The paper is organized as follows. Section 2 gives a brief background of the East Asian crisis and introduces the concept of contagion and its role in the crisis. The impact of the contagion effect on India is also discussed. Section 3 gives an overview of the Indian exchange rate system since the early 1990s. Reasons for the insulation of the Indian economy from the East Asian crisis are discussed in Section 4. Section 5 concludes.

2. The East Asian Crisis

The East Asian financial crisis of 1997–1998 came close on the heels of the Latin American crisis of 1994–1995. Both crises were triggered by the sudden collapse of major regional

currencies: the Mexican peso and the Thai baht. Prior to the crisis, several similarities between the two catalyst countries were identified. Both Mexico and Thailand had received large capital inflows and foreign investment in the 1990s and had been highly regarded by international investors. However, both had experienced deterioration in their export growth rates and rise in current account deficits in the years before the crises. The real exchange rate in Mexico and Thailand had also appreciated significantly. Overvalued exchange rates, speculative attacks and investor panic all led to currency depreciation.

There were, at the same time, significant differences between the two crises. Before the financial crisis of 1997, the model of development adopted by the East Asian economies was widely accepted as being extremely conducive for sustained economic growth over a long period. Unlike the Latin American countries, these economies were distinguished by their high rates of capital accumulation and savings, and strong cooperation between the state and the private sector. They experienced high growth rates, low rates of inflation and balanced government budgets. For example, the Thai economy had a budget surplus of 2.6% of GDP in the 1991 to 1996 period. Malaysia recorded an inflation rate of 4.2%, while Korea had a savings rate of 34.8% in the same period (Desai, 2003). In fact, as Radelet and Sachs (1998) argue, many of the usual macroeconomic indicators of any financial crisis did not register any significant changes for the East Asian economies. Thus, the crisis caught most of the global financial system.

It was, however, the factors that had made the East Asian economies such stellar successes, widely promoted by the IMF and the World Bank, which became the reasons for the financial crisis that was to follow. There was rapid capital accumulation, but it was mostly by highly leveraged industries in exports and real estate.

The most important warning sign of the impending crisis was the fragility of the financial system. Credit extended by the banks to the private sector expanded very rapidly, financed mostly by the banks' huge offshore borrowings. Financial sector claims on the private sector increased from 100% in 1990 to approximately 140% in Malaysia, Thailand and Korea. Programs of partial financial liberalization in the late 1980s and early 1990s had allowed the banks to channel foreign money into the domestic sector. For example, in Thailand, foreign liabilities of commercial banks increased from 5.9% to 28.4% of GDP between 1992 and 1995 (Radelet and Sachs, 1998). As the numbers in Table 1 show, the total international claims held by foreign banks increased from about US\$185 billion for Thailand, Korea and Indonesia in the end of 1995 to US\$231 billion in mid-1997. A large part of this bank credit was used by the private sector for real estate investment. Real estate loans ranged from 30% to 40% in Thailand and 15% to 25% in South Korea by late 1997 (Desai, 2003). Significant amounts of foreign capital were flowing into the real estate sector of the East Asian economies due to the abnormally high rates of return that were offered. For instance, in the mid-1990s, the annual return on building a skyscraper in Bangkok was close to 20%.

The problem of moral hazard afflicted much of the credit extended to the private sector. As the finance companies and banks borrowed heavily from abroad, they accumulated short-term unhedged liabilities and lent long-term to finance projects with questionable viability, and soon the borrowers missed repayments. These structural imperfections led to

Table 1. International Claims Held by Foreign Banks: Total Outstanding

Country	End 1995	End 1996	Mid-1997
Thailand	62.8	70.2	69.4
Indonesia	44.5	55.5	58.7
Malaysia	16.8	22.2	28.8
Philippines	8.3	13.3	14.1
Korea	77.5	100.0	103.4

Note: Figures are in US\$ billion.

Source: Bank for International Settlements.

distortions where the ratios of corporate debt-to-equity averaged 395% in South Korea and 450% in Thailand as the borrowing boom accelerated, compared to 106% in USA.

The large capital inflows created an investment boom in East Asia. Although the investment boom represented a significant positive shock to these economies, it contributed to asset price and widened their current account deficits at the same time.

The borrowing boom, therefore, was in several ways, the catalyst of the East Asian financial crisis. Although the economies had strong fundamentals, their financial excesses made them vulnerable to external shocks. Borrowing short-term, lending long-term, borrowing in dollars and yen and investing in assets which yielded returns in domestic currencies made them even more so. In 1995, the strengthening dollar (against the yen) led to an appreciation of the East Asian currencies that were quasi-fixed against the dollar. The appreciation and the weaker external demand since 1996 weakened their exports and threatened the stability of the domestic currencies. There were additional risks — banks in the debtor Asian five countries (Thailand, Indonesia, South Korea, Philippines and Malaysia) could not hedge their net holdings of short-term dollar liabilities in the pre-crisis period. Risk premiums in the domestic interest rates of debtor economies with original sin¹ were also higher than on dollar assets of comparable maturity. Therefore, the banks tended to overborrow in dollars without covering for exchange rate risk. When a speculative currency attack occurred in this situation, it forced an immediate repayment of short-term dollar debts. The banks could have tried to defend the respective currencies by running down the reserves, but eventually the currency would have to be devalued. The combination of these factors initiated the East Asian crisis in Thailand.

Table 2 shows the change in some of the crisis indicators in the five East Asian countries and India. In Malaysia, the ratio of financial institutions' claims-to-domestic GDP had increased to 144.6% by 1996. The Thai current account deficit reached 8% of the GDP in late 1996, prompting foreign creditors to withdraw their Thai stockholdings. Thailand's central

¹The concept of "original sin" is discussed by Eichengreen *et al.* (2003). It is a situation in which the domestic currency cannot be used to borrow abroad or long-term domestically. In the presence of this incompleteness, financial fragility is unavoidable because all domestic investments will have either a currency mismatch or a maturity mismatch.

Table 2. Selected Crisis Indicators

Country	Indicators			
	Current Account/GDP (%) 1996	Capital Account/GDP (%) 1996	Financial Inst. Claims on Private Sector/GDP (%)	
			1990	1996
Thailand	-8.0	10.6	83.1	141.9
Indonesia	-3.5	4.9	50.6	55.4
Malaysia	-5.3	9.4	71.4	144.6
Philippines	-4.3	11.0	19.3	48.4
Korea	-4.8	4.8	56.8	65.7
India	-1.6	3.1	26.8	24.7

Source: Radelet and Sachs (1998).

bank tried to initially support the baht in the face of declining inflows of foreign exchange, but then gave up.

The collapse of the Thai baht formally initiated the East Asian financial crisis. Other regional currencies followed suit, and the financial crisis rapidly turned into a full-blown downturn, with significant effects on the real sector.

Contagion, which may be defined as the transmission of a crisis to a particular country due to its real and financial interdependence with countries that are already experiencing a crisis (Fratzcher, 1998), was clearly evident in the case of the East Asian economies. Although the crisis was triggered off in Thailand's financial markets, it spread fairly quickly to Malaysia, Korea, Philippines and Indonesia. Real linkages between the economies meant that the effects were not delimited to the financial sector only. The affected economies witnessed a sharp decline in output, employment and standards of living.

The failure of the Thai central bank to support the baht and its subsequent float, or more correctly, depreciation on 2 July 1997, had an impact on the currencies of the neighboring countries such as Malaysia, Indonesia and Philippines.² By the early last quarter of 1997, the ringgit had lost 30% of its value (Table 3). In South Korea, the widespread bankruptcies of corporations sent stock prices spiraling downwards, which prompted foreign investors to dump their holdings. After initial attempts by the central bank to support the won by running down reserves and raising the interest rates, South Korea also abandoned the defense of its currency in November 1997. Hence, the financial interlinkages between the East Asian economies led to the transmission of the crisis that began in Thailand to the entire region, with the exceptions of Japan and Singapore.

From Table 3, it is shown that the highest percentage change in the baht occurred in January 1998, and this followed a persistent decline in foreign reserves from a high of more than \$31 billion in October 1997. Both these facts illustrate the advent of the currency

²Contagion is first manifested through the depreciation (sudden and large) in currencies across countries that have financial interlinkages.

Table 3. Foreign Exchange Reserves and Percentage Change in Exchange Rates

	India		South Korea		Malaysia		Thailand	
	% Change in Exchange Rate (from June 1997)	Foreign Exchange Reserves (\$bn)						
Jul-97	-0.22	29.64	0.23	33.45	2.45	21.82	23.60	30.35
Aug-97	0.29	29.85	0.90	31.14	9.66	22.11	32.58	25.86
Sep-97	1.59	29.15	2.41	30.43	19.91	22.27	44.30	29.54
Oct-97	1.18	29.65	4.13	30.51	30.61	22.34	53.05	31.21
Nov-97	3.94	27.61	15.97	24.40	34.13	21.88	59.96	26.18
Dec-97	9.36	27.57	65.68	20.40	49.49	20.90	80.25	26.89
Jan-98	9.31	27.60	90.56	23.51	73.63	19.82	116.03	26.57
Feb-98	8.51	27.18	82.62	26.71	51.23	19.92	87.61	26.08
Mar-98	10.32	28.76	67.11	29.75	48.14	19.91	68.34	27.61
Apr-98	10.67	29.04	56.33	35.54	48.07	19.86	62.36	29.46
May-98	12.76	28.35	56.78	38.76	50.91	19.83	60.45	27.38
Jun-98	17.79	26.77	57.12	40.90	58.49	19.81	73.39	26.50
Jul-98	18.69	26.82	45.04	43.02	64.95	19.65	69.16	26.70
Aug-98	19.29	27.59	47.84	45.09	66.71	19.69	71.24	27.79
Sep-98	18.68	28.90	54.70	46.98	51.38	20.82	65.64	27.29
Oct-98	18.13	29.44	51.10	48.83	51.04	22.86	56.43	28.48
Nov-98	18.36	29.40	45.00	50.02	50.94	23.09	49.91	28.89
Dec-98	18.97	29.83	36.58	52.04	51.03	25.68	48.94	29.54

Note: Bold numbers denote maximum levels.

Source: Various Central Banks and IFS.

crisis in Thailand. Malaysia and South Korea also saw the maximum depreciation in their respective currencies in January 1998. The foreign reserves in South Korea began to fall in October 1997. Unlike Malaysia, however, where the decline in reserves was not reversed almost until the last quarter of 1998, Korean reserves recovered almost immediately in April 1998. The Indian rupee did not experience such extreme depreciation. The maximum percentage change was only about 20%, and this occurred well after baht, won and ringgit had experienced their deepest depreciation. Foreign reserves did not fluctuate widely. These factors together suggest that India remained relatively immune from the contagion effect.

Table 3 shows some interesting results: Thailand, Malaysia and South Korea all experienced large deviations in the exchange rates³ from the trend level in June 1997. In contrast, India witnessed a comparatively mild change in the rupee-dollar rate during the same period.

³Exchange rates in Table 3 measure price of the US dollar in terms of the domestic currency. For example, the rupee-dollar exchange rate is the amount of US dollar per rupee. A fall in e therefore implies a depreciation of the domestic currency.

This reinforces the conclusions of Table 2: India was relatively isolated from the East Asian crisis.

To capture the effect of the depreciation of the baht on the other East Asian currencies during the crisis period, an index of currency pressure is developed in Dua and Sinha (2007). They first introduce a measure of currency pressure, a weighted average of the percentage devaluation of the domestic currency above its trend and the percentage loss in reserves. The weights used are measured as the inverse of the variance for each variable. e is the exchange rate in US dollars per unit of the domestic currency. $\overset{o}{e}$ measures the effect of an overvalued currency and is calculated using the difference of the average real exchange rate over the period prior to the crisis (September 1994 to May 1997) and the actual real exchange rate during each month of the crisis. The trend of the exchange rate ($(\sum \overset{o}{e})/n$) is measured as the average rate of nominal depreciation or appreciation prior to the crisis. Thus, the numerator of the first term ($(\overset{o}{e} - (\sum \overset{o}{e})/n)$) in Equation (1) measures the percentage devaluation of the domestic currency above its trend. Res is the amount of foreign exchange reserves in billions of dollars. $\overset{o}{Res}$ is calculated using the difference of the average foreign reserves over the period prior to the crisis (September 1994 to May 1997) and the actual reserves during each month of the crisis:

$$CC_t = \frac{(\overset{o}{e} - (\sum \overset{o}{e})/n)}{\sigma_e} + \frac{(\overset{o}{Res})}{\sigma_{res}}, \quad (1)$$

where n is the number of time periods and σ_e and σ_{res} are the standard deviations of the percentage changes in the exchange rate and reserves over the period January 1993 to May 1997. The measure may be interpreted as follows: a depreciation of the domestic currency, i.e., a fall in e and a fall in reserves res , reduces the value of CC and hence represents higher currency crisis. A higher value of the currency pressure measure indicates a lower contagion level.

The index of currency pressure is constructed for India, South Korea, Malaysia and Thailand. As monthly data is irregular for the Philippines and Indonesia for the period of analysis, these two countries are excluded from our analysis.

We provide a graphical analysis of the crisis using Figures 1–8. These illustrate the impact of the crisis in two sub-periods — July 1997 to February 1998, and March to December 1998. For country-specific discussion, we refer to figures for Thailand (Figures 1 and 2), Malaysia (Figures 3 and 4), South Korea (Figures 5 and 6) and India (Figures 7 and 8). The first set of the figures in each pair refers to the corresponding graphs of exchange rate and foreign reserves movement; the second set is the path of the index of currency pressure. Pair-wise figures capture the fluctuations in the exchange rates, foreign reserves and the index of currency pressure in each country.

Although the baht experienced its biggest depreciation in January 1998, the currency pressure index fluctuated wildly between July 1997 and March 1998. It is noted from Figure 1 that the baht depreciated by almost 50% in July 1997 at the onset of the crisis. Corresponding to this time, Figure 2 shows that the index attained its lowest value, i.e., currency pressure was very high.

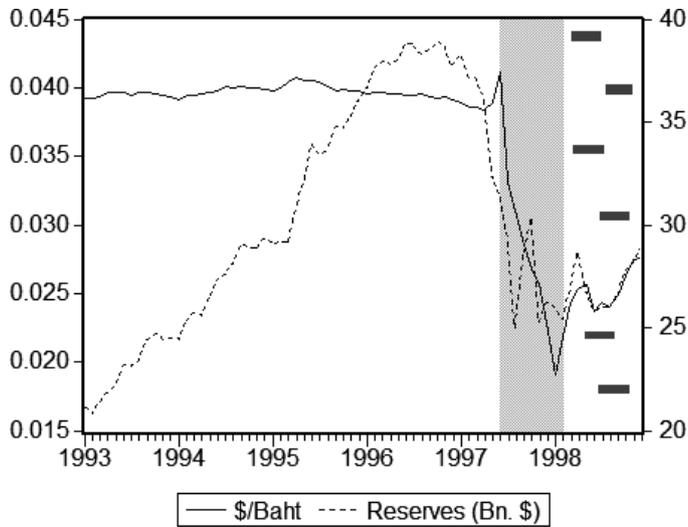


Figure 1. Exchange Rate and Foreign Exchange Reserves in Thailand

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

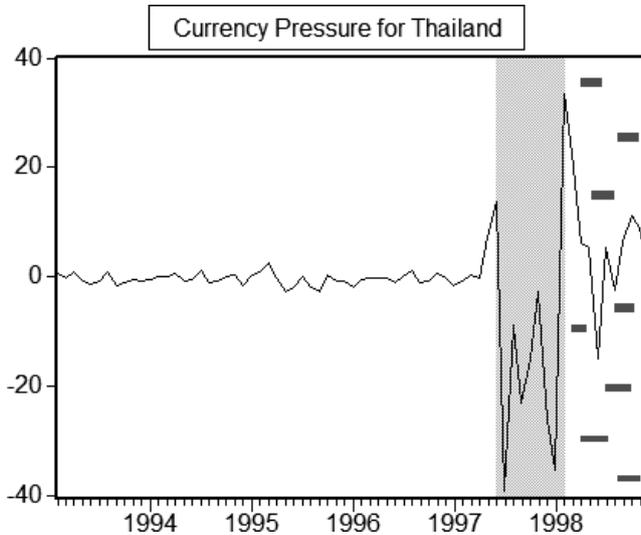


Figure 2. Index of Currency Pressure from February 1993 to December 1998 in Thailand

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

For the case of Korea, as mentioned earlier, the central bank tried to defend the currency against early speculative attacks. It can be seen from Figure 5 that when the bank abandoned the defense of the won in November 1997, it plummeted. At this time, Figure 6 shows that the currency pressure index attained its lowest values in December 1997 and January 1998.

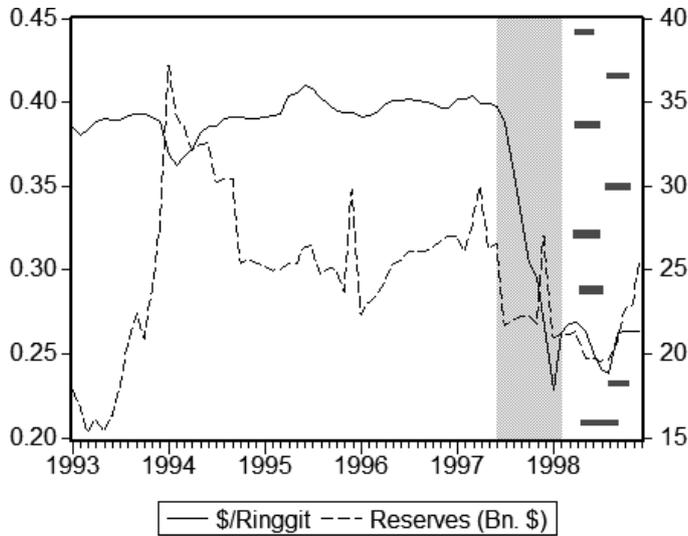


Figure 3. Exchange Rate and Foreign Exchange Reserves in Malaysia

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

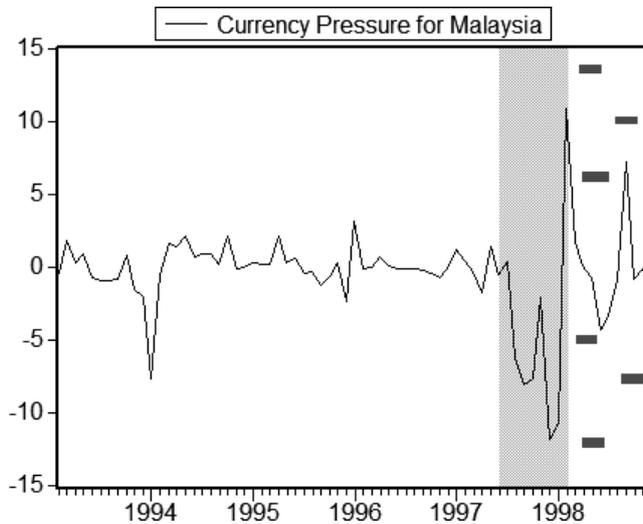


Figure 4. Index of Currency Pressure from February 1993 to December 1998 in Malaysia

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

Although the case of Malaysia was different from the other affected countries by the management of the crisis later, it also abandoned its quasi-currency peg. Within days of the Thai baht devaluation, the Malaysian ringgit was hit by a speculative attack. For the period of analysis, Figure 4 shows that the index for Malaysia fell to its lowest values, coinciding

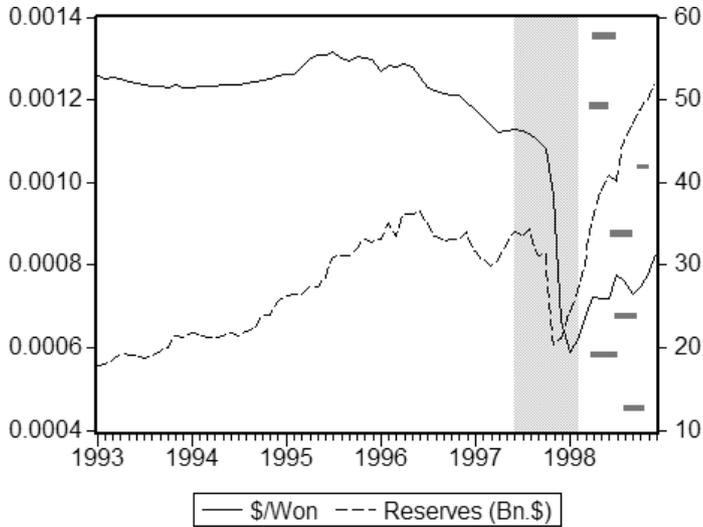


Figure 5. Exchange Rate and Foreign Exchange Reserves in Korea

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

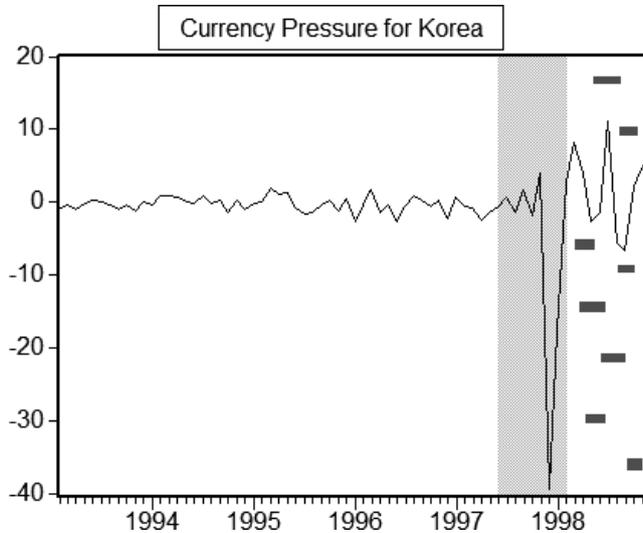


Figure 6. Index of Currency Pressure from February 1993 to December 1998 in Korea

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

with the largest depreciation of the ringgit. It can also be seen from Figure 3 that foreign reserves had fallen at the time the country was trying to maintain the currency peg.

India experienced some of the fluctuations in the currency pressure index that affected the East Asian economies, but these were not as sharp as in the crisis-hit economies. The index did see some falls in November and December 1997 and later in June 1998 as evident

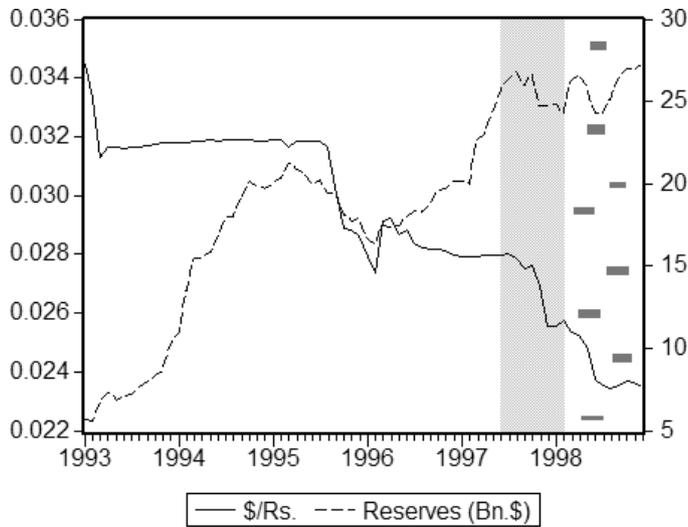


Figure 7. Exchange Rate and Foreign Exchange Reserves in India

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

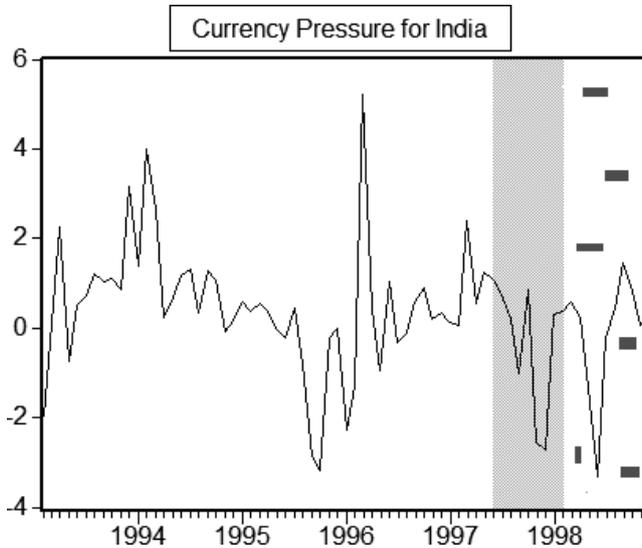


Figure 8. Index of Currency Pressure from February 1993 to December 1998 in India

Note: The light grey shaded region denotes the first sub-period of the crisis (July 1997 to February 1998). The dotted region is the second sub-period (March 1998 to December 1998).

from Figure 8. The largest depreciation of the rupee came in August 1998. It is interesting to note that the rupee appreciated marginally in July 1997, at a time when Thailand, South Korea and Malaysia experienced depreciation. From Figure 7, it can be seen that after the depreciation of the rupee, foreign reserves began to increase again.

Korea led a temporary turnaround in the Asian financial markets. As can be seen from Figures 5 and 6, the exchange rate and currency crisis measure recovered slightly after December 1997. By March 1998, however, the Asian financial markets suffered another setback, and the values of relevant variables (exchange rates, foreign reserves and currency crisis measure) worsened rapidly again. The renewed financial pressure began to abate about May/June 1998. The won began to stabilize, gaining against the US dollar, and was followed by other Asian currencies recovering.

By November 1998 and January 1999, Thailand and Korea were well on their way to recovery. In case of Malaysia, the ringgit had bottomed out by June 1998.

2.1. Contagion effects

The measure of currency pressure developed above is now used to analyze the contagion effects. From mid-August 1997, the contagion spread rapidly to other ASEAN economies and by October, its effects were felt outside this bloc of countries. The East Asian economies continued to feel the effects of contagion until December 1997 and January 1998.

In the first period, as seen in Figure 2, Thailand experienced significant currency pressure through all the three channels — money supply, foreign reserves and the exchange rate. The path of the currency pressure index is extremely volatile. Similarly, the index was volatile for Malaysia and Korea (Figures 4 and 6). However, it can be seen that India did not experience wild fluctuations in the currency pressure index (Figure 8).

Currency pressure in Thailand and Korea tapered off in the second sub-period. Malaysia, however, continued to experience a volatile index, even though the fluctuations were less extreme compared to the first part of the crisis period. This period did see more fluctuations in the index for India — both with respect to the other economies, as well as compared to the previous sub-period.

Dua and Sinha (2007) study the contagion effects of the East Asian crisis for Thailand, Korea, Malaysia and India using panel data analysis. As Thailand was where the crisis originated, it is treated as a case of currency pressure rather than contagion. Malaysia and Korea showed significant contagion effects between June 1997 and December 1998. However, India did not exhibit any such effects for the period.⁴ GDP growth rates of the affected countries in the neighborhood of the crisis period shown in Table 4 illustrate India's relative insulation. The five crisis-hit East Asian countries (Thailand, Korea, Malaysia, Indonesia and Philippines) as well as India clocked GDP growth rates of over 6% in 1996. By 1998,

⁴A detailed analysis of the contagion effect is present in Dua and Sinha (2007). The contagion model is estimated using panel data for the four countries — India, Thailand, Korea and Malaysia — over the period June 1997 and December 1998 as follows:

$$CC_{it} = \alpha_{it} + \beta_{1i}m_{it} + \beta_{2i}res_{it} + \beta_{3i}e_{it} + u_{it},$$

where i is the index of countries and t is the time index in months. Three economic fundamentals are used to examine the contagion effect: m is the ratio of money supply, M3, to the index of industrial production (y); res is the ratio of foreign reserves to y ; and e is the real exchange rate. The literature on contagion models expects CC to be negatively related to m and e , and positively related to res . The estimation results indicate that there was only weak contagion effect in India. This is in sharp contrast to the results of other countries.

Table 4. GDP Growth During the East Asian Crisis Period

Country	GDP Growth Rate (%)		
	1996	1997	1998
Thailand	6	-1	-11
Malaysia	10	7	-7
Korea	7	5	-7
Indonesia	8	5	-13
Philippines	6	5	-1
India	7	4	6

Source: World Development Indicators.

the East Asian countries recorded negative growth rates, while India's growth rate remained robust.

3. India's Prelude to the East Asian Crisis

It is clear from Section 2 that there was very little contagion in India. As figures in Table 2 reiterate, India did not exhibit similar crisis indicators.

India had learnt from the lessons drawn from its own external crisis in 1991, several of which were reinforced by the Mexican peso crisis. In this section, we first present a brief overview of the Indian exchange rate experience. This is followed by a discussion of the exchange rate policies adopted by the central bank in the 1990s, many of which helped India to insulate itself from the East Asian crisis.

We begin with some background on India's economy leading to the liberalization measures. Preceding the first economic crisis in 1965–1967, which was a result of two successive droughts, independent India suffered a “quiet” balance of payments (BOP) crisis. Slow growths of agriculture and exports combined with the large investment demands of the third Five-Year Plan led to a balance of payments deficit that was contained using import controls. These were extremely severe and hampered both production and exports. Even before the crisis of 1965 was fully realized, there were already concerns about the low level of foreign reserves.

In June 1966, India experienced its first major devaluation, following the recommendations of the World Bank. Reserves had, by this time, hit rock bottom. In nominal terms, the devaluation was massive: from 4.76 to 7.5 rupees (36.5%) per US dollar. This was accompanied by other liberalization measures. Between 1965 and 1970, the balance of payments situation improved, despite large falls in the net foreign aid disbursed. Foreign reserves increased, reaching some of the highest levels seen in the past decade. However, reserves fell again in 1971.

The second macroeconomic crisis hit the country between 1973–1975. The balance of payments started to deteriorate in October 1973 as a result of oil price increases. Terms of trade worsened by 40% between 1972 and 1975, and the current account deficit increased

from \$455 million to \$951 million during the same period. The fall in the current account occurred despite the increase in exports. However, a combination of policies ensured that the deficit fell to \$91 million in 1975–1976.

The role of the exchange rate policy was also very important. Between December 1971 and September 1975, the rupee was pegged to the pound sterling. As the sterling was weak during this period, the rupee could depreciate with it, without setting off alarm bells. Thus, the fall in the nominal exchange rate from 1972 to mid-1975 was more than necessary to compensate for the high domestic inflation, and real exchange rate depreciated by about 10% (Joshi and Little, 1994). In September 1975, India switched to a multi-currency peg with undisclosed weights.

The crisis of 1979–1981 was similar to the previous one. The current account went from a surplus to a deficit of 26% in one year (between 1978–1979 and 1979–1980). The role of the government was significantly less interventionist during this third crisis compared to the previous ones. Inflation rose for close to three years, starting in 1979. The oil price shock pushed up import prices by approximately 50%. However, as there had been a large accumulation of foreign reserves at the beginning of the crisis, import controls did not need to be tightened. By 1981–1982, however, reserves had fallen by more than \$2 billion. Even though the worsening terms of trade required its devaluation, the real effective exchange rate appreciated by approximately 15% between 1979 and 1981. As India's domestic inflation was higher than its trading partners, to stop the real exchange rate from appreciating would have required a devaluation of the nominal effective exchange rate in 1980. This was problematic since the rupee was pegged to an undisclosed basket of currencies and a devaluation would have required a change of peg or a devaluation by stealth (Joshi and Little, 1994). Moreover, at that time, a devaluation was a sensitive issue politically. Finally, a policy of devaluation by stealth was undertaken after 1982.

In 1983, the management of the exchange rate became more sophisticated. One of the positive developments was that the real exchange rate became the variable in focus, and the determination of the nominal exchange rate became less politicized. However, despite the current account adjustment in 1982–1984, current account deficit as a proportion of GDP increased sharply between 1985 and 1990. Additionally, exports stagnated towards the end of the 1980s decade due to the real exchange rate appreciation. Thus, the seeds of the 1991 crisis were sown in the previous decade.

3.1. *Crisis of 1990–1991*

The Indian economy experienced its most far-reaching balance of payments crisis in 1990–1991. The crisis was mainly due to a combination of internal weaknesses along with problems of the external sector. Within the economy, the main causes were excessive regulation of private industry and trade by the government, a weak financial system and high fiscal deficits. In the external sector, the primary contributing factor was an overvalued exchange rate. At the same time, two external shocks acted as a catalyst to push the economy into a crisis. First, the Gulf War caused oil prices to rise and increased the value of India's oil imports. The Gulf War also caused a sharp fall in the remittances from Indians in the

Gulf region, thus increasing the pressure on India's balance of payments. The global slowdown during this period exacerbated the crisis by causing a slowdown in the growth rate of India's export volumes. The result was a loss of investor confidence that resulted in a credit downgrade.

The government undertook a comprehensive plan to deal with the crisis, among which, one was to devalue the exchange rate and transform the system from a discretionary, basket-pegged system, to a market-determined, unified exchange rate, following a short intermediate period of dual rates.

3.2. *How the crisis built up*

At the end of the 1980s, domestic demand increased due to the drop in the volatility of the agricultural sector in 1989–1990 as well as the expansion in domestic credit creation. Government spending was very significant during this time, and the fiscal deficit rose to 10% of the GDP. Domestic inflation rate was over 12% and the current account deficit was increasing to about 3% of the GDP. In addition, by September 1990, the net capital inflows of Non-Resident Indians, which had been significant, turned negative. Access to short-term credit and commercial borrowings were extremely restricted and difficult. Thus, this time round, macroeconomic policy mismanagement played a much more central role. As India's creditworthiness was downgraded by international agencies, foreign investment dried up. India's foreign reserves reached one of the lowest levels in recent history — approximately US\$1 billion, which was just enough for a two-week imports. The Reserve Bank of India (RBI) was forced to send gold to the Bank of England and the country was almost defaulting on its foreign liabilities. At this time, the government turned to the IMF for help.

Fiscal policy was extremely lax: the fiscal deficit increased from 8%–10% of the GDP between 1980 and 1989. In the 1970s, the fiscal deficit had averaged about 4.5%. Balance of payments worsened despite rapid growth in exports and a fall in oil prices. According to Joshi and Little (1994), the crisis of 1990 originated in the mismanaged policy decisions taken after the second oil shock. Real exchange rate appreciation resulted in stagnation in exports. Fiscal deterioration was unchecked and led to a worsening current account deficit, even as domestic and foreign debts increased rapidly.

Domestic demand pushed up the overall growth in the economy, but it had other adverse effects. The liberal trade regime made it difficult for the government to use traditional policies to control the burgeoning current account deficit. Therefore, the policy response hinged on using quantitative restrictions on imports. Other IMF-recommended policies included restricting domestic demand via reducing credit expansion and intense fiscal tightening. These resulted in dismal rates of growth: real GDP growth slowed down to less than 1%. The same period also saw a 19% devaluation of the rupee, backed with IMF credit.

Even though overall growth slowed down, the balance of payments situation improved dramatically. The deficit of 3.5% of the GDP in 1990–1991 fell to about 0.7% in 1991–1992. Foreign reserves increased to about \$6 billion. In July 1991, the rupee was devalued by 18% and this became one of the first actions of the liberalization program.

3.3. Liberalization of the Indian economy

By 1991, an ambitious plan for the liberalization of the Indian economy was introduced by the new government. The aim was to liberalize markets and introduce greater market orientation into the system. The main policy measures aimed at reducing high fiscal deficit, controlling high inflation levels and regulating monetary policy further. Some of the reforms are discussed below.

3.3.1. Financial sector reforms with market-determined interest rates

The banking sector was one of the biggest beneficiaries of the reform program. The banking sector forms the largest part of the financial sector in India. More than 80% of the funds flowing through the financial sector are accounted for by the banks. In 1969, most major banks had been nationalized, and the share of private sector banks fell to about 11%. Bank activities such as setting interest rates and commercial borrowings were heavily regulated.

In the 1991 reform program, the policymakers gave considerable importance to the banking sector. At the time, investor and deposit protection was mostly non-existent, and the sector was plagued with low profitability. Some of the measures put in place were: financial and accounting statements of banks were made more transparent and aligned to international standards; the administrated interest rate structure was dismantled and most important interest rates such as the deposit rate were market-determined; criterion for determining Non-Performing Loans (NPL) was tightened and the 364-day Treasury bills and 5- and 10-year bonds were introduced by the government. Public sector banks were allowed to access the capital markets and the reduction of mandatory allocation of their credit to priority sectors improved profitability. There were also stringent, prudential limits on the exposure of financial intermediaries to stocks and real estate.

These reforms undertaken from 1991 through 1997 improved the financial soundness and credibility of banks, increased competitiveness within the system and made the institutional framework more resilient to crises.

3.3.2. Monetary policy reforms and diversification of monetary instruments

Prior to 1991, the main goal of monetary policy was to neutralize the impact of the fiscal deficits. Money supply was driven largely by the government resorting to central bank borrowing through automatic monetization and *ad hoc* bill issuance. Thus, there was a close link between fiscal and monetary policies. This was gradually phased out of the system with restraints on automatic monetization of budget deficits. There was also emphasis on the development of money and financial markets including those for government securities and bills. Open market operations were activated to impact liquidity and the central bank increasingly used the repo (repurchase agreements) rate as well as overnight call money intervention. The Bank Rate was also restored as a signaling instrument for monetary policy and there was a phased reduction in the reserve requirement ratios of the cash reserve ratio and the statutory liquidity requirement. As we shall see later, monetary policy was used actively during the crisis period to stabilize the volatility in the foreign exchange market.

3.3.3. *Capital account reforms with reasonable degree of capital control*

Although wide-ranging measures were taken in the financial sector, the role of the central bank, and monetary and fiscal policies, the government remained cautious about full capital account convertibility. Foreign direct investment (FDI) was allowed into the country only after 1991. The current account was made fully convertible in August 1994, following the IMF program. Further deregulation measures were adopted by the RBI following the slow-down of foreign capital after the Mexican crisis. Despite significant liberalization measures, restrictions remained. We briefly discuss the specific capital controls imposed in India as well as their selective relaxation.

Before 1991–1992, FDI was controlled on a case-by-case basis and was therefore reduced to a trickle. In the liberalization program, automatic approval of foreign investment for up to 51% of shareholding was allowed for a wide range of industries. By 1996, the number of industries where FDI was allowed was expanded considerably, and in some cases, foreign equity of up to 74% was allowed.

Prior to the reform measures of 1991–1992, foreign portfolio investment was mostly not allowed. In 1992, some foreign institutional investors (FIIs) such as pension funds and mutual funds were permitted to invest in listed securities in the primary and secondary markets in equities and bonds. By 1997, the FIIs could invest in government securities and Treasury bills as well. Capital income and capital gains could also be repatriated at the market exchange rate.

Several other kinds of capital controls did not see much relaxation. Offshore borrowing by Indian companies continued to be controlled on a case-by-case basis by the government. An overall annual ceiling for external commercial borrowing was also maintained. Commercial banks were not allowed to maintain deposits or make loans in foreign currencies. Their foreign assets and liabilities were also strictly controlled. Thus, overall, the internationalization of the rupee was strictly controlled. Offshore trading of the rupee was prohibited. Policy was generally directed towards limiting forward trading in the foreign exchange to hedging current account transactions. Thus, the forward market lacked depth and was liquidity-deficient. In fact, all of these controls on capital market liberalization helped to insulate India from the East Asian crisis.

3.3.4. *Reform towards greater exchange rate flexibility*

The RBI undertook policies to move towards a market-determined exchange rate system along with the liberalization measures discussed above. This was a marked contrast from the pegged regime before. As shown in Table 5, India had put in place a rupee exchange rate system whereby the currency was pegged against a basket of international currencies. In the early 1990s, amongst the several measures taken to tide over the crisis was a devaluation of the rupee in July 1991 to maintain the competitiveness of Indian exports. This initiated the move towards greater exchange rate flexibility. A liberalized exchange rate management system (LERMS) was put in place in March 1992 along with other measures to liberalize trade, industry and foreign investment. This made the rupee partially convertible on the current account through a dual exchange rate.

Table 5. Chronology of the Indian Exchange Rate

Year	The Foreign Exchange Rate Market and Exchange Rate
1947–1971	Par Value system of exchange rate. Rupee's external par value was fixed in terms of gold with the pound sterling as the intervention currency.
1971	Breakdown of the Bretton Woods system and floatation of major currencies. Rupee was linked to the pound sterling in December 1971.
1975	To ensure stability of the rupee, and avoid the weaknesses associated with a single currency peg, the rupee was pegged to a basket of currencies. Currency selection and weight assignment was left to the discretion of the RBI and not publicly announced.
1978	RBI allowed the domestic banks to undertake intra-day trading in foreign exchange.
1978–1992	Banks began to start quoting two-way prices against the rupee as well as in other currencies. As trading volumes increased, the "Guidelines for Internal Control over Foreign Exchange Business" were framed in 1981. The foreign exchange market was still highly regulated with several restrictions on external transactions, entry barriers and transactions costs. Foreign exchange transactions were controlled through the Foreign Exchange Regulations Act (FERA). These restrictions resulted in an extremely efficient unofficial parallel (<i>hawala</i>) market for foreign exchange.
1990–1991	Balance of Payments crisis (see above).
July 1991	To stabilize the exchange rate market, a two-step downward exchange rate adjustment was done (9% and 11%). This was a decisive end to the pegged exchange rate regime.
March 1992	To ease the transition to a market-determined exchange rate system, the Liberalized Exchange Rate Management System (LERMS) was put in place, which used a dual exchange rate system. This was mostly a transitional system.
March 1993	The dual rates converged, and the market-determined exchange rate regime was introduced. All foreign exchange receipts could now be converted at market-determined exchange rates.

Source: Reserve Bank of India.

In March 1993, India switched over to a unified market-determined exchange rate system from the existing dual rate regime. Since 1993, the exchange rate has exhibited fluctuations that have been more severe during the crisis period. For instance, it depreciated by 6.31% between July 1997 and March 1998 and by approximately 11% from July 1997 to December 1998 (Table 3). Foreign currency reserves fell from \$29 billion to \$26.77 billion between July 1997 and June 1998. But by December 1998, reserves increased to \$29.83 billion.

As the capital account was liberalized and capital inflows increased, there was increasing pressure on the rupee to appreciate. To prevent a decline in competitiveness due to this, the RBI purchased some of these inflows and added them to the foreign reserves. The subsequent increase in reserves led to an extended period of stability of the currency.

Until July 1995, the exchange rate markets were fairly stable. As the capital account was liberalized, capital inflows increased enormously during this period. Foreign currency assets of the RBI increased from US\$6.4 billion to US\$20.8 billion between March 1993 and March 1995. This helped in maintaining the stability of the rupee.

Between August 1995 and March 1996, a change in international capital flows following the Mexican crisis, a rise in the current account deficit, and an appreciation of the US dollar put pressure on the rupee, ending the previous phase of stability. The size and frequency of direct interventions by the RBI increased during this time (see below).

In the period immediately preceding the East Asian crisis (April 1996 to mid-August 1997), the foreign exchange market regained most of its previous stability. Capital flows and reserves also reached their previous levels.

The East Asian crisis and the subsequent contagion effects had significant effects on the Indian foreign exchange rate market. For instance, the rupee depreciated by over 9% between June 1997 and December 1997 and by approximately 19% from June 1997 to December 1998 (Table 3). Foreign currency reserves fell between July 1997 and June 1998, but reversed by December 1998. These effects were, however, small compared to the corresponding changes in Thailand, South Korea and Malaysia as indicated in Table 3.

4. How Did India Insulate Herself from the East Asian Crisis?

Some of the factors that helped to insulate India relatively from the crisis include the following: (1) India's progression towards a flexible exchange rate with timely exchange market intervention and implementation of monetary policy measures by the central bank; (2) limited capital liberalization with restrictions on capital flows; (3) financial reforms towards strengthening the institutional framework, improving transparency and imposing prudential limits on exposure to real estate and stocks; and (4) India's weak trade linkages with the crisis-hit East Asian economies. The liberalization program undertaken after the BOP crisis in 1990–1991 also contributed towards ensuring strong macroeconomic fundamentals in the Indian economy.

While the crisis-hit East Asian countries also exhibited strong macroeconomic fundamentals before the crisis, a stark difference between India and the five Asian economies is that capital flows (including portfolio equity investment) into these economies were large and variable. The juxtaposition of high private credit and volatile capital flows in response to opportunities for profits leading to asset price inflation fueled the crisis.

Nevertheless, although India was relatively closed in terms of capital liberalization, it was not totally immune from the crisis. Some of the policy measures that provided support to India during the crisis period are explained below. The intervention policy adopted by the central bank is described in detail followed by a brief discussion on monetary policy measures and capital controls.

4.1. Intervention by the RBI

Since August 1994, the rupee has been convertible on the current account and the process of integration of the Indian financial market with the rest of the world has been underway. Capital account convertibility is allowed for foreigners, foreign-based corporate and non-resident Indians. Several types of exchange controls have been dismantled and the Indian rupee is no longer pegged. The RBI, however, continues to follow a policy of managed float. The managed float of the rupee has two objectives — to foster international competitiveness and to limit daily market volatility.

The exchange rate regime can be interpreted as “more flexible” during normal market conditions, and “managed” when chaos prevails. In the former case, exchange rate changes

may be viewed as “passive”, while in the latter case, central bank’s intervention is “active”. The objective behind the passive exchange rate changes is to avoid persistent misalignment, whereas in the case of active intervention, the objective is to avoid disruptive market corrections. During the phases of active intervention, measures of “leaning against the wind” may be applied, while “leaning with the wind” would be the theme of the passive episode. Intervention is used for several reasons: evening out the volatility of the exchange rate and correcting the misalignment in relation to fundamentals, as well as to prevent depreciation of the rupee and keep it along the desired macroeconomic path.

We use the empirical observations on intervention and exchange rate volatility to show that the Bank was generally averse to excessive fluctuations of the exchange rate during the crisis, and took measures to moderate the movements in the case of volatility in the foreign exchange market. The high correlation between volatility and monthly changes can be easily seen from Figure 9, which shows the level of RBI intervention during the East Asian crisis period as measured by sales and purchases of the US dollar. Gross intervention is the sum of purchases and sales of the US dollar, irrespective of the sign. Net intervention is the same, except that the sum takes account of the signs. The monthly percentage changes and volatility⁵ of the exchange rate is plotted in Figure 10. Using Figures 9 and 10, we note the close association between the Bank’s intervention and the volatility of the exchange rate — higher level of intervention in January 1998 was used in view of the significantly higher volatility of the rupee–dollar exchange rate between November–December 1997. High volatility between May–July 1998 resulted in the second major spike in intervention activity between July and September 1998. Thus, the RBI used its intervention strategy

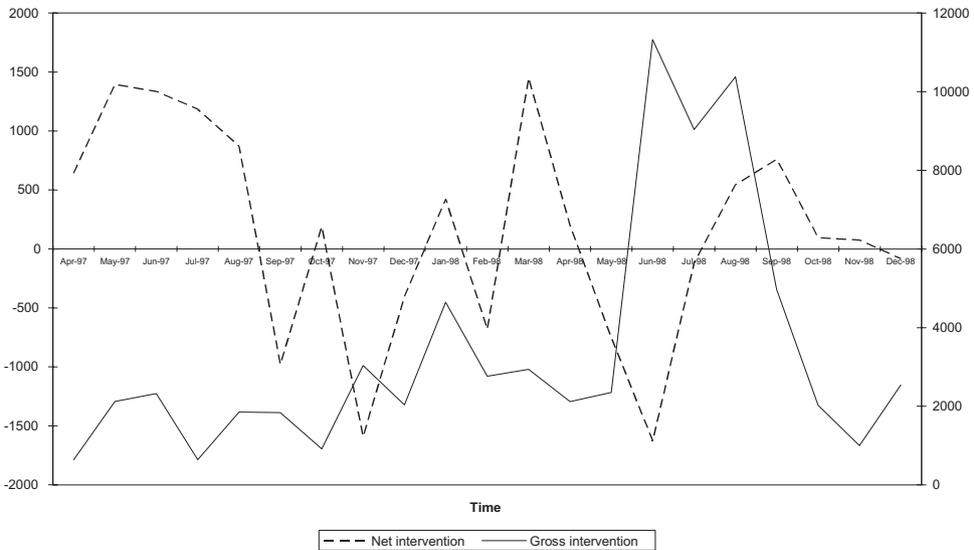


Figure 9. RBI Intervention

⁵Volatility is measured by the moving three-month standard deviation of the exchange rate.

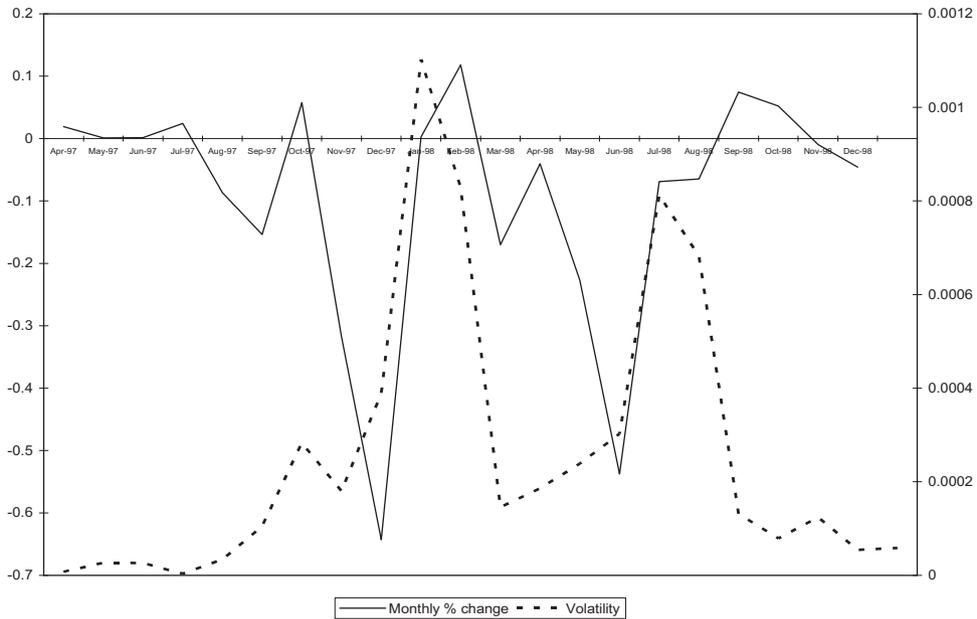


Figure 10. Exchange Rate Monthly Changes and Volatility

to temper the volatility of the exchange rate following periods of large fluctuations in the exchange rate during the crisis period.⁶

This intervention strategy thus played an important stabilizing role during the crisis. Substantial intervention by the Bank in the spot and forward exchange rate markets helped to curb speculative pressures and excessive volatility. The risk of destabilization was reduced by allowing exchange rate flexibility to some extent. It is clear from the discussion above and Figures 9 and 10 that the RBI's intervention activity helped to curtail volatility during the East Asian financial crisis. It is also worth noting that while the central bank's intervention activities were able to impart stability to India's foreign exchange market, similar actions were not possible in some of the East Asian countries due to their fixed parity with the dollar.

4.2. Monetary policy of the RBI

Monetary policy was tightened in a phased manner from November 1997 onwards as RBI interventions were deemed inadequate in controlling the volatility of the foreign exchange market. This resulted in a mid-January 1998 package that signaled an increase in interest rates and increased the reserve requirements. The pressures of the foreign exchange market

⁶In the current exchange rate regime, the bank adheres to the "managed floating" doctrine with some intervention. Over recent years, the broadly market-determined exchange rate policy has implied that the Indian exchange rate has demonstrated adequate flexibility against major world currencies. The central bank has been selling and buying US dollars in the foreign exchange market to reduce volatility caused by the demand-supply mismatch. It is important to note, however, that such interventions are not to maintain the exchange rate in any predetermined band. In recent years, as capital movements have increased, the exchange rate has become more volatile.

Table 6. Share of East Asian Countries in India's Exports and Imports

Country	Exports (%)	Imports (%)
Thailand	1.03	0.90
Malaysia	1.12	1.79
Korea	1.77	3.25
Indonesia	1.33	2.20
Philippines	0.48	0.15

Source: Centre for Monitoring Indian Economy, *Monthly Review*.

Note: Figures are for 2005–2006 fiscal year.

forced the RBI to resort to the “announcement effects” of the Cash Reserve Ratio (CRR), despite its previous commitment to use Open Market Operations (OMO) as the preferred indirect instrument of monetary policy. Other than the CRR and repurchase operations, the RBI also used export credit and surcharges on import finance. The program of reducing the CRR was deferred to the future in November 1997. Additionally, a fixed repo rate of 4.5% was introduced to absorb surplus liquidity. In December 1997 and January 1998, the CRR was increased by 1%. Similarly, the interest rates on repos were further increased: first to 5% and then further to 9%. The reverse repo facility was made available to Primary Dealers in Government Securities market at the Bank Rate on a discretionary basis. The Bank rate rose from 9% to 11% in January 1998. In April 1998, the monetary measures were eased and the CRR was reduced to its pre-crisis levels. Interest rate on fixed repos was reduced to 7% and later to 6%. Monetary policy was tightened again in August 1998 (Acharya, 2006). As a result of these measures, the rupee began to stabilize and market expectations of further depreciation were reversed.

4.3. Trade linkages with East Asian countries

India's relative isolation from the contagion effects of the East Asian crisis can also be explained by her weak trade linkages with the other affected countries. Exports of 10 major East Asian countries (Thailand, Malaysia, Korea, Indonesia, Philippines, China, Hong Kong, Singapore, Japan and Taiwan) amongst themselves account for about 50% of their total exports. Trade ties are thus strong. However, as can be seen from Table 6,⁷ the East Asian economies affected by the crisis account for only a small portion of India's foreign trade.

4.4. Restrictions on capital flows

Traditionally, there have been two kinds of capital controls: (1) targeted measures to regulate short-term inflows and outflows, and (2) pervasive restrictions on all sorts of capital transactions.

⁷Ratios are indicative of trade for the past few years.

Targeted measures include unremunerated reserve requirements, limits on open currency positions, taxes on cross-border flows and quantitative restrictions on portfolio transactions.⁸ These kinds of measures are usually used in episodes of “overheated” portfolio inflows, or large capital outflows in a crisis period, when there are concerns about the effect of such flows on domestic interest rates and money growth.

Pervasive restrictions have usually been used to allow full use of domestic resources, without worrying about external volatility and influence. These include prohibitions on capital inflows and outflows, requiring approval for capital transactions, multiple exchange rate regimes, and often, current account restrictions. These kinds of measures were present in India before and during the East Asian crisis and helped to limit the contagion effect of the East Asian financial crisis in India.

5. Conclusions

This paper analyzes the effect of the East Asian financial crisis on the Indian exchange rate movements *vis-à-vis* those of the three other affected countries. Active intervention by the Reserve Bank of India, controls on capital flows, weak trade linkages, financial sector reforms and strong macroeconomic fundamentals helped India to be relatively immune from the East Asian crisis. Before the onset of the crisis, unlike the other afflicted East Asian countries, India was also able to keep short-term debt under control in relation to foreign reserves and total debt. This in turn enabled India to avoid an unstable debt structure. This was a direct result of controls on debt-creating short-term inflows.

Financial markets in India also saw a paradigm shift. In the pre-liberalization era, they were characterized by administered interest rates, quantitative ceilings, captive markets for government securities, pegged exchange rate, current and capital account restrictions. Various reforms have ensured that the markets have made the transition to a regime of market-determined interest and exchange rates, price-based instruments of monetary policy, current account convertibility and phased liberalization of the capital account.

While India was able to insulate herself from the East Asian crisis to a large extent, the imperative question a decade after the East Asian crisis is whether India is equipped to avert any future crises. As India moves towards greater integration with the global economy, several lessons from her own 1990–1991 crisis, the Latin American crisis as well as the East Asian crisis have been learnt. These include the importance of ensuring prudential norms in the financial and banking sectors, reducing the exposure of the financial sector to speculative markets including real estate and stocks; maintaining fiscal stringency; keeping external debt and the current account deficit at a low level; reducing volatility in the foreign exchange markets; as well as ensuring stability in capital flows.

To better understand the current state of the Indian economy, we examine first, the macroeconomic fundamentals of the economy, and second, the exposure of the economy to foreign capital inflows.

⁸Among the East Asian countries, Thailand and Malaysia are good examples of countries that used targeted measures during the 1997 crisis. Both economies have been fairly open to portfolio capital flows.

Table 7. Indian Economy — Key Variables

	External Indicators									
	1990– 1991	1995– 1996	1996– 1997	1997– 1998	1998– 1999	1999– 2000	2000– 2001	2003– 2004	2004– 2005	2005– 2006
Trade Balance*	14.6	21.5	18.8	18.7	18.3	19.4	22.4	24.3	29.3	32.9
Exports*	5.8	9.1	8.7	8.5	8.0	8.2	9.9	11	12.2	13.2
Imports *	8.8	12.4	10.2	10.1	10.2	11.1	12.5	13.3	17.1	19.7
Current Account Deficit*	-3.1	-2.7	-1.2	-1.4	-1.0	-1.0	-0.8	2.6	-0.4	-1.3
REER	99.98	100.97	98.95	103.07	94.34	95.28	99.3	99.04	99.68	102.27
NEER	88.04	89.09	89.03	91.97	90.34	90.42	88.48	88	90.5	88.96
Exchange Rate: Re/\$	17.94	35.69	35.49	37.16	42.07	43.33	47.07	45.6	44.63	45.29
Foreign Exchange Reserves (billion \$)	5.8	21.7	26.4	29.3	32.5	38	42.3	113	141.5	151.6
External Debt*	28.7	26.2	23.4	22.1	21.2	21.2	20.5	19.6	18.1	15.8
	Key Economic Indicators									
	1990– 1991	1995– 1996	1996– 1997	1997– 1998	1998– 1999	1999– 2000	2000– 2001	2003– 2004	2004– 2005	2005– 2006
Real GDP Growth	5.6	7.3	7.8	4.8	6.5	6.1	4.4	7.5	8.5	9
Saving*	23.1	25.1	23.2	23.1	21.5	24.2	23.4	29.7	31.1	32.4
Investment*	26.3	26.9	24.5	24.6	22.6	25.3	24	28	31.5	33.8
Fiscal Deficit (of Center and State)*	9.4	6.5	6.4	7.3	9.0	9.5	9.4	8.5	7.5	7.4
Inflation (WPI)**	—	8.0	4.6	4.4	5.9	3.3	7.2	5.5	6.4	4.4

Source: Reserve Bank of India, *Handbook of Statistics; Economic Survey, 2007*.

*Expressed as % of GDP; **WPI for All Commodities with 1993–1994 as base year.

India's current macroeconomic fundamentals are shown in Table 7. These show that India's macroeconomic fundamentals should be able to hold it in good stead in the years to come. The growth indicators show that the GDP growth approximately doubled between 1990–1991 and 2005–2006. The rate of GDP growth rose from about 3% in the 1950–1980 period to 6% in the 1980s and 1990s. In the last four years, between 2003 and 2007, the economy grew at 8.5% on average. Thus, there is tangible evidence of self-accelerating growth. The ratios of savings and investment to GDP have grown and inflation has been kept in check. Prices have been mostly stable. In line with the growing economy, the share of agriculture in GDP has also reduced to 20% from 40% in the 1970s, while the services sector is burgeoning to 60%.

The fiscal position of the government has also improved considerably. The deficit of the central and state governments reached unprecedented levels after the 1990–1991 crisis. Since then, efforts have been made to control this. Under the Fiscal Responsibility and Budget Management Act of 2003, the government intends to reduce the ratio of the gross fiscal deficit to GDP to 3%.

Trade in goods (exports plus imports) as a percentage of GDP has increased from 14.6% in 1990–1991 to 32.9% in 2005–2006. Exports have grown from 5.8% of GDP in 1990–1991 to 13.2% in 2005–2006, while imports have risen from 8.8% to 19.7% over the same period. Current account deficit has decreased over the years, showing the buoyant trade in services as well as remittances. On the other hand, foreign exchange reserves have seen a quantum jump from US\$5.8 billion in 1990–1991 to US\$151.6 billion in 2005–2006, reflecting the comfortable external position of the Indian economy.

The Indian economy also experienced a large increase in net capital flows following the introduction of reforms in the 1990s. Net capital inflows more than doubled from an average of US\$4 billion in the 1980s to an average of approximately US\$9 billion during 1993–2000. The proportion of non-debt flows in total capital flows increased from 5% in the second part of 1980s to 43% during 1990s and further to about 70% in 2000–2006. Table 8 shows the details of the division between non-debt and debt-creating flows.

As shown in Table 8, within non-debt-creating flows, the proportion of portfolio investment in total capital flows was more than 50% in 2003–2004 to 2005–2006, up from 28% in

Table 8. Composition of Capital Inflows to India

	1990– 1991	1995– 1996	1996– 1997	1997– 1998	1998– 1999	1999– 2000	2000– 2001	2003– 2004	2004– 2005	2005– 2006
Total Capital Inflows (Net) (US\$ billion)	7.1	4.1	12	9.8	8.4	10.4	10	17.3	28.6	24.2
Composition of Capital Flows (% to Total)										
1. Non-debt- creating inflows	1.5	117.5	51.3	54.8	28.6	49.7	67.8	93.7	54.6	86.1
a. Foreign direct investment	1.4	52.4	23.7	36.2	29.4	20.7	40.2	25.8	21.4	32.7
b. Portfolio investment	0.1	65.1	27.6	18.6	−0.8	29	27.6	67.9	33.2	53.7
2. Debt-creating inflows*	83.3	57.7	61.7	52.4	54.4	23.1	59.4	−6.0	35.2	37.0
3. Other capital	15.2	−75.2	−13	−7.2	17	27.2	−27.2	12.3	10.2	−23.1
4. Total (1 to 3)	100	100	100	100	100	100	100	100	100	100

*Debt-creating inflows include the following: external assistance; external commercial borrowings; short-term credit; non-resident Indian deposits; and rupee debt service.

1990–1991 to 1996–1997 and 18% in 1997–1998 to 2002–2003. This temporary drop in the 1997–1998 through 2002–2003 period was possibly due to the East Asian crisis as reflected in the data given in Table 8. The rise in the proportion of portfolio investment has also imparted increased volatility to the total capital flows, which in turn increases the volatility of the exchange rate. While the RBI has been playing an important role in the stabilization of capital flows via sterilization activities, with increased capital liberalization and global integration, India is now exposed to the volatility of foreign capital flows and, in general, that of the international financial environment.

Thus, despite the strong economic fundamentals, a sound financial architecture and active intervention by the central bank, a decade after the East Asian crisis, it is difficult to predict if India will be able to avert financial crises in the future. Due to the increase in the openness of the economy, India is now more vulnerable to external shocks than it was a decade ago. The key issue is that financial contagion is difficult to anticipate, especially since, to some extent, it depends on investor confidence, market sentiment and trust in financial markets, institutions as well as policy measures. With a change in confidence, Keynes' "animal spirits" may come into play that can make investors susceptible to herd behavior and speculative bubbles that can turn out to be self-fulfilling.

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