

The Aftermath of a Currency Collapse: How Different are Emerging Markets?

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1. INTRODUCTION

ADJUSTMENT to large macroeconomic shocks often exposes institutional weaknesses that are less apparent in more normal times. Before the oil price shocks of the 1970s, all developed countries had low unemployment, and per capita growth rates were similar across the developing world. After the oil price shocks, unemployment rates amongst developed countries varied markedly; per capita incomes in Latin America and Africa fell, but all parts of Asia continued to achieve good growth. Institutions have been a central part of the explanation for these differences (Blanchard and Wolfers, 2000; Bruno and Sachs, 1985; and Little et al., 1993).

The most obvious macroeconomic shocks of recent times have been currency crises. Previous research that is discussed in more detail in the next section suggests that the output effect of a crisis (identified by statistical criteria) is worse in high-income developing countries exposed to the international capital market ('emerging markets') than in either developed countries or low-income countries. As explained below, however, the definition of a crisis used in these studies incorporates sizeable but orderly devaluations as well as genuine crises caused by speculative pressure. In low-income countries that have only rudimentary or non-existent markets in financial securities and are relatively closed to international capital flows, devaluations tend to be rather orderly affairs motivated by current-account imbalances and/or elimination of distortions, and are not characterised by international investor panic of the kind seen in the high-profile crises of the

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last decade. To put it another way, such devaluations are essentially 'current account events' rather than 'capital account events'.

Most definitions of a currency crisis incorporate the possibility of a successful defence to a speculative attack. The macroeconomic consequences of a successful defence are likely to be very different from the consequences of an unsuccessful one. This paper analyses the response of a variety of macroeconomic indicators to a currency collapse (a crisis that culminates in a depreciation) for a series of episodes in developed countries and emerging markets over the period from 1992 to the present. Although the choice of indicators is informed by theory, no formal model is tested. The results indicate that the aftermath of a currency collapse in emerging markets, although very varied, is dramatically worse on average across a series of dimensions. The particular contribution of the paper is that it considers a wider range of macroeconomic indicators than previous studies.

2. BACKGROUND

Numerous articles have been written in recent years about particular crises, such as the European monetary system, Mexico 1994, and the Asian crisis of 1997. It is hard to draw general lessons from particular episodes, and consequently some authors have looked for empirical regularities by providing a general definition of crises based on the movement of certain variables (nominal exchange rates, international reserves) and including all episodes that fit this definition. In practice such definitions are dominated by unusually large nominal depreciations. This means that large orderly devaluations (such as that of the CFA franc in January 1994) fall within the definition.

Two studies in particular have focused on the impact of crises. Gupta et al. (2003) analyse the output effects of 195 crisis episodes across 91 developing countries over the period 1970–98, and find that only about 60 per cent have been contractionary, and the remaining 40 per cent expansionary. The output effects tend to be worse in countries with private capital flows exceeding US\$100 million annually, with larger GDP, and with fewer controls on capital flows and trade flows. Calvo and Reinhart (2000) find, for a sample of 96 currency crises in 25 developed and higher-income developing countries over the period 1970–99, that GDP growth falls by a negligible amount in developed countries between the pre-crisis year and the post-crisis year, compared with a two per cent fall in developing countries. They also find that over the same period the current account deficit (as a percentage of GDP) improves by three per cent in developing countries but by less than one per cent in industrial countries, and that developing countries are more likely to suffer a significant deterioration in credit ratings.

An 'emerging market' is usually defined as a developing country that has entered the international investment universe (in the sense that an emerging

market mutual fund is likely to hold assets from that country in its portfolio). Besides being larger, emerging markets are likely to have higher per capita incomes, more developed securities markets and more liberal capital account regimes than the average developing country.¹ The developing countries in Calvo and Reinhart's (2000) sample consist entirely of emerging markets, whereas Gupta et al.'s (2003) sample is much wider (including 42 countries from Africa).

For both sets of authors a large nominal depreciation is a major (although not the only) criterion for a currency crisis. In low-income economies with very little in the way of securities markets, a currency 'crisis', according to such a definition, is much more like an orderly devaluation than a crisis. In such economies it is very unlikely that the timing or the size of a devaluation will be determined by portfolio capital flows, as happens in the archetypal currency crisis. Crises have the potential for cumulative feedback between depreciation and investor expectations, so that the authorities lose control of the size of the eventual depreciation, whereas in orderly devaluations this is much less likely, and the expectations of international investors tend to have much less influence on the outcome.

The impact of an orderly devaluation may well be positive on balance, and is certainly likely to be much less adverse than that of a currency crisis. Rather than risk capturing many episodes of orderly devaluation by using a statistical definition of a currency collapse, this paper focuses on a sample of high-profile currency crises in the 1990s that culminated in the abandonment of the peg. Of course in some crises (e.g. in Argentina in 1995) the peg is successfully defended, and such episodes are omitted from the analysis because the macroeconomic consequences of a successful defence are likely to be rather different. The number of episodes is relatively small, but the analysis covers more dimensions of macroeconomic performance than previous studies.

3. EMPIRICAL RESULTS

Altogether twelve episodes are analysed for a sample of six developed countries (Finland, Sweden, United Kingdom, Italy, Spain and France) and six emerging markets (Mexico, Thailand, Korea, Indonesia, Russia and Brazil), focusing on the five-year period from two years before the crisis year to two years afterwards. The crisis year is defined as 1992 for all the developed countries except France (1993); as 1994 for Mexico; 1997 for Thailand, Korea and Indonesia; and

¹ For example, the FTSE Emerging Market Index consists of stocks from the following countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, Czech Republic, Hungary, Poland, Russia, Turkey, China, India, Indonesia, South Korea, Malaysia, Pakistan, Philippines, Singapore, Taiwan, Thailand, Egypt, Israel, Morocco and South Africa. Note in particular the inclusion of only one country from sub-Saharan Africa.

TABLE 1
Evolution of Macroeconomic Indicators Before and After a Crisis

	<i>Year T - 2</i>	<i>Year T - 1</i>	<i>Crisis Year T</i>	<i>Year T + 1</i>	<i>Year T + 2</i>
<i>GDP growth (per cent p.a. relative to world average for year)*</i>					
Developed countries	-0.4	-2.2	-2.5	-1.5	0.2
Emerging markets	-1.4	-1.6	-3.2	-8.5	0.1
<i>Consumer price inflation (per cent p.a.)</i>					
Developed countries	7.1	5.7	3.6	3.2	2.7
Emerging markets	16.5	8.4	9.1	29.8	14.0
<i>Cumulative change in nominal exchange rate at end-year (per cent)**</i>					
Developed countries			-12.2	-16.6	-17.2
Emerging markets			-29.0	-51.0	-53.1
<i>Current account balance (per cent of GDP)</i>					
Developed countries	-2.9	-2.4	-2.6	-0.8	0.4
Emerging markets	-4.6	-5.1	-2.2	4.9	2.9
<i>Real imports (Year T = 100)***</i>					
Developed countries	103.3	99.6	100	98.1	109.9
Emerging markets	102.2	102.2	100	78.6	89.6

Notes:

Developed country sample: Finland, Sweden, UK, Italy, Spain and France. Emerging market sample: Mexico, Thailand, Korea, Indonesia, Russia and Brazil.

* Relative to developed and developing country average respectively.

** Relative to Deutschmark for industrial countries and US dollar for developing countries (a minus sign indicates a depreciation).

*** Calculated as imports in US\$ divided by import unit values, or where unavailable by the US export price index.

For dating of crisis year see text.

Data source: *International Financial Statistics* (IMF).

1998 for Russia and Brazil (Brazil actually devalued in January 1999, but it seems more accurate to treat 1999 as the first post-crisis year). Argentina is omitted only because of insufficient post-collapse data (but all the signs are that it concords with the pattern demonstrated here).

Table 1 shows average values of some critical macroeconomic variables by country type from year $T - 2$ to year $T + 2$, counting the crisis year as year T . For GDP growth, the figures for the developed countries imply that crises are associated with recessions, as suggested by 'second-generation' models of currency crises (e.g. Masson, 1995). The recession is worst in the crisis year itself, but is also evident in the immediate pre-crisis and post-crisis years. For emerging markets, the deteriorating relative output performance in year $T - 1$ suggests that recessions play some role in precipitating crises, but the overwhelming feature is the reverse effect: output crashes in year $T + 1$, immediately after the crisis, and

the collapse is very sharp, but also short-lived. Growth recovers quickly in year $T + 2$.

The third and fourth lines of Table 1 show that currency crises failed to disturb the downward trend in inflation rates in the developed countries. In emerging markets, the picture is very different: the inflation rate in year $T + 1$ is more than 20 per cent above that in year $T - 1$, and declines only moderately in year $T + 2$.

In the case of post-crisis exchange rate depreciation, there are again major differences. The average depreciation by the end of year T is more than twice as great in the emerging markets as in the developed countries, and by the end of years $T + 1$ and $T + 2$ it is three times as large. In both cases nominal depreciation ceases, on average, by the end of year $T + 1$. For developed countries, the real depreciation would have been not far short of the 17 per cent nominal depreciation by that date (i.e. about 15 per cent). For developing countries, real depreciation peaks at about 40 per cent at the end of year $T + 1$, after which some real appreciation begins.

Given the much greater real depreciation in emerging markets, a larger correction in the current account balance is to be expected. This emerges clearly in the next two lines of Table 1. In developed countries the current account improves by 2.8 per cent of GDP on average between years $T - 1$ and $T + 2$ (but there is a further improvement, not shown in the table, of 1.2 per cent in year $T + 3$, which suggests significant adjustment lags). In emerging markets the current account improves by 10.0 per cent of GDP between years $T - 1$ and $T + 1$, before deteriorating by 2.0 per cent in year $T + 2$.

The last two lines of Table 1 show the remarkable difference in the degree of post-crisis import compression in the two groups of countries. In the developed countries, real imports fall by just over 5 per cent between years $T - 2$ and year $T + 1$, and then grow by over 11 per cent in year $T + 2$. This pattern largely reflects the behaviour of output. In emerging markets real imports fall by over 20 per cent on average in year $T + 1$, and recover only half this loss in year $T + 2$. Apart from the greater real depreciation in emerging markets, two factors are likely to account for these differences: the much bigger post-crisis output collapse in emerging markets, which would affect the demand for imported capital and intermediate goods very strongly, and shorter adjustment lags in trade flows, which are consequently more closely related to the *current* real exchange rate, rather than to a weighted average of past values.

Table 1 provides a useful picture of the differences between developed countries and emerging markets, but no more. In particular it does not tell us whether the differences are statistically significant. A formal test may be implemented by regressing the data for each country on an emerging-market dummy, a post-crisis dummy, and the product of these two. The first of these variables allows for persistent differences between country types that are unaffected by a crisis, the second captures crisis effects that are uniform across countries, and the third tests

TABLE 2
Regression Analysis of Data Summarised in Table 1

<i>Dependent Variable</i>	<i>Independent Variables</i>					
	<i>Constant</i>	<i>Emerging Markets Dummy (EM)</i>	<i>Post-crisis Dummy</i>	<i>EM Times Post-crisis Dummy</i>	<i>EM Times T + 1 Dummy</i>	
Real GDP	-0.18	3.74	1.58	-4.96		$R^2 = 0.121$
growth (per cent)	(-0.17)	(2.57)	(0.97)	(-2.16)		s.e. = 4.36
Real GDP	-0.21	3.81	1.67		-10.28	$R^2 = 0.388$
growth (per cent)	(-0.27)	(3.78)	(1.57)		(-5.58)	s.e. = 3.64
Inflation	5.45	5.85	-2.50	13.08		$R^2 = 0.265$
(per cent)	(2.00)	(1.52)	(-0.58)	(2.15)		s.e. = 11.6
Cumulative nominal depreciation			-15.33	-35.52		$R^2 = 0.640$
(per cent)			(-4.71)	(-7.73)		s.e. = 13.8
Current account balance	-2.61	-1.77	2.39	5.90		$R^2 = 0.519$
(per cent of GDP)	(-3.84)	(-1.75)	(2.22)	(3.70)		s.e. = 2.88
Real imports	101.0	0.53	3.04	-20.4		$R^2 = 8.91$
(Year T = 100)	(39.6)	(0.15)	(0.75)	(-3.59)		s.e. = 10.8

Notes:

Figures in parentheses are *t*-statistics. The post-crisis dummy takes the value 1 in years T, T + 1 and T + 2, and 0 in years T - 2 and T - 1. See also notes to Table 1.

for differences in crisis effects according to country type. In the present context it is the third dummy that is of particular interest.

Table 2 summarises the results of these regressions. The post-crisis dummy is significant only for cumulative depreciation and the current account balance. The coefficients of this dummy indicate that the nominal exchange rate was on average depreciated by 15.3 per cent for developed countries in years T + 1 and T + 2, relative to years T - 2 to T, whilst the current account balance of these countries improved by 2.4 per cent of GDP. The 'EM times post-crisis' dummy is always statistically significant at the 0.05 level, which indicates that the impact of a crisis on emerging markets is always significantly different for each of these indicators. For the average emerging market in the sample (relative to the average developed country), the crisis effect on output growth was 5.0 percentage points worse (10.3 p.p. worse if we look at year T + 1 only); the impact on inflation was 13.1 p.p. greater; the cumulative depreciation was 35.5 p.p. greater; the current account improved by 5.9 per cent of GDP more; and real imports fell by 20.4 p.p. more. Thus in every case the emerging markets were different in an adverse sense, and significantly so.

To summarise: a currency collapse causes an immediate output collapse in emerging markets, but not in developed countries. In comparison with developed

TABLE 3
Post-crisis Portfolio Capital Inflows

	<i>Year T + 1 as Per Cent of Years T - 1 and T - 2 Average</i>	<i>Year T + 2 as Per Cent of Years T - 1 and T - 2 Average</i>
Finland	95.6	86.4
Sweden	19.7	9.6
United Kingdom	191.4	226.2
Italy	331.4	159.5
Spain	336.3	-126.8
France	-68.0	31.9
<i>Average of above</i>	<i>151.1</i>	<i>64.5</i>
Mexico	-41.4	57.2
Thailand	8.8	2.0
Korea	4.3	43.8
Indonesia	-41.5	-39.3
Russia	-16.8	-114.5
Brazil	22.5	55.0
<i>Average of above</i>	<i>-10.7</i>	<i>0.7</i>
<i>t</i> -statistic [<i>p</i> -value] of difference of means between developed countries and emerging markets	2.36 [0.04]	1.11 [0.29]

Notes:

Crisis year defined as year T. Data refer to flows of portfolio investment liabilities in US dollars, n.i.e. (*International Financial Statistics* line bg.d).

countries, a currency collapse in an emerging market generates a substantial inflationary shock, considerably greater nominal and real exchange rate depreciation, a much bigger (and more sudden) current account correction, and vastly greater import compression.

A natural explanation for these differences is that the attractiveness of assets in emerging markets to international investors is particularly sensitive to a currency collapse. Table 3 provides an analysis of portfolio capital inflows before and after a crisis. In emerging markets inflows come to a sudden halt. In year T + 1 capital inflows were on average reversed, although the outflows were small, and in year T + 2 they were virtually zero. In the developed country sample, flows varied greatly but were on average no smaller after the crisis than before. This suggests that confidence in emerging markets is badly affected after a currency crisis, in a way that does not occur in developed countries. The difference in mean portfolio flows between developed countries and emerging markets is statistically significant in year T + 1, but not in year T + 2. The lack of significance in year T + 2 is not explained by a recovery in flows to emerging markets, but by smaller average flows to the developed countries.

If capital inflows come to a sudden stop, the likely reason is that investment in that country is perceived as much more risky than before. Calvo and Reinhart

TABLE 4
Differences in Crisis Effects Across Emerging Markets

Country	Change in				
	Output Growth Rate <i>T – 1 to T + 1</i> (per cent p.a.)	Inflation Rate <i>T to T + 1</i> (per cent p.a.)	Exchange Rate Year <i>T</i> (per cent)	Current Account <i>T – 1 to T + 1</i> (per cent of GDP)	Real Imports <i>T to T + 2</i> (per cent)
Mexico	–8.2	28.0	–42.0	5.2	6.7
Thailand	–9.2	2.5	–45.8	19.6	–10.4
Korea	–13.5	3.1	–50.2	17.2	4.2
Indonesia	–21.0	50.9	–48.8	6.7	–39.8
Russia	4.5	58.0	–71.1	n.a.	–23.3
Brazil	–2.5	1.7	–32.5	1.2	0.5

Notes:

See notes to Table 2.

(2000, Table 8) show that sovereign credit ratings by Moody's and Institutional Investor tend to deteriorate after currency crises in emerging markets, but not in developed countries. Moreover, *if* a ratings downgrade occurs after a crisis, in the case of emerging markets the downgrade is significantly greater as a proportion of the existing rating level.

It is important to note that the post-crisis experience of emerging markets is very far from uniform. Table 4 gives some relevant data. Whilst Mexico, Thailand, Korea and Indonesia all suffered very sharp recessions in year $T + 1$, Russia and Brazil resemble more closely the developed-country pattern of post-crisis recovery from recession (in Brazil output growth reached its minimum in year T , and accelerated considerably in year $T + 2$). Sharp accelerations of inflation were confined to Mexico, Indonesia and Russia, whilst Thailand, Korea and Brazil all managed to keep inflation rates in single figures after the crisis, despite some acceleration. These differences are not related to the size of the initial devaluation, which was over 40 per cent in all countries except Brazil (32.5 per cent). The size of the current account adjustment varied considerably, but only in Brazil was it small enough to fall within the range experienced by developed countries. Real imports fell sharply in year $T + 1$ in all countries, but by year $T + 2$ there are major differences: in Mexico, Korea and Brazil real imports were above the levels of year T , whereas in Thailand, Indonesia and Russia they were still severely depressed.

These numbers suggest that what happens in the *average* emerging market after a currency crisis is not necessarily a good guide to what will happen in any particular case. The impact on output, inflation and external sector adjustment has varied considerably from crisis to crisis. It is beyond the scope of this paper to examine this question in detail, but two factors have been widely discussed:

(a) the exposure of domestic agents' balance sheets to depreciation of the exchange rate; and (b) the policy response in its widest sense.

The problem of currency mismatches has been much discussed in the context of the Asian crisis (e.g. Corbett and Vines, 1999; and Warr, 1999). In the case of Thailand in particular, financial liberalisation encouraged foreign borrowing by banks, and although their loans to domestic investors were also in foreign currency, depreciation made many of these loans non-performing. In general a currency mismatch (with more foreign-currency liabilities than assets) exposes banks to severe losses if the peg is abandoned. If these losses create fears of insolvency, banks may anticipate a run on deposits and strongly prefer liquid assets, thus creating a credit crunch in which even good investment projects fail to get funding. Investment and output suffer as a result. The issue first surfaced in the Mexican crisis of 1994, mainly because of large-scale foreign holdings of short-term public debt indexed to the exchange rate, but also because banks borrowed in (unhedged) foreign currency to lend at home. It has arisen again in Argentina, where the authorities encouraged the dollarisation of the financial sector in order to enhance the credibility of the 1:1 peso-dollar exchange rate, so that many households and firms carried large dollar debts to the banks. Russia and Brazil stand out as the two cases where depreciation did not adversely affect banks' balance sheets, and it is noticeable that their output suffered much less after the currency collapse.

In developed countries a currency crisis does not threaten to overturn the whole policy environment. In a developing country it may well do so. In Mexico there were widespread fears that the market-oriented policy reforms of the previous few years would be reversed. Both Brazil and Argentina had prolonged experience of very high inflation before the currency peg was established, so it was natural to wonder whether there would be a return of persistent inflation after the currency collapse.

A great deal of anger and political tension is generated by the adverse impact of the crisis on many sectors of the domestic economy. Indonesia was thrown into a prolonged period of political turmoil after its currency collapse. In other countries politicians may be tempted by a populist agenda that hinders economic recovery; international investors are aware of this political uncertainty, and are unwilling to commit funds until the outcome is clearer. The sizeable international support package offered to Mexico, coordinated by the United States, can be interpreted in part as an attempt to cut short a vicious circle of economic deterioration and political instability. The IMF tried to achieve the same in the Asian crisis, but was less successful because of the size of the currency mismatches and the extent of the shock to investors' perceptions of the East Asian 'tigers'. Nevertheless, the case of Brazil shows that it is possible for developing countries to avoid many of the worst consequences of a currency collapse, in spite of a 'sudden stop' in capital flows and a sharp devaluation. By introducing a system

of inflation targeting and backing it up with appropriate fiscal policy, Brazil succeeded in avoiding both a significant inflationary shock and a catastrophic recession.

4. CONCLUSIONS

How bad are the macroeconomic consequences of a currency collapse? The analysis above shows that they tend to be much worse in emerging markets, which experience larger negative output shocks, greater acceleration of inflation, much larger nominal and real depreciations of the exchange rate, larger current account corrections and far greater import compression. In emerging markets, confidence in the general policy environment takes a huge blow after a currency crash. At home and abroad, agents become very uncertain about future inflation after the loss of the exchange rate peg, and fear that a backlash against the power of the financial markets may trigger wide-ranging policy reversals. Capital inflows dry up and inflationary expectations rise sharply. In developed countries, the adjustment is much smoother. Confidence is little affected, and the devaluation is treated as little more than a corrective relative price shift.

Nevertheless, there is tremendous variety in the post-collapse experience of emerging markets, and some did quite well by some measures. Output effects were much less severe in Russia and Brazil, whilst Thailand, Korea and Brazil all succeeded in keeping inflation low. Real imports recovered quickly in Mexico, Korea and Brazil. The only common features are the large size of the devaluations, and the big reductions in (and even reversals of) portfolio capital inflows. The size of the country, its exposure to currency mismatches, and the quality of post-collapse macroeconomic policy all affect the eventual outcome. These last two factors reflect institutional weaknesses in the regulation of the financial sector and the ability to resist the temptation to resort to seigniorage revenue. The development process is an uneven one, and an important aspect of it is the strengthening of social, political and economic institutions. The developing countries' weak scores in multi-dimensional measures of institutional quality (e.g. Knack and Keefer, 1995), and the significant positive correlation between institutional quality and growth (Bleaney and Nishiyama, 2002), are indicators of this.

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