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HOW DIFFERENT ARE EMERGING MARKETS?**

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

by

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## Abstract

In currency crises, unlike in orderly devaluations, the financial markets dominate events. It is shown that currency collapses (crises followed by depreciations) have had a much greater adverse impact in emerging markets (defined as relatively high-income developing countries exposed to international capital markets) than in developed countries. There is greater nominal and real depreciation, a substantial inflation shock, a much bigger output effect, and far greater import compression, whilst inflows of portfolio capital virtually cease. There is wide variation in the post-collapse experience of emerging markets.

JEL Nos: F31

Keywords: currency crisis, exchange rate, growth, inflation

## 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; Little *et al.*, 1993).

The most obvious macroeconomic shocks of recent times have been currency crises. Research that is discussed in more detail in the next section suggests that the output effect of a crisis is worse in high-income developing countries exposed to the international capital market (“emerging markets”) than in either developed countries or low-income countries. This implies a non-linear relationship between crisis impact and development. It is questionable, however, whether the term “crisis” is being applied in a consistent manner here across all countries. Definitions of “crisis” episodes tend to be dominated by large devaluations, but in low-income countries do such devaluations qualify as crises? Where a country is open to international capital flows, the capital account tends to dominate movements in reserves or exchange rates. In low-income countries with rudimentary or non-existent markets in financial securities, 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 last decade. It seems preferable to confine the term “currency crisis” to appropriate

episodes in countries that have reached a threshold level of development of financial markets and capital-account liberalisation.

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 1992 to 1999. 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.

## 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 in response 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 depreciations.

Two studies in particular have focused on the impact of crises. Gupta *et al.* (2001) analyse the output effects of 195 crisis episodes across 91 developing countries over the period 1970-98, and find that only about 60% have been contractionary, and the remaining 40% 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 2% fall in developing countries. They also find that over the same period the current account deficit (as a percentage of GDP) improves by 3% in developing countries but by less than 1% in industrial countries, and that developing countries are more likely to suffer a significant deterioration in credit ratings.

Define an “emerging market” 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.<sup>1</sup> The developing countries in Calvo and Reinhart’s (2000) sample consist entirely of emerging markets, whereas Gupta *et al.*’s (2001) 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. Whereas crises have the potential

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<sup>1</sup> 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,

for cumulative feedback between depreciation and investor expectations, so that the authorities lose control of the size of the eventual depreciation, in orderly devaluations, they never lose such control, and the expectations of international investors have little 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 use a statistical definition of a currency collapse that risks capturing many episodes of orderly devaluation, 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, France) and six emerging markets (Mexico, Thailand, Korea, Indonesia, Russia, 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 1998 for Russia and Brazil (Brazil actually devalued in January 1999, but it seems more accurate to treat 1999 as

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Taiwan, Thailand, Egypt, Israel, Morocco and South Africa. Note in particular the inclusion of only

the first post-crisis year). Argentina is omitted only because of insufficient post-collapse data (but all the signs are that it concurs 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 do play a 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% above that in year T-1, and only declines 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

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one country from sub-Saharan Africa.



the end of year T+1. For developed countries, the real depreciation would have been not far short of the 17% nominal depreciation by that date (i.e. about 15%). For developing countries, real depreciation peaks at about 40% 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% 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% in year T+3, which suggests significant adjustment lags). In emerging markets the current account improves by 10.0% of GDP between years T-1 and T+1, before deteriorating by 2.0% 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% between years T-2 and year T+1, and then grow by over 11% in year T+2. This pattern largely reflects the behaviour of output. In emerging markets real imports fall by over 20% 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. Evolution of macroeconomic indicators before and after a crisis

	Year T-2	Year T-1	Crisis Year T	Year T+1	Year T+2
<i>GDP growth (% 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 (% 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 (%)**</i>					
Developed countries			-12.2	-16.6	-17.2
Emerging markets			-29.0	-51.0	-53.1
<i>Current account balance (% 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, France.

Emerging market sample: Mexico, Thailand, Korea, Indonesia, Russia, 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).

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

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Table 2. Regression analysis of data summarised in Table 1

	<i>Independent variables</i>					
<i>Dependent variable</i>	Constant	Emerging markets dummy (EM)	Post-crisis dummy	EM times post-crisis dummy	EM times T+1 dummy	
Real GDP growth (%)	-0.18 (-0.17)	3.74 (2.57)	1.58 (0.97)	-4.96 (-2.16)		R <sup>2</sup> = 0.121 s.e. = 4.36
Real GDP growth (%)	-0.21 (-0.27)	3.81 (3.78)	1.67 (1.57)		-10.28 (-5.58)	R <sup>2</sup> = 0.388 s.e. = 3.64
Inflation (%)	5.45 (2.00)	5.85 (1.52)	-2.50 (-0.58)	13.08 (2.15)		R <sup>2</sup> = 0.265 s.e. = 11.6
Nominal exchange rate change (%)			-15.33 (-4.71)	-35.52 (-7.73)		R <sup>2</sup> = 0.640 s.e. = 13.8
Current Account Balance (% of GDP)	-2.61 (-3.84)	-1.77 (-1.75)	2.39 (2.22)	5.90 (3.70)		R <sup>2</sup> = 0.519 s.e. = 2.88
Real imports (Year T = 100)	101.0 (39.6)	0.53 (0.15)	3.04 (0.75)	-20.4 (-3.59)		R <sup>2</sup> = 8.91 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.

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% 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% 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% worse (10.3% worse if we look at year T+1 only); the impact on inflation was 13.1% greater; the cumulative depreciation was 35.5% greater; the current account improved by 5.9% of GDP more; and real imports fell by 20.4% more. Thus in every case the emerging markets were different in an adverse sense.

To summarise: a currency collapse causes an immediate output collapse in emerging markets, but not in developed countries. In comparison with developed 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, as is suggested by Calvo and Reinhart’s (2000) analysis of international credit ratings. 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.

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% in all countries except Brazil (32.5%). 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.

Table 3. Post-crisis portfolio capital inflows

	Year T+1 as % of Years T-1 and T-2 average	Year T+2 as % of Years T-1 and T-2 average
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>

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)

Table 4. Differences in crisis effects across emerging markets

<i>Country</i>	<i>Change in</i>				
	Output growth rate T-1 to T+1 (% p.a.)	Inflation rate T to T+1 (% p.a.)	Exchange rate Year T (%)	Current account T-1 to T+1 (% of GDP)	Real imports T to T+2 (%)
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.



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. Apart from the impact on international capital flows already discussed, two factors are of particular importance: (a) the exposure of domestic agents' balance sheets to depreciation of the exchange rate; and (b) the loss of the external nominal anchor.

The problem of currency mismatches has been much discussed in the context of the Asian crisis (e.g. Corbett and Vines, 1999; 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 exposes banks to severe losses if the peg is abandoned. If these losses create fears of insolvency, banks may fear an information-based run and strongly prefer liquid assets, thus creating a credit crunch in which even good investment projects fail to get funding. 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 of banks borrowing in (unhedged) foreign currency to lend at home. It has arisen again in Argentina, a highly dollarised economy in which much household debt is denominated in dollars. Russia and Brazil stand out as the two cases where depreciation did not adversely affect banks' balance sheets, and it is probably not coincidental that they suffered much less of an output collapse than the other countries.

In developed countries the exchange rate regime has little relevance to the inflation rate. In the developing world there is evidence that it does: over the past quarter of a century developing countries with floating exchange rates have experienced annual inflation rates about ten percentage points higher, on average, than those with pegged exchange rates (Bleaney, 1999; Ghosh *et al.*, 1995). “Hard” pegs with greater constraints on devaluation, such as currency boards or the CFA arrangement, are characterised by particularly low inflation (Bleaney and Fielding, 2002; Ghosh *et al.*, 2000). There is still room for doubt about the possible endogeneity of exchange rate regimes in these tests, but nevertheless the results suggest that, without external constraints, the monetary authorities in developing countries have a tendency to regard price stability as a low-priority objective, either because they are unwilling to sacrifice growth, even temporarily, to achieve it, or because of the fiscal need for seigniorage revenue. Consequently, an unexpected currency crash that removes the external nominal anchor creates a vacuum in monetary policy which, unless it is filled decisively and effectively, results in a rapid increase in inflationary expectations. The increase in inflationary expectations then helps to drive down the nominal exchange rate further. Some countries have successfully avoided this vicious circle – in Brazil, for example, the authorities were able to fill the vacuum immediately by announcing a system of inflation targeting – but others have not.

#### 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 external nominal anchor, 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 (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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