

## ***Reflections on Currency Crises***

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In the 1990s, currency crises have increasingly become a common occurrence around the world. Speculative attacks on currency wreaked havoc in the European Monetary System in 1992-1993, in Mexico and Latin America in 1994-1995, in East Asia in 1997-1998, in Russia in 1998, in Brazil in 1999, and in Argentina and Turkey in 2000-2001. Many of these episodes of financial turmoil came as a surprise at the time and had the effect of transforming the thinking about currency crises in the literature to such an extent that, it has now become commonplace to talk about different generations of currency crisis models. In each of the successive *generations* a different question or set of questions seem to have been at the center of discussion as attention has shifted to an issue that appeared novel at the time of the last crisis. But it was never clear if the earlier focal questions —at least certain aspects of them— ceased to be relevant. It was as though a new layer of determination simply superimposed itself on those that came before.

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Here, it is argued that currency crises can be analyzed at different levels that correspond to these different layers of determination. Looking at it at the national level, these crises can be seen to signify the pitfalls of betting on financial liberalization to attract foreign capital on a massive scale. Quite often developing countries got themselves into a serious debt problem after they liberalized. Depending on whether and what type of foreign capital came in, the bulk of the debt that piled up has been internal or external and accumulated in either the private or the public sector. But, invariably, the crisis hit when financial imbalances caused by excessive debt, in this or that form, finally led to an implosion. Looked at the level of the international monetary system, many of these crises are caused by a new breed of speculative attacks that have beleaguered global financial markets in recent times where expectations tend to become self-fulfilling prophecies. At this level, abrupt reversals of capital flows caused by so-called contagion effects expressing capricious shifts of investor sentiment, emerge as the main problem. Finally, these crises can also be looked at the structural context of international trade and the world economy. Arguably, many developing countries today face the threat of 'immiserizing growth' reflecting the fallacy of composition problem inherent in a generalized strategy of export-led growth. At this level, the steady erosion some developing countries have experienced in their terms of trade *vis a vis* their richer trading partners in the last two decades can be seen as the deeper source of their currency troubles.

These different levels of analysis roughly overlap with the main issues that were emphasized by different generations of currency crisis models. Below, following a brief overview of different crisis models, I outline three questions that reflect the different layers of determination mentioned above. The following sections of the paper are organized around these questions.

### **BRIEF OVERVIEW**

In the 1980s, currency crises were thought to be predictable. Traditional view, shaped by the experiences of some Latin American countries in that

decade, held that countries ran into crisis when they monetized rising fiscal deficits, causing a steady erosion in their foreign exchange reserves. Once the decline in reserves falls below some critical threshold a speculative attack ensues on the fixed exchange rate (Krugman, 1979).<sup>1</sup> Prior to the attack, these countries would experience rising prices, real exchange rate appreciation and an increasing current account deficit, all of which were thought to be the harbingers of the coming currency crisis.

However, the currency crises of 1990s seemed different in nature. In the European crisis of 1992-1993, it was argued that the root source of the problem was the conflict speculators perceived between the fixed parity and the change of direction in macroeconomic policy that appeared likely in the light of unexpected economic developments. Speculators attacked currencies once they began to think that countries in question could gain more from abandoning the fixed parity than defending them. Governments ended up *ratifying* these speculative attacks by changing course, even though their original policies would have been perfectly viable had it not been for the attack on the currency. In the academic literature, these crises gave rise to the so-called second generation models, which emphasized new themes such as multiple equilibria, self-fulfilling nature of speculators' expectations and governments' utility functions.<sup>2</sup>

However, neither these second nor the first generation models seemed to explain the main dynamics of the "tequila" crisis in Latin America (1994-1995), and especially the East Asian crisis (1997-1998). While some economists such as Edwards (1996) held that the main problem in the Mexican crisis was the unsustainable increase in aggregate demand, just as had been in the earlier Latin American crises, others (e.g., Gil-Diaz and Carstens, 1996) argued that the crisis was basically a self-fulfilling run on the currency triggered by an array of unexpected foreign and domestic shocks. But, if the Mexican crisis was a borderline case, the

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<sup>1</sup> See also Flood and Garber (1984).

<sup>2</sup> Obstfeld (1994) is considered the classic example of this class of models. See also Eichengreen *et al.* (1997).

Asian crisis clearly was not. The first generation models did not fit the bill since none of the countries involved had any budget deficits of any significance. The second-generation models also fell short, because in these economies currency crises were followed by severe recessions rather than an output expansion, as had been the case in Europe.<sup>3</sup>

The Asian crisis has so far given rise to two main competing explanations.<sup>4</sup> According to one, the governments in South East Asia, though not overspenders themselves, were still the cause of private sector profligacy by their misguided interventions in the economy. Through their actions they created moral hazard problems, which in turn led to the emergence of an unsustainable economic bubble in the region. Because they gave sweeping guarantees to large corporations and underwrote much of the banking sector in the name of industrial policy, businesses went on a reckless binge of over-investment, knowing well that their governments would never let them go under. Thus, at closer inspection, the East Asian crisis was not all that different from the earlier first generation type crises. In both, government misdeeds, though in different forms, have created market distortions and that had been the real cause of the crisis.

According to the other view, the main cause of the crisis was financial panic that was caused by irrational herd behavior on the part of international investors. Thus, the crisis had little to do with problems in the real economy nor with inconsistent economic policies. The East Asian crisis, if anything, showed that the financial markets could not be left to their own devices, and that in the absence of institutional anchors they have a propensity to self-destruct. Self-fulfilling expectations giving rise to abrupt and unpredictable reversals in capital flows with dire consequences, this view held, is a hallmark of fully liberalized financial markets.

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<sup>3</sup> The conventional view holds that real economic activity has improved in Europe following devaluation in 1992. For an argument that questions this view, see Gordon (2000).

<sup>4</sup> For an alternative view that stresses of the problem of worldwide over-capacity and the fallacy of composition problem inherent in export promotion, see Erturk (2001-2002).

Though the literature on currency crises is still in a state of flux, widespread evidence of contagion effects from around the world seems to have nudged the weight of opinion towards the view of self-fulfilling financial panic in recent years (Krugman, 2000). The view that financial markets cannot be left to their own devices is perhaps gaining predominance across a wide spectrum of opinion, even among some of the market faithful.

Yet, notwithstanding its rising intellectual stock, the financial panic thesis does not address a number of pertinent questions as well. Foremost among them is perhaps the question as to why the decline in output was so severe in East Asia. On the basis of conventional theory one would expect devaluations to have an expansionary effect, and that is indeed what seems to have happened in Europe after its crisis, but much of the evidence from East Asia was either mixed or contradictory.

In some recent papers that comprise the “third generation” models in Krugman’s (2000) classification this question has come up, though only indirectly since their main focus has been the appropriate policy response in the aftermath of a crisis. For instance, questioning the wisdom of tight monetary and fiscal policy, Aghion *et al.* (2000, 2001) and Krugman (1999) focus on the adverse effects of devaluations due to problems caused by currency mismatch on the balance sheets of domestic firms that are credit constrained.<sup>5</sup> As firms’ wealth and access to credit declines with devaluation, not only aggregate investment expenditures fall but also firms cannot even utilize their capacity that is already in place to exploit the lucrative export opportunities that emerge after devaluation. Thus, if firms are highly indebted in terms of foreign currency, tight monetary policy can possibly be helpful to the extend that it succeeds in bolstering the value of the currency, but a contractionary fiscal stance is unambiguously harmful, increasing the likelihood that the economy gets bogged down in a *bad* equilibrium.

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<sup>5</sup> In some other papers, the focus has been on problems caused by maturity mismatch rather than currency mismatch (Chang and Velasco, 1999).

However, deeper and longer-term problems might be the more serious obstacles export firms in developing countries face today than the difficulty of raising sufficient working capital to increase output following devaluation. Especially within the last decade, the competition these firms face from each other has been stiffening in part because an ever-increasing number of them from around the world are trying to sell similar goods to the same markets that are stagnant. Thus, the *beggar thy neighbor* aspect of developing country devaluations might be the more relevant context in which the question needs to be posed.

### WHAT ARE THE QUESTIONS?

In the first generation models, along with asset price bubbles and appreciation of real exchange rates, an unsustainable economic expansion that gives rise to an ever-increasing current account deficit is the main issue that is emphasized. Notwithstanding the vast differences among countries that have experienced currency crises, it might be safe to suggest that one tends to observe in all of them a *boom and bust* cycle that culminates in crisis. That common denominator defines our first question.

If currency crises changed in nature in the 1990s and became truly unpredictable as suggested, then, an analysis of the causes of the boom and bust cycle in itself might not be sufficient for a satisfactory understanding of currency crises. Indeed, in the second-generation models, expectations' relative autonomy from the "real economy" and their self-fulfilling nature have become the main issues emphasized. In this literature, the discussion has shifted onto financial ratios of various kinds from current account deficits or over appreciation of currencies as the possible indicators of a coming crisis. That change motivates our second question.

In the third generation models, the focal question becomes what must be the fiscal and monetary policy response to a speculative attack. Though the policy discussion is outside the confines of this paper, another issue that is indirectly raised in these models touches upon our third question:

What real-economy complications might account for output contraction after currency crises.

To reiterate then, the rest of the discussion is organized around the following three questions.

- i. What causes the boom and bust cycle that gives rise to the economic bubble?
- ii. What are the different dynamics that can trigger self-fulfilling expectations to cascade in a *perverse* way culminating in currency meltdowns?
- iii. What real-economy forces might exacerbate currency troubles inhibiting the output responsiveness of developing countries to currency devaluations

### **Boom and Bust Cycles**

As it has been mentioned above, first generation models originate from Krugman (1979), according to which the cause of “excessive” economic expansion is the ever-rising budget deficits. It is thought that the model captures theoretically the essential aspects of the crises experienced in Southern Cone countries in the late 1970s and early 1980s. However, this is questionable.

Because these countries had been trying to bring down inflation at the time they ran into crises, their experiences have also been a subject of study in the context of discussions around ‘disinflation’ programs. Interestingly, in this literature that focuses on the historical experiences of these countries in detail lax public finance is hardly the central issue. Likewise, the individual case studies that focus on these countries share the same conclusion with respect to the importance, or rather the lack thereof, of excessive public spending (Taylor, 1999, 2001). Instead, the boom and bust cycle is mainly attributed in these works and in the disinflation literature to other causes. Before I turn to these, however, a brief overview of the disinflation programs that were being implemented at the time will be useful.

The particular type of stabilization programs that was used in the Southern Cone countries in the late 1970s was the first of its kind in two

respects. Firstly, disinflation was being attempted for the first time in context of a liberalized capital account. Secondly, in these programs the nominal exchange rate functioned as an anchor. This was based on the notion that belt tightening was not enough in itself in bringing down the inertial part of inflation. That, it was thought, required the use of a nominal anchor in the design of the stabilization program. In later years, many other countries in different parts of the world chose to use repeatedly their exchange rate as the nominal anchor in their disinflation programs, in part because the two other alternatives, tight monetary or incomes policy, are much harder to implement politically.

The main objective of these programs has been to reduce domestic inflation by decreasing incrementally the rate of devaluation, but in many countries the failure of inflation to fall in tandem has led to the real appreciation of currency. Despite the fact that this was thought to have a contractionary effect since it would reduce net exports, the result was almost invariably a consumption led boom that eventually went bust in a few years. For instance, in Chile and Argentina, where these type of programs were first implemented, the real appreciation of currency went hand in hand with a 14% increase in private consumption within a year the program had been implemented, while the GDP rose by 8 and 10 percent, respectively, in these two countries during the same time span. With such rapid expansion of output, it was not long before the current account deficits began to balloon as well, reaching for instance as high a ratio as 14 percent of GDP in Chile within two years (Calvo and Vegh, 1999). In the 1990s, the same pattern has repeated itself in other countries. Many anti-inflation programs around the world, in which the exchange rate was the nominal anchor, (*e.g.*, Mexico, 1994; Russia, 1998; Brazil 1999, and Turkey, 2001) ended in crisis as well (Mussa *et al.*, 2000). In all these episodes, a private consumption led boom that went bust was the main common trait.<sup>6</sup>

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<sup>6</sup> Until the Argentinean crisis, the official prescription for avoiding a currency crisis was a bit of contractionary fiscal policy and a timely exit from the crawling peg

Two arguments made in the literature in the 1980s in explaining these boom and bust cycles emphasized the discrepancy in the speeds with which rate of devaluation and inflation declined. According to the first view, the very credibility of the disinflation program brings down the expected rate of devaluation, which in turn leads to a fall in the domestic nominal interest rate in line with the uncovered interest rate parity condition. The real rate of interest falls more than the decrease in the nominal interest rate because the decline in the rate of inflation lags behind (Rodriguez, 1982). Moreover, the real wages might also be rising, since the decline in inflation, though not as fast as the decrease in the rate of devaluation, might be faster than the decrease in the rate by which nominal wages continue to rise. Thus, falling real interest rates, coupled possibly with rising real wages are thought to give rise to a consumption led boom in output. Over time, the contractionary effects of rising current account deficits and real currency appreciation turn this boom into a bust. In the meantime, depending on the level of foreign exchange reserves and a host of other factors there might be an attack on the exchange rate and a currency meltdown.

The second view argues that the rapid increase in private consumption is caused by the disinflation program's lack of credibility in the eyes of consumers. Because people do not think that the fall in inflation will be permanent they increase their expenditures especially on big ticket consumption items and expensive imports with the idea of buying what they can before inflation begins to go back up (Kiguel and Liviatan, 1992; Calvo and Vegh, 1999).

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arrangement into either a hard peg or a fully floating exchange rate arrangement—the so-called bipolarization thesis. The Turkish crisis of 2001, the IMF seemed to argue, was yet another evidence of the validity of the bipolarization view that nothing in between a hard peg and full float worked (Fisher, 2001). As the crisis in Argentina swerved out of control, however, the bipolar view has quietly receded into the background, and the official line became float, float, float! Interestingly, evidence suggests that few of the countries that are thought to be floaters are actually 'dirty floats' at best (Calvo and Reinhart, 2000).

A third argument, most commonly associated with Lance Taylor (1998), is similar to the first one except here the dynamics of capital flows play a more central role. Depending on the degree of emphasis one places on the moral hazard problem, it can be said to come in two versions. According to Taylor, the adoption of a credible disinflation program reduces the expected rate of devaluation just as Rodriguez (1982) had argued. But, Taylor holds that the fall in the nominal rate of interest is usually less than the decrease in the expected rate of devaluation, giving rise to an interest rate spread which fuels a steady capital inflow. This in turn causes either the domestic money supply to increase right away, or, if the central bank sterilizes, a further increase in the domestic interest rate and thus an even higher interest rate spread which only stimulates more capital inflow. Thus, sooner or later the capital inflow leads to rising domestic money supply, causing asset and commodity prices to swell up and the real exchange rate to appreciate. Current account deficit begins to rise, causing past a certain threshold the devaluation risk to increase. Maintaining the same interest rate spread, and thus the capital inflow, now requires that the domestic nominal interest rate is increased. That begins to slow down, and eventually reverses, the economic expansion. In the meantime, the rising current account deficit at some point exceeds the capital inflow, causing a decline in foreign exchange reserves, raising the devaluation risk anew.

The second version of this argument adds on a dimension of moral hazard. If one is to eschew a monetarist approach, which incidentally Taylor does, it is not completely clear how rising money supply causes prices and output to increase in the above scenario. One obvious way of explaining the connection is by recourse to bank credit. Capital inflow induces domestic banks to raise the domestic volume of credit they supply, which in turn raises both the money supply on the one hand and prices and output on the other. As long as the real exchange rate continues to rise, banks can indeed make easy profits by lending inside what they borrow from outside. This however implies that banks simply ignore the devaluation risk and the possibility that the trend of real appreciation of

currency can reverse itself. Indeed, as the proponents of the moral hazard argument has emphasized that the *open* positions banks took in many of the East Asian countries have created a financially fragile environment and thereby set the stage for the crisis, if not caused it.

Though moral hazard is some part of the story, as Taylor remarks, it would be highly misleading to conclude that it is the main explanation of the crisis. In fact, it is quite possible to explain banks' destabilizing credit behavior without recourse to the moral hazard argument at all. This alternative account rests on a consideration of the macroeconomic implications of foreign exchange deposits offered by domestic banks in developing countries that have liberalized their financial system. Rather than thinking of these deposits as some auxiliary part of the global supply of, say, us dollars, it is more meaningful to think of them as the inactive part of the domestic money supply. Under the conditions of increased uncertainty created by globalized finance, in many of the so-called emerging markets these foreign exchange denominated deposits with domestic banks have begun to supplant traditional saving or time deposit accounts in terms of domestic currency, and that in turn seems to have created a built-in macroeconomic destabilizer.

Any change in liquidity preference causes bank deposits to shift back and forth between active circulation—accounts denominated in local currency—and inactive circulation, comprising foreign exchange denominated accounts in the same set of banks. Because the reserve requirements are invariably much higher in the latter than those in the former, these shifts have a destabilizing effect. Thus, any increase in liquidity preference during a period of economic slowdown and increased economic uncertainty redistributes deposits within the banking system from low-reserve to high-reserve accounts, reducing banks' liquidity and thus their ability to extend credit. Likewise, during a period when liquidity preference declines throughout the economy banks become awash with liquidity and thus experience an increased ability to lend. In other words, in addition to the contractionary (expansionary) effect of a rise (fall) in liquidity preference itself, the resultant change in the liquidity situation of banks becomes yet another force that propels the economy in the same direction.

In contrast, *stability* requires that the reserve requirement on accounts that traditionally make up the active circulation (checking accounts) are higher than those for saving accounts and time deposits that used to constitute squarely the bulk of inactive money supply prior to financial liberalization in countries like the US. In this instance, any redistribution of deposits within the banking system that results from shifts in liquidity preference is stabilizing. A fall (rise) in liquidity preference which is associated with increased (decreased) business buoyancy has, *ceteris paribus*, the effect of reducing (raising) banks' liquidity and thus checking the economic expansion (contraction).

Moreover, in addition to their destabilizing effect in developing countries, the foreign exchange denominated bank deposits become the vehicle through which liquidity preference and currency substitution become intertwined. As discussed in the next section, this implies that anything that might cause an abrupt increase in liquidity preference can possibly trigger a currency crisis as well.

### **What are the Trigger Mechanisms?**

In the first generation models, it is argued that financial markets punish those countries whose economic policies are internally inconsistent. According to this view, speculative attacks follow when speculators' recognize that the economic policies that are being implemented cannot be sustained in the long run. By contrast, in the second-generation models, speculative attacks are supposedly triggered by just the *probability*, rather than the *existence*, of internal inconsistencies in economic policies. Thus, expectations become self-fulfilling prophecies.

Under conditions of capital account liberalization, the exchange rate is indeed just another asset price that can be subject to speculation. Thus, just like any other forward looking asset price, rumors, noise and investor sentiment, at least in the short run, are likely to be more important than what is happening in the real economy. While the possibility of contagion effects that reflect abrupt shifts in investor sentiment are by now well

recognized, the same cannot be said for the more tractable dynamics of speculative finance.

In order to discuss what the latter entails, it is useful to express the uncovered interest rate parity condition in the following way. The said condition, as written below, simply states that the difference between the domestic nominal interest rate and the international interest rate must be equal to the sum of the devaluation risk (DR) and the country (or sovereign) risk (SR).

$$i - i^* = \text{DR} + \text{SR} \quad [1]$$

where  $i$  is the domestic nominal interest rate and  $i^*$  the international interest rate.

The devaluation risk in turn can be decomposed into two components: a major devaluation risk (MD) and exchange rate drift (ERD), which entails relatively predictable incremental changes in the peg. In a fixed exchange rate regime ERD is insignificant or zero while MD is positive; and in the case of floating regime it is exactly the opposite: ERD is significant while MD is zero or negligible.

Again, in order to facilitate the discussion below, the change in foreign exchange reserves can be expressed as the sum of the current and capital accounts;

$$\Delta F = T(Y, E) + C(i, i^*) \quad [2]$$

where  $T$  is trade balance,  $Y$  is output,  $E$  the real exchange rate (where an increase means a fall in the value of the domestic currency). In keeping with the assumptions traditionally made with respect to the signs of the partial derivatives, it is assumed that,  $T_Y < 0$ ,  $T_E > 0$  and  $C_i > 0$ , holding  $i^*$ , DR and SR constant.

In Taylor's argument discussed above, the first equality turns into an inequality once a credible stabilization program is adopted in a developing country. The interest rate differential on the left hand side exceeds the

sum of SR and DR, and the greater the interest rate spread the higher is the magnitude of capital inflow. After awhile with the expansion of output and real exchange rate appreciation the trade deficit begins to balloon, and that over time causes DR to increase. Under these circumstances, maintaining a positive interest rate spread requires that the domestic interest rate has to keep rising. At some point, reserves of foreign exchange also begin to fall as the capital inflow falls short of the rising current account deficit, causing a further increase in DR. Because the domestic interest rate cannot be increased indefinitely, the decrease in the foreign exchange reserves past a threshold can no longer be reversed by raising the domestic interest rate. This is the beginning of the end, and once reserves begin to fall steadily the actual mechanism of the speculative attack need not be different from Krugman's (1979) account.

The experience of the 1990s suggest that the crises in this decade were mainly capital account driven rather than current account driven scenario discussed above. It appears that dynamics of speculative finance rather than ballooning current account deficits was the main culprit that was responsible for the initial increase in the real exchange rate risk, culminating in the eventual reversal of the interest rate spread.

To see how this might have worked, it is instructive to explicitly introduce asset price expectations into the interest parity condition in equation [1] where they are ignored. One simple way in which this can be done is by defining the real exchange rate risk (ER) as the difference between the devaluation risk (DR) and the expected increase in asset prices ( $\Delta AP^e$ ),

$$ER = DR - \Delta AP^e, \quad [3]$$

and rewriting equation [1] as,

$$i - i^* = ER + SR \quad [4]$$

Now, if we revisit to the above discussion, again, starting with the adoption of a credible stabilization program, the real exchange rate risk falls, giving rise to a positive spread. Not only does the expected devaluation rate decrease,

but also the expected change in domestic asset prices becomes positive as it is expected that the implementation of the stabilization program will push down the nominal interest rate in the near future.

Now, what is different in this case is that  $ER$  begins to rise as soon as the expected increase in asset prices peters out. As an increasing number of speculators begin to believe that asset prices have peaked, the *bear* position—in the sense Keynes used the term in his *Treatise on Money*—begins to rise. This might mean that foreign hedge fund managers simply close their positions in that country and move elsewhere, or that there might just be a flight to liquidity. But, because the *bear* position in developing countries that have gone through financial liberalization takes the form predominantly of foreign exchange deposits in local banks, in either case there is pressure on the exchange rate. With an unexpected weakness in the value of the home currency, or a slowdown at the rate with which the devaluation rate has been decreasing, the market confidence in the stabilization program falters and  $DR$  in equation [4] increases abruptly. In other words, decreasing expected increases in asset prices causes liquidity preference to increase, and that in turn through currency substitution or capital outflow puts pressure on the nominal exchange rate, raising  $DR$ .<sup>7</sup> Thus,  $ER$  rises on account of both the initial fall in the expected asset price increases and the eventual rise in devaluation risk.

With  $ER$  rising, just as in Taylor's account above the country in question has no choice but to raise its nominal interest rate. Again, the high interest rate policy is ineffective in keeping the interest rate spread positive in [4]. Except now, the high interest rate policy backfires much faster.<sup>8</sup> First, to the extent that rising interest rates signal negative asset price changes ahead to financial investors, they cause a net outflow rather than an inflow of capital. In other words, in the stylized world of the Mundell-Flemming model, the

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<sup>7</sup> In fact, any increase in liquidity preference for any other reason can possibly have the same effect.

<sup>8</sup> On how high interest rate policies backfire, see Lane *et al.* (1999), and Bensaid and Jeanne (1997).

partial derivative of capital account balance with respect to the interest rate in equation [2] above turns negative ( $C_i < 0$ ), at least within a certain range, which implies that the increase in the difference between the domestic and foreign rates of interest,  $i - i^*$ , is more than balanced by a rise in  $ER$ . The capital outflow can perhaps be temporarily kept in check by pushing up the domestic interest rate to astronomically high levels. But, then it is highly probable that such high interest rates cause the sovereign risk (sr) to shoot up in a short span of time by instigating either bank failures or a domestic debt crisis or both. Banks are likely to default on their debts to foreign creditors as the value of the government bonds in their hands evaporates and the reversal of the trend of real currency appreciation catches them off guard with open positions; and at exorbitantly high interest rates it does not take very long before the public debt begins to look out of control. Once the sovereign risk begins to rise a point is soon reached where no interest rate increase, no matter how big, can stem the outflow of capital and a severe meltdown in the value of the domestic currency becomes inevitable.

Moreover, in more general terms it can be remarked that whatever the merits of a strict anti-inflationary stance, self-imposed by some international agreement, in reducing the devaluation risk in a developing country it is likely that there is a price to pay in terms of a higher sovereign risk. For instance, once a country with a large stock of internal debt forgoes its ability to inflate its debt by agreeing to the IMF's demand that its central bank function as a currency board, the default risk on this debt and thus the sovereign risk is likely to go up.<sup>9</sup>

### **Real-Economy Causes?**

While theoretically it is well recognized that adverse shifts in terms trade lead to current account deficits (Harberger, 1950; Laursen and Metzler,

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<sup>9</sup> McKinnon (1994) explains in a similar vein why the risk premium on Italian and Spanish debt had increased after the Maastricht Treaty as the member countries in the Europe Union have effectively gave up their ability to inflate their debt. See also Vives (2002).

1950), the role deteriorating terms of trade might have played in recent currency crises have not been sufficiently studied. This is important given the fact that non-oil commodity prices have steadily fallen and exhibited greater volatility since the mid-1970s (Reinhart and Vicham, 1994). On theoretical grounds, as Singer (1950) and Prebisch (1950) have warned long ago, a development strategy based on the export of income inelastic goods is expected to lead to a deteriorating terms of trade. Indeed, the price of not only primary goods but also developing country manufacturing exports have been falling steadily since the early 1980s in relation to developed country exports of machinery, transport equipment, and services (figure 1).<sup>10</sup>

It is also well-recognized that within a given region the parallel export expansion of cheap exports collectively facing less than infinitely elastic world demand can give rise to ‘immiserizing growth’ (Bhagwati’s, 1958). That is, with export expansion the barter terms of trade could fall to such an extent that per capita income would diminish or remain stagnant as economic activity increased. For instance, between 1996 and 1998, Korea’s export revenue in US dollars rose only by 2% while the volume of its exports increased by 38% (Erturk, 2001-2002).<sup>11</sup> Likewise, the 1998 US import bill for all non-oil imports from “East Asia” (Hong Kong, Indonesia, Korea, Singapore, Taiwan, and Thailand combined), which amounted to \$107.9 billion, would have been equal to \$143 billion in 1996 prices (Barth and Dinmore, 1999).

The connection between deteriorating terms of trade and currency crises can perhaps be conceptualized in the context of Kaldor’s “two-sector world economy” framework. Accordingly, advanced and newly industrializing countries (NICS) can be thought of producing respectively *smart* and *dumb chips*, instead of manufacturing versus primary goods.

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<sup>10</sup> See also Maizels *et al.* (1998); Sapsford and Singer (1999); Sarkar and Singer (1991).

<sup>11</sup> See the same article for a discussion of the role deteriorating terms of trade has played in the East Asian crisis.

In this setting, advanced countries are assumed to import from NICS standardized, lower technology “commoditized” inputs (dumb chips), while the NICS buy high tech goods (smart chips) as capital inputs from advanced countries. Assuming balanced trade, a balance condition holds for the respective growth rates in the two regions. For ease of exposition, the two growth rates can be assumed equal when in balance.

**FIGURE 1**  
*Price of Developing-Country Manufactured Exports,  
 Relative to Developed Country Exports of Machinery,  
 Transport Equipment, and Services, 1975-1995*  
 (index: 1980 = 100)



Source: Wood (1997).

In figure 2, the growth rate of high tech goods in the advanced countries is related positively, and that of low tech goods negatively, to the price ratio of high tech goods over low tech goods, expressed in the currency of the advanced country’s unit of currency. The point at which the two

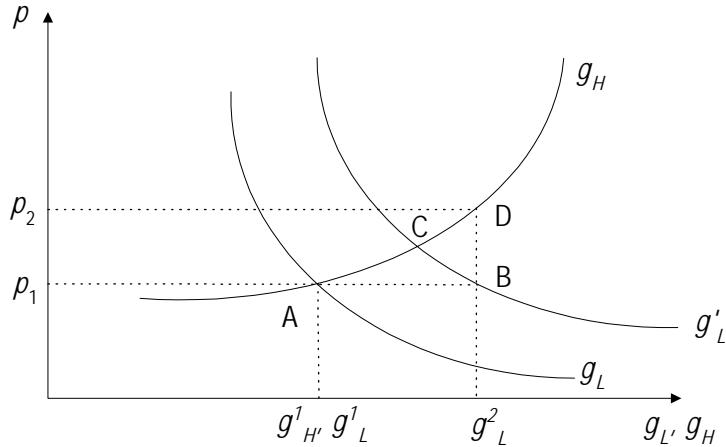
schedules intersect at point *A* gives the price ratio ( $p$ ) for which the two growth rates are in balance. In the absence of capital flows, this equilibrium point is stable. If the price ratio is higher than its ‘equilibrium’ value the production of high tech. goods grow faster than that of low tech goods, giving rise to an excess supply of high tech goods which pushes down the relative price of high tech goods in terms of low tech goods. Likewise, if the  $p$  is less than its equilibrium value, the price ratio is pushed up by an excess supply of low tech goods. However, free capital flows can be seen to prevent such smooth adjustment.

The flow of capital into developing countries from advanced countries can be thought to have two separate effects. On the one hand, it facilitates capacity investment and the adoption of new technology, causing the growth rate schedule for low tech goods to shift up, and, on the other, for the reasons discussed earlier it causes the real exchange rate of NICS to appreciate preventing a smooth upward adjustment in relative prices in terms of the advanced country currency.<sup>12</sup> Thus, rather than smoothly moving to the new equilibrium point at *C*, our stylized world economy ends up at *B*, *i.e.*, indicating a global overaccumulation of low tech. goods. The higher growth rate in the *South* fails to generate a smooth price response that can correct the imbalance in the growth rates, and, in the long run, the problem only gets worse. The capital inflow might still continue as profitability in the export sectors diminish, feeding speculation and investment in the non-tradable sectors. Asset price inflation makes a smooth depreciation of the currency all the more unlikely and difficult, setting the stage for an eventual collapse in the exchange rate as discussed in the previous section. With the meltdown of currency the relative price of low tech goods falls drastically, which in our diagram can be shown as an abrupt jump from point *B* to *D*.

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<sup>12</sup> For ease of exposition, it is assumed that currency appreciation is just sufficient to balance the fall in terms of trade, such that the price ratio in the advanced country currency remains constant.

FIGURE 2



The point of IMF's tight monetary policy after the crisis was arguably to bring about an upward shift in the growth schedule for low tech. goods (thus moving point *C* closer to *D*) by means of restoring investor confidence to resume the capital inflow into the region. However, the result instead has been deflation and destruction of capacity, which can be thought to have involved a downward shift in the low tech growth schedule, increasing the magnitude of imbalance at point *D*. Incidentally, in the advanced countries the higher growth rate, which the jump to point *D* implies in our diagram, is fuelled by the deflationary trend in the NICS. However, point *D* implies overaccumulation of high tech goods, implying economic trouble down the line for the developed countries as well.

## CONCLUSION

The objective here has been to contribute to our understanding of currency crises as a prelude to a discussion of policy, which has been out of the scope of this paper. However, it might be useful in concluding to point to

a few new policy themes that can emerge from the above discussion. With respect to the question of what to do to prevent boom and bust cycles that lead crises at the national level, the policy prescriptions offered depend on whether one accepts the main contention of the mainstream first generation models according to which speculators are seen to punish the policy mistakes of governments. In addition to the various remedies already suggested by those who share the critical stance of this paper towards the mainstream view such as imposing one or another form of capital control, a new theme that follows from the discussion here points to the destabilizing effect of foreign exchange deposits in domestic banks. Some form of market segmentation among banks or imposing higher transaction costs involving shifts between deposits denominated in domestic and foreign currency can be among the remedies that can be fashioned to address this problem. This is also an issue that carries over to the second level of analysis involving the perverse financial dynamics that emerge from self fulfilling expectations. For failure to separate effectively the instruments of liquidity preference from currency substitution is wrought with danger, and can in fact be the very trigger of currency crises under certain conditions. Moreover, the discussion in this section also highlights the pitfalls of implementing a disinflation program with a crawling peg under conditions of a liberalized capital account, as it provides speculators with sure one-sided bets.

Finally, at the third layer of determination, neither the boom and bust cycle nor abrupt reversals in capital flows appear as the ultimate cause of currency crises. The exporters in developing countries still suffer from a steady deterioration in their terms of trade as a smooth adjustment to point *C* in figure 2 indicates, even in the absence of reversals in capital flows and a currency meltdown. As more and more countries for low tech goods crowd the lower rungs of entry into international markets (and the growth schedule for low tech continue to shift up) the tendency of a falling terms of trade is likely to get worse and its deleterious effects progressively harder to escape. As Kaplinsky (2000) puts it, developing countries trying to succeed in late industrialization will have to “run

faster and harder" in order to overcome the disadvantages of a continuously tilting playing field. If indeed this is the nature of the underlying problem developing countries face, an effective remedy at this level will require nothing less than establishing networks of regional cooperation and economic integration. In this context, the *Asian Monetary Fund* that was proposed by the Japanese in the midst of the crisis in August 1997, and vehemently opposed by the US and the IMF at the time, was perhaps a missed opportunity; and, a production cartel would have been a more effective way to restore growth in the region than the competitive scramble in which each country tried to export its way out of the crisis with mediocre results at best.

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