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MARKETS: THE LESSONS FROM 1995

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ABSTRACT

In this paper we examine closely the financial events following the Mexican peso devaluation to uncover new lessons about the nature of financial crises. We explore the question of why, during 1995, some emerging markets were hit by financial crises while others were not. To this end, we ask whether there are some *fundamentals* that help explain the variation in financial crises across countries or whether the variation just reflects *contagion*. We present a simple model identifying three factors that determine whether a country is more vulnerable to suffer a financial crisis: a high real exchange rate appreciation, a recent lending boom, and low reserves. We find that for a set of 20 emerging markets, differences in these fundamentals go far in explaining why during 1995 some emerging markets were hit by financial crises while others were not. We also find that alternative hypotheses that have been put forth to explain such crises often do not seem to be supported by the data, such as high current account deficits, excessive capital inflows and loose fiscal policies.

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I. Introduction

The Mexican Peso crisis of December 1994 and its reverberations in financial markets of developing countries around the world have intensified the debate over the nature of balance of payments crises in developing countries. Many simple explanations have been given for the Mexican crisis and its aftermath, but none of them does very well in accounting for the main patterns of emerging market behavior in late 1994 and 1995. For example, many observers have claimed that it was Mexico's yawning current account deficit in 1994 that led to the drying up of capital inflows to Mexico and thereby to the collapse of the Peso. At the same time, though, countries such as Malaysia and Thailand ran equally large current account deficits (as a percent of GDP) without suffering from reversals of capital inflows. Other observers claim that investor panic emanating from Mexico spread like a contagion throughout emerging markets. This contagion story fits well with the adverse market reactions felt by Argentina and Brazil in early 1995, but not with the experiences of neighboring Chile and Colombia, which witnessed only slight and transitory market reactions.

In this paper we closely examine the financial events following the Mexican peso devaluation to uncover new lessons about the nature of financial crises. We explore the question of why, during 1995, some emerging markets were hit by financial crises while others were not. To this end, we ask whether there exists some set of *fundamentals* that help explain the variation in financial crises across countries or whether the variation just reflects *contagion*. In what follows, we present a simple model identifying three factors that determine whether a country is more vulnerable to financial crisis: a high real exchange rate appreciation, a weak banking system, and low reserves. We find that for a set of 20 emerging markets, differences in these fundamentals go far in explaining why during 1995 some emerging markets were hit by financial crises while others were not. We also find that in many cases alternative hypotheses that have been put forth to explain such crises are not supported by the data.

In our interpretation, Mexico was subject to a self-fulfilling speculative attack in late December 1994. There were ample reasons for a Mexican devaluation at that point, to be sure. But the speculative attack that hit Mexico, and the magnitude of the resulting currency depreciation, went far beyond what was "inevitable" based on Mexico's fundamental conditions. (We have previously argued this point at length in Sachs, Tornell, and Velasco, 1996a). There is ample evidence that the attack was indeed unexpected and represented a self-fulfilling panic: peso holders suffered extraordinary losses. Had the peso crisis truly been foreseen (as argued recently, for example, by Krugman, 1996), nominal interest rates would have reflected this expectation, and there would have been no extraordinary losses on peso-denominated assets.

After the unexpected Mexican crisis, nervous investors looked at other emerging financial markets for indications of which other currencies might be vulnerable to similar attacks. Market expectations had become pessimistic in the sense that investors expected that *other* investors would now withdraw their funds whenever fundamentals suggested the possibility of a self-fulfilling panic. Therefore, the *possibility* of panic, which had existed before December 1994, became the *fact* of a panic after December 1994. Vulnerable countries (i.e., those with poor

fundamentals) that had sustained investor confidence and capital inflows up until December 1994 suddenly lost that confidence, as investors feared that other investors would lose their nerve. Several vulnerable countries therefore succumbed to their own speculative panics in early 1995: Argentina, Brazil, and the Philippines, for example. This spread of panic was dubbed the *Tequila effect*.

Because financial investors try to avoid short-term capital losses, they flee from countries where they expect a high nominal depreciation to take place soon. Thus, in assessing whether to flee from a country, each investor assesses the likelihood that the country will devalue should capital inflows reverse. A sudden reduction in the capital account can be met by running down reserves. However, if an external gap remains, an abrupt reduction in the current account deficit is necessary to close it. This required adjustment can take place through two mechanisms: a fall in absorption or a real exchange rate depreciation (which, in the short-term, can only be achieved via a nominal depreciation). The depreciation will be greater (a) the more appreciated the real exchange rate relative to the level compatible with lower capital inflows and (b) the more unwilling the government is to endure a recession through a period of overvaluation and high interest rates. A key determinant in the latter decision is the banking system's health. When banks have high bad-loan ratios, a recession is likely to generate many bankruptcies. Therefore, the weaker the banking system, the less likely the government is to choose to engineer a recession.

Our hypothesis helps to account for a subtle characteristic of the *Tequila effect*--that it only hit previously weakened countries. Strong countries, i.e., those with plentiful foreign exchange reserves or solid fundamentals (no overvalued real exchange rate and strong banking systems), suffered only a very short-lived downturn in capital inflows. In contrast, countries with weak fundamentals and scant reserves relative to short-term liabilities were vulnerable to self-fulfilling investor panics. As a result, the shift in expectations generated by the Mexican crisis induced a shift to a pessimistic equilibrium in the weak countries. However, since a unique equilibrium existed in the financial markets of strong countries, panics were not possible there. Notice that our hypothesis does not yield predictions about the exact timing of financial crises because the framework is based on the existence of multiple equilibria in financial markets.

The preceding argument points to three measures of "fundamental risk" in currency markets to explain why some countries were more likely than others to suffer a financial crisis in the aftermath of the Mexican devaluation. First, a real exchange rate appreciation during the capital inflow period relative to past average values indicated a greater risk of currency depreciation in 1995. Second, a very rapid increase, prior to 1994, in commercial bank lending to the private sector also indicated a greater risk of crisis in 1995. Presumably, the prior bank-lending boom indicates greater weaknesses in bank balance sheets and, therefore, more vulnerability to reversals of investor confidence. Third, when capital inflows suffer a reversal, not only do gross inflows dry up, but also holders of liquid domestic liabilities try to convert them into foreign exchange and flee the country. Thus, as suggested by Calvo (1995), reserves must be compared with a broad measure of liquid monetary assets (which can be converted into foreign exchange) in order to determine a country's vulnerability to panic. In this paper we will

consider the ratio of M2 (currency plus demand and savings deposits in commercial banks) to reserves. If this ratio is high, a self-fulfilling panic among bank depositors is more likely to occur.¹

Even though M2 includes the liabilities of private banks, it is the relevant yardstick with which to assess reserve adequacy because it measures the potential amount of liquid monetary assets that agents can try to convert into foreign exchange. Consider the following scenario. Suppose that a bank run erupts, in which each bank depositor tries to withdraw funds from the banking system, believing that other bank depositors will do the same. The run could begin because of the expectation of a future currency devaluation. After such a bank panic begins, the Central Bank has two possible courses of action. To permit the withdrawal of funds, it can extend domestic credit to commercial banks that are suffering from the bank run. The currency, in turn, would be used to purchase foreign exchange, and the central bank would be forced to sell foreign exchange reserves, at least until these reserves ran out and the domestic currency was devalued. Alternatively, the Central Bank can decide not to extend domestic credit, in which case the banking panic leads to bank defaults and presumably to a deep contraction in the real economy. In most countries and at most times, the Central Bank will not choose to let the banking system implode. The threat of devaluation then depends on the stock of reserves compared to the stock of credit that must be extended by the Central Bank in response to the panic. This stock of credit, in turn, depends on the level of M2. In Argentina in 1995, a third path was followed: some domestic credit was provided, backed by an emergency international loan. The devaluation was prevented, and the banking sector was (mostly) saved, but still at the cost of a sharp real contraction of the economy.

To test our hypothesis we construct a crisis index as a weighted average of the percent change in reserves and the devaluation rate with respect to the US dollar, between November 1994 and each month during the first semester of 1995. We find that for a set of 20 emerging markets, a high ratio M2/reserves, a high initial real exchange rate, and a significant increase in bank lending to the private sector before 1994 all tend to increase the crisis index in 1995. Moreover, our three explanatory variables predict 70% of the variation in the crisis index.

The literature includes several hypotheses about how capital inflows, the corresponding policy reaction, and the vulnerability of the economy to shocks are linked. For each hypothesis, it is possible to find a few country case examples that support it. However, it is not clear that any of these hypotheses can be applied broadly to many countries. Using multiple regression analysis, we also explore whether any of these alternative hypotheses help explain the variability of the crisis index after controlling for real exchange rate appreciation, the bank lending boom, and the level of M2/Reserves in our sample of 20 emerging markets. Because regression analysis cannot

¹ In standard models of the balance of payments, following Krugman, the vulnerability to a speculative attack usually results from a drainage of reserves following an excessive *flow* domestic credit expansion. In our view, a currency can be subject to attack even when domestic credit policy is tight, if the *stock* of M2 greatly exceeds the stock of foreign exchange reserves.

incorporate subtle variations in the policy regime or the timing of events across countries, we focus in greater depth on *eight case studies* of countries that received large capital inflows in 1990-94: Argentina, Mexico, and the Philippines (which fared badly in the crisis); and Chile, Colombia, Indonesia, Malaysia, and Thailand (which fared well). (We have also prepared a chronology of monetary and banking policy events in these countries which is available from the authors upon request.)

We find, first, that the sizes of previous current account deficits in 1994 and earlier do not seem to help in explaining why a financial crisis did or did not occur in 1995. Second, the size of prior capital inflows (as a share of GDP) does not contribute much to explaining the variability in the crisis index. However, its composition (short- vs. long-term flows) does explain part of the variation in the crisis index. Last, we find some weak evidence that expansionary government spending helps to explain why certain countries suffered financial crises.

The fact that countries with low reserves, substantial real exchange rate appreciation, and weak banking systems as of late 1994 were on average more vulnerable to currency attacks raises the important question of why some countries experienced more appreciation and greater lending booms than others. We study these questions with special reference to the sample of eight case studies mentioned above. A striking fact in the data is that the Latin American countries experienced sharper real appreciations than did the East Asian economies. Why might this be? Some have argued that it was because of differences in the size of capital inflows; others have argued that the variation was due to differences in the extent of sterilization of those inflows. Still others have argued that the explanation lies in whether a country is in the midst of a stabilization program as well as in the differences in nominal exchange rate policies adopted by countries in the two regions, with the East Asian economies pursuing more flexible nominal exchange rate policies aimed at stabilizing the real exchange rate. These simple (and most common) explanations account for some but not all the cross-country variation. Another possibility is that differences in *economic structure* --such as the existence of a large, labor-intensive manufacturing export sector in Asian countries, which makes it easy to shift labor to the non-tradeables sector when needed-- may account for some of the variation in real exchange rate behavior. If so, Latin America's distinctive economic structure may help explain the region's vulnerability to currency attacks.

We also focus on why bank-lending booms seem to have happened in some countries but not in others. The liberalization of the capital account is an often-mentioned culprit of financial crisis, but we find little evidence to suggest that such liberalization necessarily precedes a lending boom. The connection between *domestic* financial deregulation and fast expansion of lending, on the other hand, is much clearer. Both within our group of eight countries and more broadly, a process of *domestic* financial liberalization that is not coupled with enhanced prudential supervision seems to lead to a sharp expansion in lending by both banks and non-bank financial institutions and (often but not always) to an eventual financial crash. The recent experiences of Mexico and (to a lesser extent) Argentina are instructive in this respect.

The plan of the paper is as follows. In the next section, we present a theoretical model that brings together our three “fundamentals” in determining the circumstances in which multiple equilibria and self-fulfilling currency attacks can occur. We show that multiple equilibria arise when real appreciation and current sensitivity to recession (possibly as a result of a previous bank lending boom) are within a certain range, and foreign reserves are low. We then test the model empirically in section III, and we are able to show that *financial crises occurred only in countries with weak fundamentals and low foreign exchange reserves relative to M2*. In section IV we pit our approach against some popular alternatives, which are found wanting on the basis of cross-country experiences. In section V we turn to the question of real exchange rate behavior, and ask why appreciations took place in some countries and not in others. In section VI we examine the genesis of lending booms in a sample of eight Latin American and Asian countries and the possible connection between the different origins of the booms and cross-country differences in policy. We draw conclusions and suggest some areas for future work in section VII.

II. Explaining the Tequila Effect

Does the extent of exchange-rate devaluation and reserve losses across emerging markets just reflect contagion, or does it reflect differences in fundamentals? Conditioning on a large shock having taken place in December 1994, can one predict the extent of financial crises across emerging markets using a parsimonious model based on pre-crisis information?

To answer these questions consider an investor deciding whether to buy financial assets in an emerging market during a period of turbulence and possible flow reversals. For a given nominal return, the real return can be affected by a large depreciation, imposition of capital controls, outright expropriation, etc. Even if the “bad policy” that causes the capital loss is viewed as transitory, diversified international investors, wary of the heightened uncertainty and facing low costs of relocating resources, typically will park their wealth elsewhere until the dust settles. Usually, when panic sets in and capital inflows suffer a reversal, not only do gross inflows dry up, but also the country, unable to roll over short-term debt, may have to amortize obligations to foreigners earlier than anticipated. The net effect is a massive resource transfer abroad.

At this point the local government is confronted with unpleasant choices. By letting the exchange rate depreciate, it can inflict a capital loss on international investors and reduce the magnitude of the required resource transfer. In addition, if the capital inflow had been financing a current account deficit, this deficit has to be reduced abruptly in order to close the external gap. The required adjustment can take place through two mechanisms. First, by generating a recession and reducing absorption. Second, by generating a real exchange rate depreciation, which induces a transfer of resources from the non-tradeables to the tradeables sector, improving the current account. Since prices are sticky in the short run, a sudden and large real exchange rate depreciation can be achieved only by means of a nominal depreciation. But the unexpected nominal depreciation causes a capital loss to financial investors, who would prefer that the

adjustment take place through higher unemployment.

The actual policy mix (devaluation-recession) depends on the preferences of the government and on the constraints it faces. First, the more appreciated the real exchange rate is (relative to the level that would close the external gap) and the less responsive tradeables are to real exchange rate changes, the greater the nominal depreciation necessary to reduce the current account deficit to the new level compatible with lower capital inflows. Second, the more vulnerable a country is to a sudden contraction in aggregate demand, the less likely the government is to choose recession over depreciation as the method of adjustment. Clearly no country relishes a contraction in absorption and the (likely) attendant recession, but some countries are better prepared to face it than others. Recent experience suggests that the key difference is in the health of domestic banks.² A healthy banking system may resist a recession that would bankrupt a weaker system, bringing all the predictable bankruptcies and associated economic disruption. The recent Mexican story clearly suggests that it was worries about the health of banks (and the political repercussions that bankruptcies would bring in an election year) that prevented the Central Bank from raising interest rates sufficiently to stop the drainage of reserves in the course of 1994.

It follows that (for a given level of international liquidity), the countries where financial investors are most likely to experience a capital loss due to a nominal devaluation are those where a) the real exchange is appreciated and b) the banking system is weak. We will refer to this combination as "weak fundamentals." If investors do not invest in a country with weak fundamentals, then the country will respond with a sharp nominal devaluation in order to bring about the necessary adjustment in the external accounts, thus justifying investors' expectations. This does not occur in countries with sufficiently strong fundamentals.

Consider now the role of different levels of international liquidity, or more specifically, the size of a country's gross reserves relative to its short-term debt. *Ceteris paribus*, the larger the stock of obligations that cannot be rolled over in the event of a crisis (think of Mexico's infamous Cetes and Tesobonos), the larger the required adjustment. Clearly, countries differ widely in their levels of international liquidity. Thus, if a country has weak fundamentals but high net reserves ratios, it is possible that a reversal in capital inflows will not induce a devaluation, for the government might react simply by running down reserves. Understanding this, investors may not fear a capital loss when reserves ratios are high, even if a country has weak fundamentals. Therefore, no financial crisis need take place in such a country.

A Minimal Model

In order to sharpen the above argument and clarify our use of terms, we present a minimal model. The model is static, with simple behavioral assumptions for investors and the government

²See Rojas-Suárez and Weisbrod (1995), Hausmann and Gavin (1995), IMF (1995).

rather than behavior derived from first principles. The model also disregards the intertemporal aspects of both individual behavior (the consumption-savings choice) and government behavior (public debt management). But, given that we focus precisely on situations of potential credit rationing, where intertemporal choices are limited at best, little is lost with this simplification³.

Consider a government that is managing a pegged exchange rate, with nominal exchange rate E_0 , and real exchange rate E_0/P , where P is the domestic price level, taken as predetermined in the short term. For simplicity, we set $P = 1$. The government pegs the exchange rate as long as foreign exchange reserves R are sufficient to finance a net capital outflow K . Thus, there is no devaluation as long as $K \leq R$. In the event that $K > R$, a devaluation occurs. If a devaluation occurs, the government establishes a new nominal exchange rate E^T in order to achieve a target real exchange rate. Thus, the next-period exchange rate E_1 equals E_0 when $K \leq R$, and equals E^T when $K > R$. We denote the size of the devaluation as $D = E_1/E_0 - 1$. Thus, D equals zero when $K \leq R$, and equals $(E^T - E_0)/E_0$ otherwise.

The target E^T is set at the long-run real exchange rate e , which reflects a host of structural variables (the terms of trade, the degree of trade and financial liberalization, expectations of future long-term capital flows, etc.). In addition, the target exchange rate must be adjusted to reflect the health of the banking system. When the banking sector is basically sound, the government will set E^T at e . When the banking sector is in crisis, however, the government will tend to choose a real exchange rate more depreciated than e , since it will not want to maintain high interest rates in order to defend the exchange rate. This is because the recessionary effects of high interest rates are likely to generate widespread bankruptcies of banks when they are weak.⁴ Later on in the paper we will judge banking-sector vulnerability based on whether or not the economy has experienced a lending boom (LB) prior to the period under examination, on the grounds that a preceding spurt in bank lending (i.e. a prior lending boom) will be associated with a *weaker* overall bank portfolio. The target real exchange rate may therefore be written as:

$$E^T = e f(LB), \quad f'(LB) > 0, \quad f(0) = 1 \quad (1)$$

Thus, the potential course of the exchange rate can be summarized as:

³The model is similar in spirit to models of speculative attacks with multiple equilibria, such as those in Calvo (1995), Obstfeld (1994), Sachs, Tornell and Velasco (1996b) and Velasco (1996).

⁴If the domestic banking system also has large stocks of domestic currency-denominated liabilities, the authorities may choose to "help" banks by engineering a depreciation large enough to reduce the value of such debts substantially.

$$D = \begin{cases} \left(\frac{e}{E_0}\right)f(LB) - 1 & \text{if } K \leq R \\ 0 & \text{if } K > R \end{cases} \quad (2)$$

According to (2), a devaluation occurs when there is a capital outflow in excess of reserve levels. The size of the devaluation is greatest when: (a) the exchange rate initially is *appreciated* relative to its long-run average, so that e/E_0 is high; or (b) there has been a preceding bank lending boom, so that $f(LB)$ is large.

The possibility of multiple equilibria arises because capital movements depend on anticipated exchange rate behavior. A peculiar circularity occurs: the devaluation depends on a capital outflow, but the capital outflow itself depends on the expectation of a devaluation. To sketch this multiple equilibria scenario in the simplest possible manner, suppose that there are N small investors, each holding assets k in the banking system of the country. In the event that all of the investors try to flee the country with all of their funds, the size of the incipient capital outflow would be $K = Nk$. The investor's rule is simple: withdraw funds in the event that a devaluation is expected to exceed a percentage θ , and maintain funds in the country as long as D is expected to be less than or equal to θ . The most obvious rationale for this lower bound θ is as follows. Suppose that investors own bonds denominated in domestic currency. They will be willing to hold these bonds as long as expected devaluation is lower than the differential between the domestic and foreign interest rates.

Thus, for investor j ,

$$k_j = \begin{cases} 0 & \text{if } D \leq \theta \\ k & \text{if } D > \theta \end{cases} \quad (3)$$

By symmetry, total capital outflows are

$$K = \begin{cases} 0 & \text{if } D \leq \theta \\ Nk & \text{if } D > \theta \end{cases} \quad (4)$$

Now, consider two cases. First, suppose that fundamentals are "healthy," in the sense

that $(e/E_0) \cdot f(LB) - 1 \leq \theta$.⁵ When this condition applies, any devaluation -- if one occurred -- would be smaller than investors' threshold for capital flight. Therefore, even in the event of a devaluation, $K = 0$. Since $K = 0 < R$, there would not be a devaluation in this case, according to (2).

Second, suppose that fundamentals are "unhealthy," in the sense that $(e/E_0) \cdot f(LB) - 1 > \theta$. In this case, a devaluation would indeed be larger than the investors' threshold for moving funds out of the country. Therefore, K would equal Nk if a devaluation in fact occurred. Would a devaluation occur? If $K = Nk < R$, then it would not: the government would be able to defend the exchange rate against a capital outflow. If $K = Nk > R$, however, a devaluation *might or might not* occur. If each investor expects exchange rate stability ($D = 0$), then each keeps $k = 0$, and no devaluation occurs. If each investor expects a devaluation, however, then $K = Nk > R$ and $D > \theta$. Therefore, we have a region of *multiple equilibria*, where a devaluation may be a self-fulfilling prophecy.⁶

To summarize, we reach the following conclusions:

$$\begin{aligned} \left(\frac{e}{E_0}\right) f(LB) - 1 \leq \theta & \quad \text{then } D = 0 \\ \left(\frac{e}{E_0}\right) f(LB) - 1 > \theta \quad \text{and} \quad R \geq Nk & \quad \text{then } D = 0 \\ \left(\frac{e}{E_0}\right) f(LB) - 1 \leq \theta \quad \text{and} \quad R < Nk & \quad \text{then } D = 0 \quad \text{or} \quad D = \left(\frac{e}{E_0}\right) \end{aligned} \quad (5)$$

We can summarize the implications of the model by returning to the question formulated at the outset of this section: was the Tequila effect due to contagion or fundamentals? The model suggests that if a country had weak fundamentals (i.e. real exchange rate appreciation and/or a weak banking system) in addition to low levels of international liquidity, it would be the likely victim of a currency crisis. The shock simply may have hastened the policy regime's demise. If a

⁵ Notice that, if the real exchange rate is not overvalued and banks are not bankrupt, the expression $(e/E_0) \cdot f(LB) - 1$ could be very close to 0. Therefore, the condition $(e/E_0) \cdot f(LB) - 1 \leq \theta$ could be satisfied even if θ is small.

⁶Of course, one way to overcome the multiple equilibria would be for a *single* lender to lend an overall amount greater than or equal to R , thereby preventing the self-fulfilling devaluation. This is generally impossible when we are considering magnitudes of inflows to an entire country: the inflows in question tend to be much larger than the supply of capital that can be mobilized by any single creditor.

country had very strong fundamentals, then Tequila was likely to pass it by or, at worst, to cause a temporary decline in asset prices which would soon be reversed leaving little or no trace behind.

III. Empirics

Our theoretical model suggests that the countries that are more vulnerable to a capital inflow reversal are those with weak fundamentals (a weak banking system and/or an overvalued real exchange rate) and low reserves relative to their liquid liabilities. These countries are more likely to respond to a capital outflow with a nominal devaluation, validating the fears of investors. Therefore, a negative shock like the Mexican crisis of December 1994 is more likely to be contagious among these countries. In this section we show that in 1995 contagion did not occur randomly across emerging markets. The Mexican crisis spread to countries with weak fundamentals and low reserve ratios, but not to countries with strong fundamentals or high reserves ratios.

We measure the extent of financial crisis in 1995 with a “crisis index” (denoted IND) that is designed to measure pressures on the foreign exchange market. IND is a weighted average of the devaluation rate with respect to the U.S. dollar and the percentage change in foreign exchange reserves between the end of November 1994 and the end of each month during the first semester of 1995. Because the two series have different volatilities, the weights we apply to each series (for each country) are given by the relative precision of each series over the past ten years.⁷ The rationale for this index is the following. If capital inflows reverse, authorities can react by letting the exchange rate depreciate. Alternatively, they can defend the currency by running down reserves or by increasing interest rates. Since there are no reliable and comparable cross-country interest rate data, we construct the index using reserves and exchange rates. The values for IND are listed in Table 9. *A higher value of IND means higher devaluation or a greater fall in reserves*: in other words, a more serious Tequila effect.

The next step is to create measures of real exchange rate misalignment and excessive bank lending. We construct a real exchange rate index as a weighted sum of bilateral real exchange rates (using home and foreign CPIs) vis-a-vis the dollar, the D-mark, and the yen. The weights sum to one and are proportional to the country’s bilateral trade shares of Japan, the U.S., and the European Union. We then measure the extent of real exchange rate misalignment by measuring the change in the real exchange rate index between the average of 1986-89 and the

⁷A similar index has been used by Eichengreen, Rose and Wyplosz (1995) for the case of Europe, by Frankel and Rose (1996) to study currency crises in developing countries, and by Kaminsky and Reinhart (1995) to study banking and balance of payments crises. Barro (1995) uses the stock market index to measure the extent of the financial crisis.

average of 1990-94⁸. The variable is termed RER. Note that a high value of RER signifies that the real exchange rate is *depreciated* relative to the base period, while a low value signifies appreciation relative to the base period. We expect that the Tequila effect will hit countries with a *low* value of RER. Although this way of measuring misalignment is common in the literature, it has serious shortcomings such as not controlling for long-run productivity changes or terms of trade shocks that can move the long-run value of RER. In defense of our approach we should note that in this paper we are trying to identify countries that, during a span of four years, experienced extreme overvaluations. Thus, if our index indicates a real appreciation on the order of 30% to 60%, it is very unlikely that this was caused by a productivity shock rather than misalignment. The values for the real exchange rate index are listed in Table 9.

To the best of our knowledge, there exists no broad cross-country set of comparable bank balance sheets. Hence, the weakness of the banking sector cannot be assessed directly by simply comparing ratios of non-performing loans to total assets. We rely instead on an indirect measure of financial system vulnerability: the magnitude of the increase in bank lending between 1990 and 1994. In countries where bank lending expands very sharply during a short period of time, we presume that the banks' ability to screen marginal projects declines, so that the banks are more likely to end up with a large share of weak borrowers in their portfolios. High risk areas, such as credit cards and consumer and real estate loans, tend to grow more than proportionately in these cases of lending booms. In addition, regulators (particularly in developing countries) soon find their limited oversight capacity overwhelmed. Thus, a bank lending boom is likely to produce a banking sector portfolio that is extremely vulnerable to the vagaries of the business cycle.⁹ To identify cases of lending booms, we first measure the size of the banking sectors' claims on the private sector, B/GDP. (We include claims of demand deposit banks and monetary authorities¹⁰). Then we look at the percentage change in this ratio between 1990 and 1994, which we denote as $LB = (B/GDP)_{1994} / (B/GDP)_{1990} - 1$. We assume that countries with a very large increase in bank lending are cases of lending booms (LB high), and therefore vulnerable banking sectors. The values for LB are listed in Table 9.

If in a time of capital inflow reversal the Central Bank is not willing to let the exchange rate suffer a sharp depreciation, it must be prepared to cover all its liquid liabilities with its

⁸ We chose the average of the real exchange rate from 1990-94 as the end point instead of the rate in 1994 to capture the idea that in a country that has had an overappreciated currency for a longer period, firms in the tradeables sector are more likely to have exited. Thus, the longer the period of real appreciation, the greater the real exchange rate devaluation needed to bring about a given improvement in the trade balance. Moreover, none of the 20 countries in our sample experienced a sharp nominal depreciation during the first eleven months of 1994.

⁹See Rojas-Suárez and Weisbrod (1994), Hausman and Gavin (1995).

¹⁰We do not include non-bank financial institutions because this data is not available for all the countries in our sample.

reserves. These liabilities include not only direct liabilities -- the monetary base -- but also the liquid liabilities of commercial banks, which can be withdrawn quickly. If the Central Bank does not intervene in the event of a run on banks, bankruptcies could easily follow. Given the well-documented aversion of governments to bank bankruptcies, the larger liquid bank liabilities, the larger the contingent claims on the Central Bank. Therefore, as argued by Calvo (1994), the correct yardstick with which to evaluate reserves abundance is a broad measure of money such as M2, compared with the stock of foreign exchange reserves. In the empirical analysis below we use the ratio M2/Reserves in November 1994 as our indicator of reserve adequacy. The values for this ratio are listed in Table 9.

Since we are interested in countries that were exposed to international capital flows, we consider the countries in the Emerging Market Data Base from the International Finance Corporation. This sample consists of the emerging markets where foreigners can invest with relative freedom in stocks and other financial instruments. We excluded from this sample transition economies (China, Hungary and Poland), countries that belong to the EU (Greece and Portugal) and Nigeria, for which there are no data available for claims on the private sector. Our resulting sample consists of 20 countries: Turkey, South Africa, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, Jordan, Sri Lanka, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Thailand, Zimbabwe and Taiwan.

To compute the real exchange rate indices, we calculated the trade weights from the Directions of Trade Statistics of the IMF. For the countries that had multiple exchange rates we obtained data on parallel exchange rates from the World Currency Yearbook and the Country Reports on Economic Policy and Trade Practices. The rest of the data came from the IFS CD-Rom. For the cases in which data were missing, we used country sources and the Recent Economic Developments from the IMF, which have been made available recently. In each case we made sure that the data were compatible by checking that they coincided with the IFS for the years for which data are available. The main data are listed in Table 9.

Recall from the previous section that if a country has (1) a strong banking sector, and (2) a real exchange rate that is not very appreciated, then even if capital inflows were to reverse, expected depreciation would be lower than the threshold that induces investors to flee from the country. Therefore, when a country has sound fundamentals, investors will not attack it. Similarly, if fundamentals are weak, but M2/R is low, then there will not be a speculative attack. In other words, a speculative crisis arises only when *both* fundamentals and reserves are vulnerable.

To implement the model, we first classify countries as strong or weak on fundamentals and reserves, by ranking the countries with regard to RER, LB, and M2/R. We first classify the countries in such a way that *most* are deemed to be in the region where a self-fulfilling attack is possible. We then tighten the definition of weak and strong fundamentals so that fewer countries are classified as being in the vulnerable region, and observe how the results change as we change the classification. In our broader classification, we say that a country has *strong fundamentals* if its real depreciation is in the highest quartile of the sample *and* its bank lending boom is in the

lowest quartile. Otherwise, we say that the country has weak fundamentals, and is presumed to be vulnerable to a self-fulfilling attack. We create a dummy variable for weak fundamentals, with $D^{WF} = 1$ signifying weak fundamentals, and $D^{WF} = 0$ signifying strong fundamentals. Similarly, we classify a country as having high foreign exchange reserves if its M2/Reserves ratio is in the highest quartile of the sample. Otherwise, we consider its reserves to be in the danger zone. Thus, the dummy variable for low reserves, D^{LR} , is equal to 1 for countries below the first quartile for the money-to-reserves ratio.

This definition of D^{WF} and D^{LR} casts a wide net: it deems thirteen of the twenty countries vulnerable to a self-fulfilling reversal of capital inflow. These countries are Turkey, South Africa, Argentina, Brazil, Mexico, Jordan, Indonesia, Korea, Malaysia, Philippines, Thailand, Zimbabwe and Taiwan. The seven countries not deemed vulnerable are Chile, Colombia, India, Pakistan, Peru, Sri Lanka and Venezuela. Below we consider increasingly stringent definitions of the two dummy variables, D^{WF} and D^{LR} , and show that our results are relatively robust to this modification.

The basic equation regresses the crisis index IND on the levels of RER and LB, taking into account the strength or weakness of these fundamentals and the adequacy of foreign exchange reserves. *The main idea is that the effect of RER and LB on IND should be non-linear, with a large effect only when both D^{WF} and D^{LR} are equal to 1.* We implement this idea by estimating the IND equation in the following form:

$$IND = \beta_1 + \beta_2 * RER + \beta_3 * LB + \beta_4 * (D^{LR} * RER) + \beta_5 * (D^{LR} * LB) + \beta_6 * (D^{LR} D^{WF} * RER) + \beta_7 * (D^{LR} D^{WF} * LB) + \epsilon$$

The coefficients β_2 and β_3 capture the effects that fundamentals have on the crisis index in countries with high reserves ($D^{LR} = 0$) and strong fundamentals ($D^{WF} = 0$). According to our model these coefficients should be zero. The effects that the fundamentals have in countries with low reserves ($D^{LR} = 1$) but strong fundamentals ($D^{WF} = 0$) are given by $\beta_2 + \beta_4$ and $\beta_3 + \beta_5$. Our model again predicts that $\beta_2 + \beta_4 = \beta_3 + \beta_5 = 0$. That is, countries with strong fundamentals are not likely to suffer an attack, even if they have low reserves. Lastly, $\beta_2 + \beta_4 + \beta_6$ and $\beta_3 + \beta_5 + \beta_7$ capture the effects fundamentals have on the crisis index in countries with low reserves and weak fundamentals. In these countries, we expect $\beta_2 + \beta_4 + \beta_6$ to be negative: a more devalued real exchange rate as of November 1994 should lead to a smaller value of IND in 1995. Similarly, we expect $\beta_3 + \beta_5 + \beta_7$ to be positive: a higher bank lending boom should lead to a larger value of IND.

Table 1 presents the regression results as we vary the terminal month of the dependent variable over a period of six months (from January 1995 through June 1995). The signs of each set of relevant coefficients stay constant across the six cases. In order to evaluate alternative hypotheses regarding the causes of financial crises, we will use as our benchmark the crisis index for the period November 1994-April 1995. The point estimate of $\beta_2 + \beta_4 + \beta_6$ is -2.65 and that of $\beta_3 + \beta_5 + \beta_7$ is +3.83. The signs are as expected, and Wald tests indicate that the hypotheses that $\beta_2 + \beta_4 + \beta_6 = 0$ and $\beta_3 + \beta_5 + \beta_7 = 0$ can be rejected at the standard significance levels (their p-values

are 7% and 4% respectively). As can be seen in Table 1, these hypotheses cannot be rejected for the periods November-March and November-May. The estimates of $\beta_2+\beta_4$ and $\beta_3+\beta_5$ are different from zero at the 10% level of significance (Wald tests of the hypotheses $\beta_2+\beta_4=0$ and $\beta_3+\beta_5=0$ have associated p-values of 72% and 12% respectively). The same is true for the other five periods. Lastly, the estimates of β_2 and β_3 are positive and significantly different from zero at the 5% and 10% levels respectively. These estimates correspond to the five high-reserve countries in our sample.

The regression results support the idea that the level of Central Bank reserves relative to short term liabilities is important in determining whether a country is vulnerable to a self-fulfilling panic. An interesting case in point is the comparison of Mexico and Peru. Both countries experienced a sharp real appreciation (28 percent and 45 percent, respectively) and a lending boom (116 percent and 156 percent, respectively), but only Mexico got hit by a deep crisis in IND. The difference was that Peru did not have low foreign exchange reserves relative to M2. Specifically, in Peru the M2/Reserves ratio was only 1.4, while in Mexico the ratio was 9.1.

Results in Table 1 show that during the first semester of 1995 between 51% and 71% of the variation in the crisis index is explained by movements in the real exchange rate, the lending boom, and dummies. This suggests that contagion was not random. Instead, the Mexican crisis had contagious effects mainly in countries with low reserves that had experienced real exchange rate appreciations and/or steep increases in bank lending to the private sector in 1990-94.

If we fitted a simpler equation using only a reserves Dummy instead of using the equations presented in Table 1, we would obtain similar results. For the period November 1994-April 1995 the fitted equation is

$$\text{IND} = -18.29 - 1.93\text{RER} + 3.66\text{LB} + 7.06\text{RER}*\text{D}^{\text{HR}} - 2.36\text{LB}*\text{D}^{\text{HR}}$$

(28.39) (1.12) (1.65) (2.42) (1.39)

R-squared = 0.65

Note that the coefficients on RER and LB correspond to low-reserve countries. Thus, the second and third coefficients show that in low-reserve countries a higher real appreciation and a higher lending boom increase the crisis index.

Our regression results are robust to changes in the definition of the dummy variables. Table A.1 presents the regression results for different definitions of the dummies. The signs and significance of $\beta_2+\beta_4$, $\beta_3+\beta_5$, $\beta_2+\beta_4+\beta_6$ and $\beta_3+\beta_5+\beta_7$ remain the same as in our benchmark equation if we add one or two countries to the high reserves group, to the low lending boom group and to the low appreciation group. If we add three more countries to these groups the only

change would be that $\beta_2+\beta_4+\beta_6$ would become insignificant. Also, the results would remain unaffected if we eliminated one country from the high reserves group, one from the low lending boom group and one from the low appreciation group.

In addition, our regression results are not driven by a single country. Table A.2 presents the regression results if, out of the countries with the largest changes in their crises indexes, we eliminate one country at a time from the sample. In each case, the signs and significance of $\beta_2+\beta_4$, $\beta_3+\beta_5$, $\beta_2+\beta_4+\beta_6$ and $\beta_3+\beta_5+\beta_7$ remain the same as in our benchmark equation.

It is interesting to note that the percent change in M2/GDP between 1990 and 1994 does not perform as well as our lending boom variable LB (measured as the percentage change in B/GDP, where B is bank loans to the private sector). If we replaced our lending boom variable by the percentage change in M2/GDP in regression (1), the point estimate of $\beta_2+\beta_4+\beta_6$ would be negative but insignificantly different from zero. Similarly, the point estimate of $\beta_3+\beta_5+\beta_7$ would be positive but insignificantly different from zero. Moreover, the R-squared statistic for this regression is 29%, down from 69% in the regression using the lending boom variable. This reflects the fact that M2/GDP is a broader measure of liquidity (or financial deepening) which need not be correlated with the degree of bank vulnerability. It is bank vulnerability that seems to play the more important role in determining a country's vulnerability to crisis in 1995.

The finding that a high M2/Reserves ratio is helpful in predicting the extent of a financial crisis lends some support to the Calvo hypothesis, that central banks implicitly must be prepared to defend currencies against the overall stock of liquid monetary assets. A high M2/Reserves ratio makes countries more vulnerable to speculative attacks. Similarly, the finding that real exchange rate appreciation increases the likelihood of a financial crisis supports the view espoused by Dornbusch, Goldfajn and Valdes (1996). However, this finding should be qualified: the effect of the real exchange rate operates most powerfully only when the country's reserves are low relative to the stock of money.

IV. Other Possible Determinants of Financial Crises

There are several alternative hypotheses in the literature regarding the vulnerability of an economy to capital flow reversals. Several of these hypotheses are supported by case-study comparisons of the experiences of a few countries, but their broader applicability is less clear. In what follows, we consider a handful of these hypotheses and evaluate their broad explanatory power. First, using multiple regression analysis we check whether these hypotheses help to explain the variability of IND after controlling for RER, LB, and M2/Reserves. Second, we compare the predictions of these hypotheses with the experiences of eight countries: Argentina, Mexico, and the Philippines (which fared badly in the crisis); and Chile, Colombia, Indonesia, Malaysia, and Thailand (which fared well).

Excessive capital inflows make eventual financial crises more likely

In its simplest form, this view argues that what comes in must eventually go out: large capital inflows today may (but need not) lead to large outflows tomorrow. The implications of this view are weighty if, as argued by Calvo, Leiderman and Reinhart (1994) and others, capital flows are largely exogenous to emerging markets, so that a sudden flight may be triggered by circumstances far from policy makers' control. Of course, some developing economies (e.g. Korea in the 1960s) have taken in large amounts of foreign capital over long periods of time with few harmful effects, but this is alleged to have occurred in periods of much more stable capital flows. In today's world of fickle private capital movements, it is argued, large inflows leave a country exposed to the latest mood of Wall Street traders.

To explore whether this view is supported by the data, we added to our benchmark regression, equation (1), the average ratio of capital inflows to GDP from 1990 to 1994 alone and interacted with the low reserves dummy and the low reserves and weak fundamentals dummy (we denote the corresponding coefficients by β_8 , β_9 and β_{10} respectively). We estimate this regression imposing two restrictions: $\beta_2 + \beta_4 = 0$ and $\beta_3 + \beta_5 = 0$. As can be seen in Table 2, the estimates of β_8 , β_9 and β_{10} are insignificant. Moreover we cannot reject the null hypotheses that $\beta_8 + \beta_9 = 0$ and $\beta_8 + \beta_9 + \beta_{10} = 0$. We obtain the same results when we include the percentage change between 1990 and 1994 in capital inflows as a share of GDP. Thus, if the level of capital inflows influences the likelihood of financial crisis, it probably does not do so directly, but rather by affecting the real exchange rate and bank lending.

Moreover, the hypothesis that high capital inflows make a financial crisis more likely does not fare well in our smaller sample of eight countries, as can be seen in Table 3. True, troubled Mexico's average capital account surplus¹¹ (i.e. capital inflows) of 5.6% of GDP in 1989-94 may seem risky, but it pales in comparison to the 9.9% and 10.1% surpluses posted by Malaysia and Thailand (arguably the Asian economies *least* affected by Tequila) and the 6.3% posted by Chile (doubtlessly Latin America's star performer in this period). Moreover, the regional average of capital inflows for Latin America (4.2%) is in fact substantially below that of Asia (7.3%). And if we divide the countries into those strongly affected by Tequila (Argentina and the Philippines in addition to Mexico) and those affected less strongly, we find that on average the latter enjoyed a larger capital account surplus (6.3%) than the former (4.9%).

The composition of capital inflows is what matters

This hypothesis comes in two varieties. The first emphasizes that short-term flows (equities, short-maturity bonds, deposits in local banks) can turn around easily, while longer

¹¹Including errors and omissions.

term flows (long maturity bonds and loans, and especially foreign direct investment) cannot. The second stresses the effects of each kind of flow: long term capital inflows such as FDI are good because they increase the productive capacity of the country and produce the revenues necessary to cover future capital outflows (if they occur), while short term flows can be associated with consumption booms or inefficient investment projects.¹² However, both varieties of the hypothesis have the same flavor: FDI is desirable; *hot money* is not.

To determine whether this dichotomy is important, we add to the benchmark regression (in the same way as we added capital inflows) the average ratio of short-term capital inflows to GDP from 1990 to 1994, and the percentage change in this variable between 1990 and 1994 (one at a time).¹³ As can be seen in Table 2, the average ratio of short-term capital inflows seems to matter (with marginal statistical significance) in the prediction of financial crises in countries with low reserves and weak fundamentals (the hypothesis that $\beta_8 + \beta_9 + \beta_{10} = 0$ is rejected with a p-value of 9%). Short-term capital inflows do not enter significantly when reserves and fundamentals are strong.

In our smaller sample of eight countries the evidence that short-term capital inflows matter is weaker. As can be seen in Table 3, the gang of three troubled countries (Argentina, Mexico and the Philippines) received on average the same share of GDP in the form of short-term inflows (2.2%) as the relatively untroubled nations. Within Latin America, unscathed Chile actually absorbed more hot (i.e. short-term) money on average (3.3% of GDP) than did collapsing Mexico (3.0%). These are averages over six years, and it could be argued that with short term flows only the last year matters. But this consideration changes the conclusions little. If we consider 1993 (1994 is already tainted by the shock for some countries), the average of short term inflows for the countries that later came under attack is 3.3% of GDP, while for the others it is a very similar 3.0%.

Large current account deficits during the period of inflows make a financial crisis more likely

In the case of Mexico, a large and growing current account deficit is often singled out as a

¹²This last link can be rationalized in the following way: if domestic banks are borrowing abroad and re-lending at home, they will be unwilling to finance long-term investment projects with short-term borrowing, preferring to direct the resources to more liquid credit card or consumption loans. And if in fact the resources end up in the hands of a domestic real investor, the investor must be willing to finance an investment project with short-loans --a high risk strategy which may reveal something about the quality of the management or the project.

¹³Defined as the sum of portfolio investment, other short-term flows and errors and omissions.

key determinant of the crisis.¹⁴ This story has two strands. In one, large deficits lead to high external debt, to the point where the country either becomes insolvent (the present value of conceivable trade balance surpluses does not suffice to cover external obligations) or hits a borrowing constraint (lenders understand that the country will have no incentives to repay any additional debt).¹⁵ In either case, lending ceases when the turning point is reached and the country finds itself in a crisis. The second strand stresses that even when insolvency or credit limits are not initially an issue, large external deficits expose countries to the fickleness of capital markets. If investors suddenly decide to stop financing its deficits, a country must go through a sudden and painful adjustment. If, in addition, this adjustment creates severe economic disruption (labor unrest, the need to levy highly distortionary taxes, etc.), *ex post* the country may have difficulty paying, thus validating the pessimistic expectations of investors. In this case there would be multiple equilibria.¹⁶

Such concerns have been stimulated by the recent experience of Mexico. But can we generalize the link between large current account deficits and vulnerability to financial crises to other emerging markets? A look at Malaysia is instructive, as can be seen in Table 4. Malaysia's current account over the last decade seems more suggestive of the usual image of Latin America than that of South East Asia. In 1989-94 Malaysia's average deficit was reasonably high: 4% of GDP as compared to Mexico's 5.6%. It was also extremely variable, increasing from 2% of GDP in 1990 to almost 9% in 1991, falling for a couple of years, and rising back up to almost 6% in 1994. Malaysia is not unique among Asian countries in this regard. In 1989-94, the average current account deficit for an Asian country in the group was 4.1% of GDP; the corresponding figure for a Latin American country was 2.1%. In the same period, the average external deficit for Argentina, Mexico and the Philippines was 3.5% of GDP, while for the remaining countries not hit by crisis it was 2.9%-- not enough of a difference to account for the differences in the depths of the financial crises that occurred in early 1995.

Regressions for the larger sample of emerging markets tell a similar story. In Table 2, we include in the benchmark regression the average ratio of the current account to GDP from 1990 to 1994 alone and interacted with the low reserves dummy and the low reserves and weak fundamentals dummy (we denote the corresponding coefficients by β_8 , β_9 and β_{10} respectively). Again, in this case we cannot reject the null hypotheses that $\beta_8 + \beta_9 = 0$ and $\beta_8 + \beta_9 + \beta_{10} = 0$. The same is true for the percentage change in the ratio of the current account to GDP for the period 1990-1994.

¹⁴Dornbusch and Werner (1994) stressed this point even before the collapse. Dornbusch, Goldfajn and Valdes (1996) have stressed it since.

¹⁵Atkeson and Rios-Rull (1995) emphasize this latter interpretation in the case of Mexico.

¹⁶See Calvo (1995), for an explanation along these lines.

If the change in the current account does not seem to matter, do its components have an independent effect?¹⁷ A plausible view is that a current account deficit caused by an increase in investment is less of a concern (presumably, because productive capacity and hence the ability to repay debt are increasing) than one caused by a fall in savings. This view does not receive support in our regression analysis. As presented in Table 2, the average and percentage changes in savings/GDP and in investment/GDP for the period 1990-94 do not seem to contribute to an explanation of why some countries were hit by financial crises and others were not.

Loose fiscal policies are behind financial crises

Imprudent fiscal policies have often been singled out as causes of financial and currency crises in emerging markets --particularly in Latin America. A country's fiscal stance may matter directly: for instance, a large public sector borrowing requirement over time may lead to a ballooning public debt and investor discomfort. Perhaps more importantly, a fiscal deficit may be the cause of many of the other often-mentioned culprits of financial crises, such as current account deficits, real appreciation, and high monetary growth. Any effect these seem to have on the likelihood of crisis actually may be a result of the underlying influence of fiscal policy.

As important as a country's fiscal stance may be in theory, it is important to notice that irresponsible fiscal behavior was not among the central causes of the recent troubles. Consider the case of Mexico: its government ran budget surpluses in 1992 and 1993, and a deficit of less than 1% of GDP in 1994; its public debt, at about 30% of GDP, was less than half the OECD average.¹⁸ The same is true of Argentina (where in 1992-94 the deficit averaged 0.5% of output) and to a lesser extent of the Philippines (with an average deficit of 1.6% of GDP in the same period).¹⁹ What is undoubtedly true, however, is that fiscal performance was better on average in the non-crisis countries: if we take 1989-94 as a whole, the non-crisis countries show an average surplus of 0.6% of GDP, as opposed to a deficit of 1.7% of GDP for Argentina, Mexico and the Philippines. Once again, though, while these differences are not trivial, neither are they large enough to account for the huge disparities in observed outcomes.

¹⁷A cautionary point: as Feldstein and Horioka (1980) pointed out, savings and investment are highly correlated in the medium run even in environments in which one might expect a high degree of capital mobility (think of industrial countries). The point is even more relevant in the case of emerging markets, which are imperfectly integrated into world financial markets.

¹⁸See Sachs, Tornell and Velasco (1996a) for details and discussion.

¹⁹Such numbers have to be interpreted with caution. Talvi (1993) has stressed that, in the context of a consumption boom, a measure of the deficit that is not cyclically adjusted can be extremely misleading. The point seems to have some validity for Mexico and Argentina, where the 1995 recessions caused incipient (and substantial) deficits and made a sharp fiscal adjustment necessary.

To check for the influence of fiscal policy more generally, we included as predictors in our regressions the average and percent change over the period 1990-1994 in the ratio of government consumption to GDP (in the same way as we added capital inflows). As can be seen in Table 2, the percent change in government consumption seems to matter in the prediction of financial crises, but once again only in countries with low reserves and weak fundamentals (the hypothesis that $\beta_8 + \beta_9 + \beta_{10} = 0$ is rejected with a p-value of 3%). Government consumption does not enter significantly in the other cases. We did not perform a regression with the fiscal deficit because of lack of adequate comparable cross-country data for 1993 and 1994.

V. The Crucial Real Exchange Rate

As the results in the previous sections show, a big share of cross-country variation in the crisis index is explained by variations in the real exchange rate and the patterns of bank lending in the 1990s, and by the ratio of reserves to monetary assets. The natural question to ask is what accounts for changes in these variables. In this section we focus on the behavior of the real exchange rate in our sample of eight countries. The following section deals with the genesis of the bank lending booms.

The conventional wisdom is that capital inflows and outflows (and, of course, terms of trade shocks) explain much of the short run variation in the real exchange rate. The standard story has capital inflows stimulating overall absorption, so that the demand for both traded and non-traded goods must rise. If the economy is open, it faces a very elastic supply of tradeables at world prices. Supply of non-tradeables, on the other hand, is much more inelastic, reflecting the fact that resources have to be redeployed to the home goods sector if its output is to increase. The capital inflow, then, naturally increases the relative price of non-traded goods.

But this conventional wisdom does not fit well with the data. The most striking fact about the large sample of emerging markets --and about our eight cases in particular-- is *the lack of correlation between the size of capital inflows and real exchange rate behavior*. In Table 7 we classify countries according to the size of their real appreciation. The countries with the largest real appreciation experienced an average capital account surplus (i.e. capital inflow) of 3.6% of GDP in 1990-94; for the countries in the middle group the average surplus was 6.5%; and it was 6.7% for those in the group with least appreciation!

There are three other generic types of explanations for the varying behavior of the real exchange rate. First, similar capital inflows might lead to different changes in absorption (and therefore to differences in the demand for nontradeables) across countries. Second, although the resulting changes in absorption might be similar, *structural* differences across countries might make the associated price responses different. Third, in the short run nominal exchange rate policy may limit the extent of appreciation even if fundamentals have changed. In what follows we consider each explanation in turn.

Similar capital inflows lead to different changes in absorption

One possibility is that capital comes in, but the inflow does not lead to additional demand for goods and services. This could happen for several reasons. We focus on two: sterilization of inflows and offsetting fiscal contraction.

In theory, at least, a country with an active Central Bank could simply buy up the inflow, leaving demand unchanged. The balance of payments identity is helpful at this point: $CA + \Delta R = KA$. If the whole of the capital account surplus goes into reserve accumulation ($\Delta R = KA$), the current account need not register a deficit. In practice, however, sterilization of this magnitude -- several percentage points of GDP per year-- is not easily accomplished, since there can be quite high costs of sterilization, in the form of central bank losses or disintermediation of the banking system.^{20 21} All countries in the crisis group except for Argentina engaged in sterilization of some sort, but they did so with differing intensities and degrees of success. All the Asian countries engaged in substantial open market operations, and all but Indonesia used reserve requirements in a counter cyclical manner. In addition, Malaysia and Indonesia --along with Singapore and Taiwan (not in our group)-- actively moved around government deposits and pension fund assets to lower deposits held by commercial banks. In Latin America, Chile and Colombia come close to the Asian *modus operandi*, with active sterilization on all fronts --particularly early in the inflow period. Mexico is a peculiar case, having generously issued *Cetes* and *Tesobonos* as part of its open market operations, but moving in the other direction in setting required bank reserves against peso deposits to zero. To summarize the evidence, differences in sterilization do not seem to account for the large differences in real exchange rate outcomes.

²⁰The literature on the mechanics and effects of sterilization has grown tremendously in the last couple of years. Useful contributions can be found in Calvo (1991), Reisen (1993), Frankel (1994), Spiegel (1995) and Reinhart and Reinhart (1995), among many others.

²¹Traditional open market operations (i.e. sales of bonds by the Central Bank) affect the Central Bank balance sheet (higher foreign exchange reserves are matched by higher domestic bond liabilities) but ensure that the money base is unchanged after a capital inflow. The trouble here is that OMOs are fiscally costly, for the bonds used to sterilize the money supply typically carry much higher interest rates than the Central Bank can earn by depositing the additional foreign exchange reserves abroad. A less direct kind of sterilization relies on changes in required bank reserves (and therefore in the monetary multiplier) to ensure that the money supply remains unchanged even if the monetary base has risen. The problem here is that high reserve requirements encourage disintermediation, and may cause financial activity to move to curb markets over which the Central Bank has no control. Additionally, countries can attempt to prevent inflows from being intermediated by the domestic banking system (and thereby re-lent) by requiring borrowers --in particular public enterprises-- to deposit loan proceeds at the Central Bank rather than at commercial banks.

Another reason (in addition to sterilization) why domestic absorption might fail to rise in response to capital inflows has to do with countercyclical fiscal policy. Clearly, if a cut in the government deficit is of similar magnitude to an increase in private spending, aggregate demand will be largely unchanged. More important for our purposes, if government expenditure falls largely on non-traded goods (as it does), then a cut in government spending in response to an increase in capital inflows will directly diminish excess demand in the non-traded sector, helping limit increases in the real exchange rate.²² The behavior of government consumption does provide evidence that countries that contracted fiscal expenditures experienced less appreciation. As Table 7 shows, the countries in the highest appreciation group actually expanded government consumption by an average of 0.8 percentage points of GDP between the period 1986-89 and the period 1990-94.²³ For countries in the middle group, government consumption was approximately constant as a share of GDP between these two periods, while for those with the least appreciation it actually fell by 3.9 percentage points of GDP.

Differences in Structure

Another reason why Asia and Latin America might differ with respect to real exchange rate movements is differences in the underlying productive structures of their economies. An argument in favor of this explanation might go as follows. In Latin America, the tradeables sector is very resource-intensive, while the non-tradeables sector is more labor-intensive. Therefore, a sizeable change in the relative prices of nontradeables and tradeables would be required to induce a movement of labor between the two sectors. When demand for nontradeables rises (e.g. because of a capital inflow), a large increase in the relative price of nontradeables accompanies the flow of labor from tradeables to nontradeables. In East Asia, by contrast, where manufactures are labor-intensive, the flow of labor between nontradeables and tradeables can occur without sizeable movements in the price of nontradeables relative to tradeables. In graphic terms, the production possibility frontier between tradeables and non-tradeables is nearly linear for Asian countries, while for Latin American countries it is strongly bowed outward. If this view is correct, the real exchange rate in Latin America would be highly sensitive to shifts in domestic absorption caused by changes in capital inflows. In Asia, the real exchange rate would vary almost not at all with capital inflows.

An implication of this hypothesis is that, after controlling for other more conventional sources of variability, the real exchange rate should be less volatile in countries with a large labor-intensive tradeables sector. To see whether there is evidence to support this hypothesis, we estimated the regressions contained in Table 8 using the same sample of countries as in the

²²Corbo and Hernandez (1994) stress this point.

²³Regrettably, no information is available for the behavior of government consumption in Argentina.

previous regressions. The variance of the real exchange rate in 1980-92 is postulated to depend on the variance of the terms of trade and of government consumption in the same period and on the ratio of manufactured exports to GDP in 1980-92. Since the latter is an endogenous variable, we instrument it by using population density (number of inhabitants per square mile) and the Sachs-Warner (1995) index of trade policy openness. The instruments work reasonably well, as can also be seen in Table 8. The results of the main regression are mixed. Somewhat surprisingly, the variance of the terms of trade is only marginally significant. The variance of government consumption has the wrong sign and is insignificant. Most important for our purposes, the share of manufactured exports has the expected sign (a higher ratio means less variability for the real exchange rate), but has a p-value of 0.18. If we run the same regression eliminating the variance of government consumption as a regressor (given the poor performance of the fiscal variable), the p-value falls to 0.10. Thus, there is some weak evidence to suggest that the larger a country's tradeables sector, the lower the variability in its real exchange rate resulting from fluctuations in world interest rates and domestic demand.

Nominal Exchange Rate Policy

The explanations discussed so far have focused on the degree to which the equilibrium real exchange rate changes in response to capital inflows and other fundamentals. An alternative line of explanation focuses not on the underlying fundamentals, but on the degree to which nominal exchange rate policy can prevent the real exchange rate from appreciating even if the underlying "equilibrium" relative price of non-traded goods has changed. This is what the policy of "real exchange rate targeting" seeks to achieve.²⁴

Most economists would agree that if the capital inflow and therefore the change in the "fundamental" real exchange rate are more or less permanent, then in the long run real exchange rate targeting cannot succeed: repeated nominal devaluations would simply elicit repeated increases in prices, failing to affect the real exchange rate. But as usual, definitions of what constitutes the "long run" vary widely. If there is enough price stickiness over plausibly short periods, and if capital inflows are also short-lived, so that a brief period is all that is at stake, then nominal exchange rate policy may well have some ability to prevent real appreciation.²⁵

²⁴An alternative description, probably preferred by those who advocate such policies, is that since capital inflows are typically transitory they do not change the long run equilibrium real exchange rate. According to this logic, real exchange rate targeting simply attempts to keep the current real exchange rate from deviating too far from its "long run" level.

²⁵Calvo, Leiderman and Reinhart (1995) make a different point concerning the potential virtues of targeting: even if it is inflationary, it may be welfare-improving. Consider a standard maximizing model in which domestic money is held because of a cash-in-advance constraint. Suppose the foreign nominal (but not real) interest rate falls temporarily. If domestic policy is static,

Evidence from our eight countries is instructive as to the effects of real exchange rate targeting. As Table 8 shows, three countries--Indonesia, Colombia and Chile--have explicitly attempted to target the real exchange rate. All three had a relatively flat profile for the price of non-tradeables during the period 1989-94, with Indonesia experiencing a small real depreciation, and Colombia and Chile experiencing small real appreciations. An important aspect of policy in these three countries was that they did not simply attempt to target some arbitrary and constant real exchange rate independently of circumstances. Both Colombia and Chile explicitly cited changing fundamentals (oil in Colombia; higher FDI flows in Chile) as reasons for allowing nominal and real appreciation at several junctures over the five-year period. Note also that these attempts at targeting were not free: in the 1990s Chile and Colombia had higher inflation than the other Latin countries, in spite of virtuous fiscal policies. The same is true if we compare Indonesia with Thailand and Malaysia. *In short, an accommodating nominal exchange rate policy may be able to limit real appreciation over the short-to-medium run, though probably at some expense in terms of inflation.*

VI. Lending Booms, Banking Crises and Currency Crises

Our empirical work suggests that countries that experienced lending booms were more likely to suffer currency crises when the Tequila shock hit. In this section we examine possible reasons why this might be so, and ask why is it that some countries experienced lending booms while others did not. Were lending booms caused by big capital inflows? By financial liberalization?

The observation that banking and currency difficulties often go hand in hand is hardly new: the link has been present in crises ranging from that of the U.S. in the 1930s to that of Chile in the early 1980s.²⁶ Theoretically, the link between these "twin crises" is not hard to ascertain. Abrupt changes in the demand for money (caused, for instance, by expectations of devaluation and an incipient speculative attack) can cause a sharp fall in bank deposits. But under a fractional reserve system, banks do not have sufficient cash in hand to cover their liabilities: in the absence of an injection of liquidity from the outside (typically from the Central Bank), cessation of payments and a bank panic can occur easily. Even if banks could simply wait until loans mature in order to satisfy depositor's demands (which would take time, given banks' essential role as maturity transformers), the ensuing adjustment would not be easy or painless. The resulting

consumption and the current account will undergo a welfare-reducing fluctuation. If, by contrast, the domestic rate of crawl is temporarily increased to offset the foreign shock, domestic consumption will be flat, the current account will always be balanced, and welfare will be higher.

²⁶Wigmore (1987) has argued that the failure of the Fed to protect the U.S. banking system in the winter of 1932-33 was the result of the Fed's fears that providing lender-of-last-resort credit to the banks would undermine the U.S. dollar's link to gold. In Chile in 1982, high interest rates under a fixed exchange rate helped precipitate a banking collapse. The associated expansion of domestic credit contributed to the demise of the exchange rate peg. See Velasco (1991), in the volume edited by Baliño and Sundarajan, for details.

credit squeeze on borrowing firms would send interest rates sky-high. In emerging markets banks are the main sources of corporate credit, and most firms cannot simply turn around and borrow from the world market, no matter how de-regulated the capital account may be. The need to avoid a wave of bankruptcies and serious economic disruption provides yet another reason for the authorities to step in.

One upshot of this situation is that the monetary base is not the only claim on the Central Bank that can be called in in times of trouble. The reality is that, with bank liabilities covered by implicit or explicit government guarantees, all M2 is potentially a liability of the Central Bank. Therefore, the expansion of liquidity generated by a bank run can feed a speculative attack on the reserves of the Central Bank.

What determines bank weakness? Bank portfolios can be weakened suddenly by an exogenous shock. But bad luck is not the only culprit. More often than not, portfolios are weakened endogenously by swift expansions of credit, with boom leading to bust. As Hausmann and Gavin (1995) persuasively argue, the empirical link between lending booms and financial crises is very strong. Rapid growth in the ratio of bank credit to GDP preceded financial troubles in Argentina (1981), Chile (1981-82), Colombia (1982-83), Uruguay (1982), Norway (1987), Finland (1991-92), Japan (1992-93), and Sweden (1991). Among the countries in our group of eight, during the period 1990-94 substantial lending growth happened in Argentina, Mexico, and the Philippines, which were the countries that experienced the greatest increases in their crisis indexes during 1995. In contrast, Indonesia and Malaysia, hit the least severely by the Tequila shock, did not experience lending booms.

With regard to lending booms, it is extremely important to distinguish levels from rates of increase. All Asian countries except the Philippines show very high ratios of private sector credit to output. This indicates nothing but financial deepening, and in and of itself is no cause for concern. What is worrisome are sharp increases in lending to the private sector within a short period of time. Such jumps are likely to lower average loan quality.

Why did lending booms happen in the countries in our sample? A commonly cited culprit is swift liberalization of the capital account, followed by a surge in inflows which presumably get intermediated by the banking sector. But there are two problems with this explanation. While incremental moves toward liberalization have been happening in all of the countries in the sample, the capital account in almost all of them has been quite open for a long time.²⁷ For instance, Indonesia defied conventional wisdom by liberalizing its capital account in the 1970s, well ahead of its current account; Mexico, except for a brief period of controls at the time of the 1982 crisis, has always remained open to capital movements. The two partial exceptions are Colombia and Chile, and even they have reasonably open capital accounts by any measure. It is difficult then, to draw a clear link between drastic policy change on the external front and a subsequent lending boom.

²⁷See Table 8 for greater detail.

The other problem with this line of argument is that there is no obvious correlation between the size of the capital inflow and the ensuing behavior of bank credit. The correlation seems to exist in the case of Mexico --where both capital inflows and bank lending grew tremendously-- but not elsewhere. Countries like Malaysia and Chile experienced very large capital account surpluses without an obvious impact on bank behavior.²⁸ To a lesser extent, so did Colombia.

But if capital account liberalization does not seem to have played a role in causing lending booms, domestic financial liberalization does appear to have been influential. Financial liberalization typically is accompanied by more aggressive behavior on the part of banks. In order to raise more deposits banks increase interest rates and fund more risky projects. Since deposit insurance (implicit or explicit) exists, depositors find it profitable to move to these banks. Of course, the purpose of prudential regulation is to impede this tendency. However, during the early years of liberalization oversight capacity is usually poor. Consequently, when significant capital inflows take place in the early stages of financial liberalization, the lending boom that follows is likely to be associated with an increase in the riskiness of banks' portfolios. Moreover, since lending is expanding rapidly it is difficult to determine the paying capacity of borrowers who can borrow easily to repay old debts. The weaknesses of the banking system do not surface until capital inflows reverse.

By the late 1970s and early 1980s a progression from bank privatization and deregulation to lending boom to eventual bust had been observed in a number of countries. In Latin America, Argentina, Chile and Colombia had gone through this cycle.²⁹ In Asia, the same was true for Indonesia and Malaysia.³⁰ For example, the cycle appeared in 1989-90 when financial liberalization in Indonesia was followed by a lending boom. In Mexico, privatization and deregulation of the banking system in the early 1990s had a similar effect.

The type of deregulation implemented also made a difference. Colombia, for instance, launched a wide-ranging program to modernize the financial system in 1990.³¹ Barriers to entry were relaxed, reserve requirements were rationalized, and most (but not all) interest rates were

²⁸Calvo, Leiderman and Reinhart (1993) offer the intriguing conjecture that the composition of capital flows is important in this regard: FDI is typically not intermediated by the banking system, while others flow are. To some extent, this may explain the behavior of Malaysia (where a massive FDI boom took place) and Chile (which had the largest FDI increase in Latin America).

²⁹See Baliño and Sundarajan (1991) for studies from a set of countries, including Argentina, Chile, Uruguay and the Philippines.

³⁰See the essay by Folkerts-Landau, Schinasi, Cassard, Ng, Reinhart and Spencer in Kahn and Reinhart (1995).

³¹See Psacharopoulos (1992).

freed. But at the same time supervision was strengthened and all banks were forced to comply with the capitalization standards of the Basel Accord. Previous experiences helped determine countries' policy stances. Both Chile and Colombia had experienced credit booms and financial crises in the early 1980s, which led to bank interventions, liquidations, and bailouts --at a substantial cost to tax-payers. The lesson from these episodes was deeply ingrained in policymakers' minds, and in subsequent years both governments made the enhancement of bank supervision a priority. Bank problems following liberalization in Indonesia and Malaysia in the late 1970s and early 1980s caused these countries as well to pay greater attention to bank oversight. The strong performance of all four countries in 1995 rewarded this policy emphasis.

In 1989-94, countries' attitudes toward bank regulation and oversight varied widely. The difference was not a dichotomy between *laissez faire* and thorough-going interventionism, for no country among our eight falls into the latter category for this period. Rather, the difference was that some countries --Malaysia, Thailand, and, to a lesser extent, Indonesia, the Philippines, Colombia and Chile-- intervened at the margin to discourage bank activities viewed as potentially too risky, and some did not. The Asian countries in particular resorted to specific limits on commercial bank borrowing abroad and to ceilings on domestic re-lending in areas such as consumer and real estate credits.³² All of these countries, to varying degrees, resorted to sterilization and changes in reserve requirements in an effort to limit credit growth. Sterilization seems to have been particularly important in Indonesia, Malaysia and Thailand. In these countries periods of aggressive sterilization coincided with low growth in bank assets, and periods of relaxation of sterilization coincided with quick expansions.³³

A third possible cause of a lending boom is a recent stabilization episode. Deposits are highly correlated with money demand, and therefore with expected inflation. When a policy turnaround puts an end to hyper-inflation, deposits swell and so do bank loans. This effect, which is nothing but a beneficial payoff (greater financial intermediation) from stabilization, probably explains some of the sharp increase in lending that occurred in Argentina, for example. It does not, however, explain the experience of Mexico, where stabilization occurred in 1988-89 and an increase in credit did not occur until the period 1991-94.

³²In Malaysia, measures to limit the credit-creating capacities of banks --in particular, restrictions on consumption credits (such as credit cards and credit for the purchase of motor vehicles)-- were instituted in 1993. In Indonesia, commercial banks' prudential regulation was tightened in 1991 --in particular by a raising of the required capital/asset ratio. Measures to discourage external borrowing, such as limits on commercial banks' foreign currency exposure and external loans, were also instituted. Thailand also created disincentives to foreign borrowing: in 1990 a 10% withholding tax on interest paid on foreign loans was reinstated (after being suspended for two years). In addition, Thai authorities set limits on banks' re-lending capacity, particularly to "non-productive" activities such as consumer loans and luxury real estate.

³³See IMF (1995).

VII. Conclusions

Are currency and financial crises inevitable punishments that follow countries' misdeeds? Or are they simply prompted by contagion and animal spirits, thereby hitting guilty and innocent countries alike? In this paper we have examined these questions by analyzing how 20 emerging markets fared in the Tequila crisis and its aftermath. Our main conclusion is that some degree of previous misbehavior was a necessary condition for crisis: this misbehavior took the form of overvalued real exchange rates and recent lending booms, coupled with low reserves relative to the Central Bank's short term commitments. In the absence of these fundamental weaknesses contagion was at worst short-lived, and the Tequila effect left no hangover behind. At the same time, however, an important element of self-fulfilling panic, or contagion, is evident in the aftermath of the Mexican crisis. Crises that could have occurred, did not, before the Mexican events. Most visibly, the Argentine banking crisis of March-April 1995 almost surely would not have occurred without the provocation of Tequila.

We also found that some common explanations for the occurrence of financial crises are not supported by the data from our sample of 20 emerging markets. The behavior, during the period 1990-94, of current accounts, the size of capital inflows and fiscal policy stances in and of themselves do not help explain why some countries experienced greater financial crises than others in the aftermath of the December devaluation. Any explanatory power these variables do have is through their effect on the real exchange rate and credit to the private sector. For instance, the average current account deficit of hard-hit Argentina was 1%, while the deficit of Malaysia (which did not experience a crisis) was 5%. Similarly, Argentina experienced capital inflows averaging only 2.3% per year, while in Malaysia they were 11.4%.

Prudence in managing both exchange rates and banking systems, then, seemed to pay off. But this conclusion immediately begs the question of how overvaluation and lending frenzies can best be avoided. A striking fact in the data is that large capital inflows were associated with massive real appreciation in some countries, and actually with real depreciation in others. Asian countries in particular seem to have been able to absorb large quantities of foreign resources as a percent of GDP without experiencing sharp changes in relative prices. Some of this probably has to do with their exercise of offsetting fiscal restraint. The performances of Chile, Colombia and Indonesia seem to suggest that flexible and pragmatic management of the nominal exchange rate also matters. Finally, underlying economic structure may play a role: we have provided some preliminary evidence to suggest that countries with large labor-intensive tradeables sectors find it easier to reallocate labor between tradeables and nontradeables without inciting massive shifts in relative prices.

We have also seen that large inflows of foreign capital need not cause a frenzy in bank lending and a growing stock of bad loans, as the experiences of countries as different as Malaysia and Chile show. The domestic regulatory environment is more crucial in determining whether or not crisis will occur, but here the policy questions are many. In particular, the capital adequacy

and liquidity standards typically emphasized in developed economies may not be sufficient to regulate the volatile environment of emerging markets. Much more must be learned --and carried out by vigilant regulators-- if we are to avoid further repetitions of the boom and bust financial cycle.

Appendix: Country Summaries

Malaysia³⁴

Policy and performance in 1989-94

In 1985 Malaysia experienced a small recession (1 percent drop in output), largely due to the sharp drop in oil prices at that time. The government responded with micro liberalization (labor market, tax relief) measures aimed at improving the investment climate. Both portfolio and direct foreign direct investment restrictions were also lifted at the time. Higher investment and growth followed. Interestingly, this coincided with large current account surpluses in 1987-88, as domestic savings increased sharply.

Starting in 1989 Malaysia experienced a vast surge in capital inflows: a positive balance in the capital account of US \$1.5 billion (2.4% of GDP) grew systematically thereafter, peaking at an extraordinary US \$9.6 billion (22.3% of GDP) in 1993. The bulk of this capital was long-term (both public and private), but in 92-93 as much as one third of the total was short term. Particularly remarkable is the performance of direct foreign investment which in 91-94 averaged 7.9% of GDP.

The policy response to the capital inflow involved:

- o A managed float for the exchange rate, which lead to heavy intervention on the part of the Central Bank at times of particularly large inflows. While there was no explicit commitment to target the real exchange rate, Central Bank intervention actively limited real swings.
- o Very aggressive sterilization, using both increases in required bank reserves (starting in 1989 and again several times through 1994), as well as more conventional open market operations.
- o In addition, Malaysia repeatedly moved government funds from the commercial banks to the Central Bank as a form of indirect sterilization
- o Direct measures to limit the credit-creating capacities of banks were also used --in particular, restrictions on consumption credits (such as credit cards and purchase of motor

³⁴ See Corbo and Hernandez (1994), Schadler et al (1993), Khan and Reinhart (1995), IMF (1995), IMF RED (1994).

vehicles) were instituted in 1993.

- o A fiscal contraction, which reduced the fiscal deficit from 11.4% of GDP in 1986 to a surplus of 0.2% of GDP in 1993. Government consumption dropped by about 4% of GDP in this period.

- o Starting in 1992, some forms of capital controls were instituted: in particular, non-trade-related swaps by commercial banks were limited. In early 1994, a battery of capital controls on short-term inflows followed: banking institutions faced limits on their non-trade or non-investment-related external liabilities; residents were prohibited from selling short-term financial instruments to non-residents; commercial banks were forced to deposit at the Central Bank the deposits made by foreign financial institutions.

Macroeconomic performance was characterized by:

- o Large and somewhat erratic current account deficits, which swung from a small surplus in 1989 to a deficit of 8.9% of GDP in 1991, only to fall in the next two years and to increase again to 5.9% of GDP in 1994.

- o Since the net balance of capital account often far exceeded the current account deficit, and since the Central Bank intervened actively in currency markets, reserves accumulated sharply, reaching 7.1% of GDP in 1993.

- o Remarkably, the real exchange rate appreciated somewhat in 1989-91, but then began depreciating in real terms. A sharp nominal depreciation, engineered by the Central Bank, occurred in early 1994. By year-end 1994 the real exchange rate was 12.5% below its 1985-89 average level.

- o Interest rates increased somewhat in the period of heavy sterilization (especially from late 1991 to mid-1993) and fell for the next two quarters. They rose again, and so did the corresponding cross border differential, in early 1994, helping prompt the decision to impose capital controls.

- o There was no lending boom by commercial banks. Lending to the private sector by banks declined as a proportion of total bank assets. As a share of GDP, total lending to the private sector only increased from 66.7% in 1989 to 75.3% in 1994.

- o Inflation remained low and stable, in spite of the heavy inflows and reserve accumulation.

Performance in 1995

In mid January the currency came under speculative pressures --which proved short-lived as the Central Bank sharply increased interest rates. The Central bank spent about US \$500

million in defense of the currency between December and February, but reserves recovered thereafter. Measured in dollars, stock prices fell from late-December mid-January, but recovered sharply thereafter, continuing to rise throughout 1995. By mid-year the decline had been more than fully offset. Of all four Asian countries considered here, Malaysia came under the least strain in early 1995.

Indonesia³⁵

Policy and performance in 1989-94

Indonesia, much as fellow oil-exporter Malaysia, faced external difficulties in the mid-1980s, to which it responded with major devaluations in 1983 and 1986. The appreciation of the yen --the currency in which much of external debt was denominated-- also brought a sharp increase in debt-GDP ratios. In 1988 Indonesia implemented a thorough financial and investment liberalization. Liberalization of capital and dividend repatriation for foreign capital was included. The years that followed witnessed a investment boom, both foreign and domestic. Economic growth accelerated accordingly.

Capital inflows were concentrated in two episodes. First in 1986-87, when the tight fiscal and monetary policies that accompanied the devaluation increased interest rates; the capital account surplus reached 5.2% of GDP in 1986 and 4.6 in 1987. During this period there was an accelerated expansion of domestic lending and a sharp increase in asset prices. As interest rates came down in the late 1980s portfolio and other short-term flows decelerated --though FDI continued slowly to increase, reaching 1% of GDP in 1990. The second inflow episode took place in 1990-92 (and to a lesser extent in 94): in those first 3 years the capital account surplus averaged 4% of GDP.

The policy response to the second capital inflow episode included:

- o Sharp monetary tightening starting in 1991, accomplished largely by open-market operations involving Central Bank debt certificates.
- o Heavy sterilization from early 1991 to mid-1993. During this period the outstanding stock of Central Bank certificates grew sharply. Public enterprise deposits (equivalent to 25% of base money) were transferred to the Central Bank from commercial banks.
- o Measures to discourage external borrowing: limits on commercial banks foreign currency exposure and external loans; annual ceilings on public enterprises' borrowing abroad; the Central Bank made it more difficult to use its own swap facilities as a hedge

³⁵ See Corbo and Hernandez (1994), Schadler et al (1993), Khan and Reinhart (1995), IMF (1995), IMF RED (1994).

when borrowing abroad. Such measures were taken in spite of Indonesia's long-standing commitment to the openness of its capital account, first liberalized in 1971.

- o Tightening of commercial banks' prudential regulation in 1991 --in particular by raising the required capital/asset ratio.

- o A crawling peg exchange rate system, which operates with the explicit objective of targeting the real exchange rate. The system has been made somewhat more flexible in 1993-94, with the Central Bank increasing the spread between its selling and buying rates (creating a de facto band).

- o A mild fiscal tightening, which took the overall fiscal deficit from 0.9% of GDP in the fiscal year 1989/90 to a surplus of 2.2% in 1990/91. In the following years very small deficits returned, averaging 0.8% of GDP between 1991/92 and 1993/94. Overall, Indonesia stuck to its tradition of balanced or near-balanced budgets.

Macroeconomic performance was characterized by:

- o Moderate current account deficits in 1990-94, which were much smaller than the corresponding capital account surpluses. As a result, reserves accumulated sharply, going from US \$5 billion in mid-1990 to US \$11 billion at the end of 1994.

- o The real exchange rate appreciated slightly in 1988-91 and depreciated thereafter. By the end of 1994 the real exchange rate was 16.2% below its 1985-89 average level.

- o A credit boom in 1989-90, which was reversed when the authorities tightened monetary policies and bank regulations starting in 1991. Credit growth became high again in 1993/94 and thereafter, as monetary policy became looser and some of the constraints on bank behavior were relaxed. Overall, credit to the private sector went from 36.1% of GDP in 1989 to 51.2% in 1994.

- o Remarkably high and stable economic growth in the first 5 fiscal years of the decade. Inflation remained below 10% per annum throughout.

Performance in 1995

There were incipient capital outflows as rumors of devaluation spread after the Mexican crash. Traders cited concerns over Indonesia's external debt, which stood at roughly 60% of GDP. The authorities dealt with the shock by slightly raising interest rates and pursuing active intervention. About US \$700 million were spent in defense of the currency. Coupled with statements of reassurance from the authorities, the policy worked in that the outflows proved short-lived.

Something similar happened with asset prices. The stock market dropped for the first 4

months of 1995, but then recovered sharply. By year-end 1995 the index (measured in dollars) was 22% above its November 94 level.

Philippines³⁶

Policy and performance in 1989-94

While the Philippines has also experienced large capital inflows, the timing of the process has been somewhat different than in other large capital recipients, both in Asia and in Latin America. Lingering political instability, external debt problems (a bank debt agreement was not finalized until the end of 1992) and loose fiscal policies in the 1980s delayed the surge in inflows. Capital began flowing in 1990, and this process was helped subsequently by the liberalization of foreign investment regulations in 1991 and of exchange arrangements (both current and capital account) in 1992. But it was not until 1991 that the Philippines began receiving inflows that were large relative to its current account deficits. Liberalization of the capital account had begun in 1988, but it was intensified in 1992.

The policy response to the capital inflow included:

- o Conventional sterilization beginning in 1990, as the Central Bank began selling domestic securities to counteract the increase in liquidity. Such efforts were intensified in 1992 through the issuance of Central Bank bills and Central Bank borrowing through a reverse repurchase facility. Sterilization slowed down in mid-1993.
- o Sterilization was also pursued by increasing bank reserve requirements --most notably in 1990, when they were raised by 4 percentage points to 25%-- and by having the treasury place deposits with the Central Bank instead of commercial banks, especially at two junctures in 1992 and 1994. The policy of increasing reserve requirements was later reversed; required reserves were lowered to 20% and then to 17% in August 1994, as the Central Bank attempted to bring down interest rates.
- o A dirty float of the exchange rate, with occasional Central Bank intervention. Such intervention was curtailed in mid 1992 when the authorities decided to allow a nominal appreciation of the peso. The trend toward greater exchange rate flexibility was reversed in mid-1994, as the Central Bank switched to greater nominal targeting in an effort to limit appreciation.
- o Bank regulations were liberalized in 1993-94: limitations on new branches and on ATMs were lifted in 1993, and 10 foreign banks were allowed to enter the market for the

³⁶ See Corbo and Hernandez (1994), Schadler et al (1993), Khan and Reinhart (1995), IMF (1995), IMF RED (1995).

first time the following year. A number of other smaller changes tended to increase financial activity and intermediation.

- o Starting in mid-1994 some measures were taken to discourage foreign borrowing, particularly by commercial banks: in July, regulations were tightened on all forward cover transactions; in November, limits were lowered on the foreign exposure of commercial banks, and foreign loans were limited thereafter for all agents except exporters and the public sector.

- o The Central Bank was restructured and recapitalized in 1993. Its ability to issue its own securities, rather than having to rely on treasury bills to conduct open market operations, gave it more operating autonomy.

- o Money growth was substantially curtailed in 1992, with the corresponding effect in inflation. Policy again became expansionary starting in mid-1994, with base money growing by almost 20 percent in the year as a whole.

- o While in the 1990s fiscal policy has been considerably tighter than in the previous decade (during 1991-1994 the public sector deficit excluding privatization receipts averaged 2.6% of GDP) there was no explicit effort to tighten in order to offset the expansionary effects of capital inflows.

Macroeconomic performance was characterized by:

- o Current account deficits were variable and often large. After a deficit of 6.1% of GDP in 1990, the current account contracted to a deficit around 2% in the next two years, returning to a large (6% of GDP) deficit in 1993 and 4.3% in 1994. The surplus on the capital account was larger than current deficits in 1993 and 1994, though portfolio flows declined substantially in 1994.

- o While FDI tended to grow throughout the early 1990s, it was not until 1994 that it became a large net source of inflows. That year FDI accounted for almost 3% of GDP.

- o Some real exchange rate appreciation starting in 1987 and accelerating in 1992. By 1994, the real exchange rate had appreciated by 13.8% with respect to the 1985-89 average.

- o Quick rise in different indicators of financial intermediation, and in particular in lending to the private sector, which rose (as a share of GDP) from 16.2% in 1989 to 28.5% in 1994.

- o A sharp fall in inflation after 1991, with prices rising at an average of 8.5% per annum in 1992-94, and little variability in the inflation rate.

- o Slow growth early in the decade, but a pickup in 1994-95.

Performance in 1995

The Philippines was the Asian country most deeply affected by the Tequila effect. Capital flight by small investors amounted to about US \$1 billion in the first quarter, while residents' portfolio investment showed an outflow of US \$500 million.

The peso came under strong selling pressure, which lasted well into the first quarter -- longer than in any other Asian country. The nominal exchange rate ... Stock prices also fell sharply in the first quarter. By April 1995, the stock indexed measured in dollars stood 16.7% percent its previous November level --the worst such performance among the Asian countries considered here.

Capital outflows were met by foreign exchange intervention by the Central Bank, leading to a first quarter net reserve loss of US \$550 million. Monetary policy was tightened in March-April, contributing to end the outflows. By the end of the second quarter reserves had been rebuilt, and they stood US \$160 million above their level at the end of 1994. Stock prices, measured in dollars, also began recovering in late March, and by the end of the year had almost totally recouped its earlier losses.

Thailand³⁷

Policy and performance in 1989-94

Thailand has received extraordinarily large capital inflows starting in 1988 --the year that dividend and principal repatriation for foreign capital were liberalized. In 1988-93 the surplus on the capital account averaged an extraordinary 9% of GDP. Two stages are distinguishable during the period of inflows. The years 1988-90 witnessed an investment boom, very high growth (average over 12% per annum), and slightly increasing inflation. In 1991 and thereafter a slight deceleration took place, largely as a result of domestic political uncertainty; growth fell to the 8-8.5% range, and inflation decreased.

The policy response to the capital inflow included:

- o Heavy conventional sterilization by means of open market operations, particularly in 1989-91. The discount rate was increased sharply and commercial banks' access to refinancing facilities at the Central Bank curtailed. Sterilization efforts were reduced in

³⁷ See Corbo and Hernandez (1994), Schadler et al (1993), Khan and Reinhart (1995), IMF (1995).

mid-1993.

- o In 1987-92, a sharp increase in the share of government deposits held at the Central Bank rather than at commercial banks.
- o A fixed exchange rate against a basket of currencies since 1986.
- o Limits on banks re-lending capacity, particularly to "non-productive" activities such as consumer loans and luxury real estate.
- o Disincentives to foreign borrowing: in 1990 a 10% withholding tax on interest paid on foreign loans was reinstated (after being suspended for two years).
- o Liberalization of capital outflows in April 1991: residents were allowed to export capital for investment purposes, and to keep foreign currency accounts with commercial banks in Thailand.
- o A massive fiscal adjustment: fiscal accounts moved from a deficit of 1.4% of GDP in 1988 to a surplus of 4.7% in 1991.

Macroeconomic performance was characterized by:

- o Current account deficits have grown sharply since 1988 --peaking at 8.5% of GDP in 1990 and declining thereafter-- but have remained far below the corresponding capital account surpluses. As a result, reserves have accumulated quickly.
- o Remarkably little real exchange rate movement, particularly given the size of the inflows. In fact, the real exchange rate depreciated slightly in the mid-to-late 1980s, and began appreciating very slowly since. Comparing 1994 and the 1985-89 average, the accumulated appreciation amounted to just 0.9%.
- o FDI flows have not been negligible (in the 2% of GDP range since 1988), but they have clearly been swamped by other kinds of mobile capital --particularly portfolio investment, which in 1993 flew in to the tune of 4.4% of GDP.
- o Financial intermediation expanded gradually: M2 as share of GDP went from 55.6 in 1989 to 68.9% in 1994. Credit to the private sector as a share of GDP shows higher growth: from 55.3 to 90.5% of GDP in the same period.
- o A remarkably strong macro performance as measured by inflation and growth. The former has been relatively steady at around 4.9% per annum, while growth has averaged an extraordinary 9.5% in 1989-94.

Performance in 1995

In spite of a strong reserve position and stellar macroeconomic performance, the Thai baht also came under speculative pressures in early 1995. Speculation proved short-lived, however, as the authorities intervened to keep the peg in place. A reserve loss of just US \$375 million in January was sufficient to restore confidence.

Stock prices, measured in dollars, remained reasonably unaffected by the events in Mexico and elsewhere. After a slight dip the index began to recover, and stood by May 6% above its November 94 level.

Colombia³⁸

Policy and performance in 1989-94

Colombia's tradition of prudent macroeconomic management and a performance lacking in sharp fluctuations continued in the early 1990s. The new administration that took office in August 1990 undertook a broad program of liberalization and reform, including trade and fiscal reform and foreign investment deregulation. Portfolio and DFI restrictions were first eased in 1989, and the liberalization deepened in 1991. It also implemented a monetary and fiscal tightening in response to a perceived acceleration in inflation.

Private capital inflows began in earnest in 1991, attracted in part by the high interest rates caused by the tighter monetary stance, and also by the ongoing process of liberalization. The capital account posted a moderate surplus in 1992 and then turned out much larger surpluses in 1993 and 1994, averaging 4.4% of GDP. An investment grade rating received in 1993 (the second in Latin America after Chile's) was one of the factors stimulating the inflows thereafter. The 1993 discovery of large oil reserves, income from which is projected to grow sharply in the next five years, probably changed estimates of national wealth and helped increase current account deficits and their associated financing.

The policy response to the capital inflow included:

- o Heavy sterilization by means of open market operations, especially in the course of 1991.
- o Sterilization by means of increases in reserve requirements, also implemented in 1991.
- o Sterilization was reduced after one year (1991) of intense intervention reportedly because of a) ongoing high interest rates were attracting additional inflows and b) the quasi-fiscal costs were mounting. However, some forms of sterilization were reintroduced in 1994. In particular, government income from privatization and license sales, and

³⁸See Corbo and Hernandez (1994), IMF (1995), IMF RED (1995).

resources from the National Coffee Fund, were deposited abroad rather than in the domestic banking system.

- o An exchange rate crawl (in place since the late 1960s) with a fairly clear commitment to real exchange rate targeting. The specifics of the system have changed somewhat over time, with a crawling band (15% wide) and a dirty float within it being introduced in January 1994. As the authorities became convinced that some degree of revaluation was justified by fundamentals, the central parity was revalued in June 1991 (2.6%), January 1994 (5%) and December 1994 (7%).

- o Several measures directly to discourage inflows, including a withholding tax on some kinds of foreign exchange receipts (introduced in 1991) and a non-remunerated required deposit equivalent to 47% of all loans less than 18 months' maturity (established in 1993). The reserve requirement was modified in August 1994 to cover all loans of less than five years, with the required percentage to be deposited declining as maturity lengthened. In 1993 it was also required that all import bills be settled within six months --otherwise they were considered debt and thus were subject to the deposit requirement.

- o Limits on public sector borrowing abroad, coupled with the prepayment of some external debt obligations.

- o Gradual liberalization of capital outflows, including reductions (in 1992 and 1994) of the share of export proceeds that must be surrendered at the Central Bank, and increases in the shares of their portfolios that domestic insurance companies and pension funds can invest abroad.

- o Drastic trade liberalization (relevant in this context as a measure to "burn" foreign exchange), which took the average tariff from 43.7% in 1989 to 11.7% in 1992. The tariff phase-down was accomplished in less than half the time than had been originally planned, precisely as a result of the growing inflows.

- o A fairly tight fiscal policy throughout, beginning with a deficit of 2% of GDP in 1989 and gradually reaching a surplus of 0.3% of GDP in 1994.

- o The Central Bank was made independent in 1992.

Macroeconomic performance was characterized by:

- o Real ER depreciation in 1989 and 1990, and moderate appreciation thereafter. Between 1994 and the 1985-89 average, the accumulated appreciation was 6.4%.

- o A sharp swing from substantial current account surpluses in 1990-92 to deficits averaging 4.5% of GDP in 1993-94. A good deal of the swing can plausibly be explained as consumption smoothing in the aftermath of the 1993 oil discoveries.

- o Important reserve accumulation in 1991 and 1992 (about US \$3.5 billion in the two years) but not in the years since: the current account deficits have grown sufficiently to offset the large surpluses in the capital account.

- o Little indication of a lending boom: claims on the private sector as a share of GDP went from 13.8% in 1990 to 18% in 1994. The ratio of M2 to GDP remained relatively stable throughout.

- o A steady but less-than-spectacular inflation and growth performance. Inflation has remained stubbornly in the 20-30% range (though with a slight downward tendency since 1992), while growth has averaged 4.1% in 1989-94.

Performance in 1995

Colombia --along with Chile-- was a Latin American country little affected by the Tequila effect. The stock market (in dollars) actually rose in January and February, and then remained essentially flat for the remaining of the first semester. Reserves actually rose in the first quarter, revealing little selling pressure against the peso.

Mexico³⁹

Performance in 1989-94

Mexico's liberalization and reform program, begun in 1983, has been one of the most comprehensive implemented in the developing world. While fiscal consolidation took place in the mid-1980s, it was not until 1987 that a comprehensive stabilization program was put into place. In December of that year the Solidarity Pact froze prices, wages and the exchange rate through an agreement among government, business and labor unions. Many other reforms have been put into place since 1987. Among them are wide-ranging privatization (including almost all the banking sector), liberalization of foreign investment (in 1988), deregulation at the micro level (transportation, telecommunications, other services), and drastic liberalization culminating with the signing of NAFTA. Private capital inflows began in the late 1980s and grew continually until the December 1994 crisis.

The policy response to the capital inflow included:

- o Partial sterilization by selling government bonds, mostly CETES denominated in domestic currency. In 1994, as is now well known, CETES were largely replaced by dollar-linked Tesobonos.

³⁹See Aspe (1993), Sachs, Tornell and Velasco (1996), Calvo and Mendoza (1996), IMF RED (1995).

- o Reserve requirements for peso deposits were low and falling during much of the period. The only attempt at sterilization through changes in required reserves came in April 1992: a compulsory liquidity ratio of 15% was imposed on banks' dollar liabilities. The corresponding amount had to be invested in liquid securities also denominated in dollars.
- o An exchange rate peg imposed in December 1987 remained in place (except for a minor adjustment in February 1988) until January 1989. The government then instituted a preannounced rate of crawl. With some variations in the speed of crawl (and with the eventual creation of a band around the target rate) the system remained in place until December 1994.
- o Bank privatization and financial liberalization. While the evidence is still scanty, prudential regulation and oversight may well have been insufficient during the capital inflow period. The only prudential measure specifically aimed at minimizing the risks associated with inflows was the April 1992 requirements that foreign currency liabilities amount to no more than 10 percent of commercial banks' loan portfolio.
- o Important fiscal consolidation took place in the 1980s, with the operational fiscal balance going from a deficit of x% in 1982 to a surplus of 1.8 percent of GDP in 1990. The fiscal stance deteriorated slightly thereafter, just as capital inflows mounted. The deterioration was particularly marked in 1994, when the political business cycle dictated a reduction in the surplus to only 0.5% of GDP.
- o The Central Bank was made nominally independent in 199..

The macroeconomic performance was characterized by:

- o Important real appreciation, which accumulated to 30.2% if we compare 1994 and the 1985-89 average.
- o Large and growing current account deficits, which started at 1.4% of GDP in 1988 and increased systematically to 7.6% in 1994. What is striking about these deficits is the degree to which they are driven by a decrease in private savings, with public savings actually increasing and overall investment going up only slightly.
- o Important reserve accumulation in 1990-93, drastically reversed with a loss of almost US \$19 billion in 1994.
- o Fast growth in monetary aggregates during much of the period. Domestic credit growth was particularly swift in 1994, as the authorities attempted to sterilize the effects of the reserve outflow.
- o Rapid growth also in credit, giving rise to a veritable lending boom: credit to the private sector as a share of GDP went from 15.1% in 1989 to 46.3% in 1994. The ratio of M2 to

GDP almost doubled in the same period. These trends were associated with a deterioration in the quality of bank portfolios that rose slowly in 1992-94, and whose full magnitude was revealed by the devaluation and subsequent crisis: in December 1994 9% of bank loans were non performing, and by September 1995 this share had risen to 17%.

- o Important increases in FDI, but an even faster growth in portfolio flows. As a result, the total inflow was increasingly composed of short-term flows in 1993-94.

- o Success in the fight against inflation (which finally hit single digits in 1993 and remained there through 1994), but surprisingly little growth: in spite of the inflows and the many reforms, real growth averaged only 3.1% in 1989-94.

Performance in 1995

A 15% devaluation on December 19, 1994, triggered a subsequent run on the peso and on short-term Mexican government paper. After spending US \$12 billion in December, the Central Bank allowed the peso to float. The nominal exchange rate depreciated sharply, losing about half of its value vis a vis the US dollar before stabilizing somewhat in March. This depreciation took place in spite of a massive increase in both nominal and real interest rates.

Asset prices reacted accordingly. The stock market fell sharply, and even after a slight recovery it stood in April 55% below its level (in dollars) in November 1994. The secondary market prices of Mexico's Brady bonds fell by 18% in the same period.

Argentina⁴⁰

Policy and performance in 1989-94

Inflation in Argentina reached 3080 percent in 1989. During that year and the next two years, the government implemented several short-lived stabilization plans, which had the effect of lowering the inflation rate to less extreme (but still very high) levels. In April 1991 the Convertibility Plan was introduced, which had as its main component not just the fixing of the exchange rate, but also the creation of a currency board and the approval of constitutional amendments setting tight and explicit limits on the ability of the Central Bank to finance fiscal deficits. Since 1991 a broad package of structural reforms has also been introduced. The standard privatization, trade liberalization and micro deregulation measures have been applied with particular zeal. Restrictions on foreign investment had already been eased in 1980, and liberalization was carried forward in the early 1990s. The capital account turned strongly positive in 1991 and the corresponding surplus grew systematically in 1992-93, peaking at 4.4% of GDP in 1993.

⁴⁰See Corbo and Hernandez (1994), IMF (1995), IMF RED (1995).

The policy response to the capital inflow included:

- o A fully pegged exchange rate (in fact, a currency board) vis a vis the US dollar since April 1991. The exchange rate can only be changed by law approved by Congress.
- o As befits a currency board arrangement, no sterilization of any sort since the same date.
- o Complete liberalization of the capital account, and no use whatsoever of capital controls.
- o Sharp fiscal consolidation, with the non-financial public sector's balance (including the provinces) swinging from a deficit of 4.1% of GDP in 1990 to a surplus of 0.1% in 1993. A deficit of 1.2% occurred in 1994, as the interest burden rose and government arrears with pensioners and suppliers were cleared.
- o Some tightening in capitalization and prudential requirements for private commercial banks. Limited ability to do the same in connection with the perennially troubled provincial (state-owned) commercial banks.

Macroeconomic performance was characterized by:

- o Massive real appreciation, which by 1994 had accumulated to 55.6% relative to the 1985-89 average. Since then the real effective exchange rate has depreciated somewhat, mostly as a result of a) very low domestic inflation and b) dollar depreciation vis a vis other major currencies.
- o Growing current account deficits in 1991-94, which peaked in 1994 at 3.5% of GDP. While not of Mexican magnitude, such deficits were nonetheless sufficient to cause concern among policymakers and the financial community.
- o Substantial reliance of short-term capital to finance these deficits, particularly in 1992-93, when short term flows accounted 70% of the total. Nonetheless, foreign direct investment did increase gradually but significantly, reaching 2.4% of GDP in 1993.
- o Rapid growth of credit to the private sector: as a share of GDP it went from 9.3% in 1990 to 17.5% in 1994.
- o Extraordinary success in reducing inflation: after the hyperinflation of 1989, prices were increasing by only 24.9% in 1992, 10.6% in 1993, and 4.2% in 1994. That is to say, Argentina was down at world levels of inflation for the first time in several decades.
- o A sharp expansion in economic activity after the exchange rate-based stabilization plan was adopted: growth averaged a remarkable 7.8% per annum in 1991-94.

Performance in 1995

After Mexico, Argentina was the country most sharply affected by the events of late 1994 and early 1995. An incipient run on the banking system caused 7 percent of deposits to be withdrawn between mid-December and the end of February, and an additional 8 percent in March. International reserves also fell sharply in the early months, with losses peaking at US \$5 million by March. Asset prices also reflected the panic: the stock market (in dollars) fell by 35% between November 1994 and February 1995. The index was not to recover its pre-crisis level until year-end. At first prices of Brady Bonds tumbled sharply. By April, however, secondary market quotes had largely recovered, and stood only 3.3% below their previous November's level.

A full-fledged banking crisis was averted by a) timely reductions in reserve requirements on demand and time deposits and b) the introduction of a limited deposit guarantee scheme. A broad based plan with IMF, World Bank and Inter-American Development Bank support was announced in mid-March, which stopped further reserve losses and restored some investor confidence.

Chile⁴¹

Policy and performance in 1989-94

Chile achieved stabilization and reform much earlier than other Latin American countries: by the mid-to-late 1980s most structural reforms had been completed, growth was in the 5-7% range, and inflation was moderate and falling. Large capital inflows began in 1990, attracted by two domestic factors (and several external ones): a) the successful transition to democratic rule, which arguably reduced the country risk premium, and b) a policy of tight money and high interest rates launched by the newly-independent Central Bank. The process accelerated later, plausibly as a result of stellar macroeconomic performance and the award by Standard and Poor's of Latin America's first investment grade rating (in September of 1992).

The policy response to capital inflows included:

- o Aggressive sterilization, particularly in 1990-92. Indexed Central Bank bonds of several maturities were issued as part of large open-market operations.

- o Sterilization also attempted through: a) the imposition of higher reserve requirements on foreign-currency deposits at commercial banks (20% in January 1992, raised to 30% in September 1992), and b) the transfer of public sector deposits (particularly those of copper giant CODELCO) out of commercial banks and to the Central Bank.

⁴¹See Corbo and Hernandez (1994), IMF (1995), IMF RED (1995).

- o A crawling peg (with a band around it), explicitly aimed at targeting the real exchange rate. However, perceived changes in the equilibrium real exchange rate were accommodated by the authorities through small revaluations of the central parity (five times in 1991-94).
- o Several disincentives to short term capital inflows, the most important of which was a 30% non-remunerated required reserve, to be deposited at the Central Bank during the first year of any credit from abroad (it was later increased to 40%). A minimum stay of one year for all foreign investment (including stock market purchases) was also required. In practice this meant that closed-end country funds was the only way in which foreigners bought into the Chilean stock market.
- o Very tight fiscal policy, with the surplus averaging 1.7% of GDP in 1989-94.

The macroeconomic performance was characterized by:

- o Moderate real appreciation, which by 1994 had accumulated to 9.4% relative to the 1985-89 average.
- o Small current account deficits (and even a small surplus one year), as domestic savings grew sufficiently to finance an investment boom: investment went from about 15% of GDP in the mid-1980s to an average of 27.5% of GDP in 1992-94.
- o A preponderant role for long term capital --and particularly for direct foreign investment, which averaged 1.9% of GDP in 1989-94.
- o Little expansion of credit to the private sector, which as a share of GDP went from 43.4% to 46.9% in 1989-94.
- o Gradual but sustained reduction in inflation, which went from the high 20s, where it had been for the second half of the 1980s, to 8,7% in 1994.

Performance in 1995

The Tequila impact on Chile was slight. The exchange rate actually appreciated in nominal terms by about 10% in the first quarter of 1995. International reserves also increased in the same period, and continued to accumulate throughout the year. The stock market showed some deterioration, but bottomed out in February with only a 12% loss with respect to November 1994. Overall, stock prices did not post real gains in 1995 of the magnitude displayed earlier in the decade. Prices of Chile's sovereign debt hardly budged in the whole episode.

DATA APPENDIX

Real Exchange Rate Depreciation.

We use the percentage change in the weighted average of the bilateral real exchange rates (using CPIs) with respect to the yen, the dollar and the D-mark as a proxy for real exchange rate depreciation. The weights sum to one and are proportional to the bilateral trade shares of Japan, the U.S., and the European Union. The extent of depreciation is measured as the percentage increase in the real exchange rate index between its average during 1986-1989 and its average during 1990-1994. To construct the indexes we computed the trade shares from the Direction of Trade Statistics of the IMF, and we used average nominal exchange rates (line rf from the IFS) and CPIs (line 64 from the IFS). For countries with multiple exchange rates we used the parallel rate. For Venezuela the source was VenEconomia and for India it was The World Currency Yearbook (for 1986-1989) and Country Reports on Economic Policy and Trade Practices (for 1990-1992). Since India abandoned its multiple exchange rate regime in 1993, we used the official rate for years after 1993.

Lending Boom.

For each year we calculated the ratio of claims on the private sector by deposit money banks and monetary authorities (line 32d) to GDP (line 99b). When inflation is high this ratio is biased upward because the available annual figure for claims on the private sector corresponds to the figure for December, while nominal GDP reflects the average price level over the entire year. To correct for this bias we multiplied the biased ratio by the ratio of the average price level to December's price level. When inflation is low this factor is basically one. The variable used in the regression is the percentage change in this ratio from 1990 to 1994 (the period of capital inflows). Claims on the private sector for Indonesia and South Africa were taken from the Asian Development Bank's Key Indicators of Developing Asian and Pacific Countries, and from the South African Reserve Bank's Quarterly Bulletin of Statistics.

M2 over Reserves.

This ratio was calculated for November 1994. To obtain the Reserves figure, we converted Total Reserves Minus Gold (line 11) to national currency, using the average exchange rate for November (rf). For M2, we used the sum of money (line 34) and quasi-money (line 35). For Indonesia the value of M2 was obtained from the Asian Development Bank's Key Indicators of Developing Asian and Pacific Countries, since in the IFS data base this series does not go beyond 1992.

Crisis Index.

The crisis index is the depreciation rate plus the negative of the percentage change in reserves between November 1994 and a given month in 1995. Each of the two components is weighted by its precision over the sum of precisions. Precisions are calculated using ten years of monthly data. India and Venezuela had multiple exchange rates during part of the ten year

period. For India we calculated the precisions using data starting in 1993, the year in which India returned to a single exchange rate regime. For Venezuela we calculated the precisions using data for the parallel rate starting in June 1994, when the country adopted a multiple exchange rate regime.

Current Account

The current account was taken from line 78al of the IFS. It was converted to national currency using the annual average exchange rate (rf). Current account data was not available for the following countries: Argentina (94), Colombia (93,94), India (93,94), Pakistan (94), Philippines (94), and Zimbabwe (94). The missing data were obtained using the countries' RED figures. We measured the REDs as shares of GDP, and entered them in the regression in two different ways: as the average over the period 1990-1994, and as the percentage change from 1990 to 1994. Since for India and Zimbabwe data was not available for 1994, we used 1993 as the end point.

Investment and Savings

To obtain investment and savings measures, we used Gross Fixed Capital Formation (line 93e). We used different sources for Turkey, Zimbabwe and India because National Account data for these countries was not available in the IFS data base for all the years in the period we considered. For Turkey, we used data from the National Accounts Main Aggregates from the OECD's Direction of Statistics. For Zimbabwe we obtained data from the World Tables. Data for India and Zimbabwe for 1994 was not available. We obtained their investment and savings variables for that year using 1993 as the end point. Savings was constructed as the sum of investment plus the current account.

Government Consumption.

We used line 91f. Since data for Argentina was not available it was excluded from the regression that included this variable.

Capital Inflows

We constructed this variable by adding the capital account (78bc), the financial account (line 78bj) and net errors and omissions (line 78ca). The sum was converted to national currency using the annual average exchange rate (we used the IMF's new definition of the balance of payments, from the fifth edition of the Balance of Payments Manual, BPM5). This measure of capital inflows is similar to the "old" definition of the capital account. For Argentina (94), Colombia (93,94), India (93,94), Pakistan (94), Philippines (94), and Zimbabwe (94) data was missing. We used the countries' REDs to complete the series, although even this data was not available for India and Zimbabwe.

Short Term Capital Inflows

The source for the short term capital inflows figures was the IMF's Balance of Payments Statistics. This variable is the sum of Portfolio Investment (line 4600 of the above publication), Errors and Omissions (line 4998) and Other Short Term Flows. The latter variable was constructed by identifying short term flows within the category Other Investments in the IMF's

standard presentation of the capital account (lines 4727, 4733, 4734, 4768, 4771, 4777, 4789, 4792, 4700)

Taiwan.

Our main source for data on Taiwan was the Asian Development Bank's Key Indicators of Developing Asian and Pacific Countries. However, we took the monthly figures for reserves and the nominal exchange rate from Taiwan's Monthly Bulletin of Statistics and The Economist.

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Table 1

Coefficient		Dependent Variable: Change in the Crisis Index from November 1994 to:					
		Jan 95	Feb 95	March 95	April 95	May 95	June 95
C1	constant	-21.927 (33.116)	-21.198 (30.341)	-27.783 (41.622)	-37.039 (36.678)	-32.179 (33.577)	-35.735 (37.724)
C2	RER	3.540 (2.420)	3.818 (2.343)	5.171 (3.046)	6.393 (2.727)	6.992 (2.723)	8.779 (3.665)
C3	LB	1.026 (0.865)	1.089 (0.805)	1.450 (1.071)	1.770 (0.950)	1.739 (0.931)	1.973 (1.143)
C4	RER D ^{LR}	-3.328 (1.948)	-3.692 (1.969)	-5.026 (2.486)	-6.165 (2.276)	-6.774 (2.321)	-8.339 (3.435)
C5	LB D ^{LR}	-4.041 (3.601)	-4.427 (3.287)	-5.565 (4.507)	-6.835 (3.954)	-6.342 (3.655)	-6.730 (4.028)
C6	RER D ^{LR} D ^{WF}	-1.442 (1.407)	-1.577 (1.354)	-3.401 (1.695)	-2.886 (1.542)	-2.821 (1.283)	-2.014 (1.623)
C7	LB D ^{LR} D ^{WF}	5.573 (4.121)	6.053 (3.827)	8.232 (5.100)	8.895 (4.407)	7.998 (3.909)	8.700 (4.507)
R ²		0.516	0.564	0.665	0.690	0.714	0.675
Adjusted R ²		0.292	0.363	0.510	0.546	0.583	0.512

Wald Tests

Null Hypothesis	P-Values					
C2 + C4 = 0	0.71	0.81	0.84	0.72	0.71	0.51
C2 + C4 + C6 = 0	0.38	0.26	0.05	0.07	0.03	0.34
C3 + C5 = 0	0.30	0.21	0.26	0.12	0.13	0.16
C3 + C5 + C7 = 0	0.14	0.11	0.07	0.04	0.03	0.05

Note: Standard error in parenthesis

Table A.1

Robustness to the Definition of the Dummy Variables

Coefficient	(1)	(2)	(3)	(4)	(5)	(6)	(7)
C1 constant	-37.039 (36.678)	-40.382 (37.616)	-40.526 (40.812)	-50.495 (42.128)	-46.666 (37.611)	-54.018 (35.674)	-24.813 (35.729)
C2 RER	6.393 (2.727)	7.096 (3.075)	5.287 (3.133)	2.268 (2.050)	1.405 (0.780)	1.353 (0.647)	-0.515 (1.545)
C3 LB	(1.770) (0.950)	2.007 (1.011)	1.480 (1.112)	0.706 (0.883)	0.402 (0.527)	0.389 (0.468)	0.263 (0.547)
C4 RER D ^{LR}	-6.165 (2.276)	-6.809 (2.740)	-4.998 (2.580)	-1.100 (1.774)	-0.339 (1.082)	-0.089 (1.201)	0.991 (1.404)
C5 LB D ^{LR}	-6.835 (3.954)	-7.352 (3.981)	-6.837 (4.472)	-3.448 (5.180)	-3.004 (4.725)	-3.261 (5.077)	-2.064 (3.399)
C6 RER D ^{LR} D ^{WF}	-2.886 (1.543)	-2.970 (1.550)	-2.963 (1.623)	-4.688 (2.307)	-4.694 (3.467)	-3.946 (3.612)	-7.052 4.605
C7 LB D ^{LR} D ^{WF}	8.895 (4.407)	9.162 (4.555)	9.228 (4.766)	6.597 (5.483)	6.367 (5.195)	7.127 (5.730)	5.119 (3.984)
R ²	0.690	0.684	0.686	0.705	0.703	0.719	0.683
Adjusted R ²	0.546	0.539	0.542	0.569	0.566	0.590	0.537

Wald Tests

Null Hypothesis	P-Values						
C2 + C4 = 0	0.72	0.67	0.68	0.42	0.42	0.35	0.67
C2 + C4 + C6 = 0	0.07	0.07	0.08	0.05	0.25	0.43	0.16
C3 + C5 = 0	0.12	0.11	0.14	0.58	0.57	0.56	0.58
C3 + C5 + C7 = 0	0.04	0.05	0.04	0.04	0.07	0.08	0.07

Notes:

Standard error in parenthesis

(1) Benchmark. (5 countries in highest reserve group, 5 countries in lowest lending boom group and 5 countries in lowest appreciation group)

(2) 4 countries in each group.

(3) 6 countries in each group.

(4) 7 countries in each group.

(5) 8 countries in each group.

(6) 9 countries in each group.

(7) 10 countries in each group.

Table A.2

Robustness to the sample of countries

Coefficient	Sample: All countries except:						
	Mexico	Chile	Colombia	Peru	Brazil	Phillippines	Argentina
C1 constant	-7.012 (14.597)	-37.645 (43.781)	-37.702 (37.191)	-39.728 (37.411)	-34.301 (36.241)	-33.134 (35.771)	-29.297 (33.272)
C2 RER	4.376 (1.541)	6.485 (3.694)	8.318 (5.110)	7.948 (2.986)	6.209 (2.696)	6.131 (2.661)	5.873 (2.495)
C3 LB	1.012 (0.478)	1.797 (1.253)	2.342 (1.568)	0.798 (0.844)	1.701 (0.940)	1.672 (0.929)	1.575 (0.868)
C4 RER D ^{LR}	-4.666 (1.448)	-6.247 (3.069)	-8.078 (4.840)	-7.673 (2.392)	-6.028 (2.251)	-5.970 (2.222)	-5.779 (2.097)
C5 LB D ^{LR}	-3.559 (1.579)	-6.913 (4.864)	-7.463 (4.250)	-6.088 (3.925)	-6.536 (3.907)	-6.409 (3.856)	-5.990 (3.584)
C6 RER D ^{LR} D ^{WF}	-1.643 (0.676)	-2.893 (1.604)	-2.894 (1.566)	-2.918 (1.567)	-3.206 (1.822)	-2.829 (1.587)	-3.663 (2.021)
C7 LB D ^{LR} D ^{WF}	3.988 (1.432)	8.954 (5.092)	8.960 (4.472)	9.158 (4.494)	8.859 (4.231)	8.687 (4.246)	8.296 (3.768)
R ²	0.713	0.683	0.691	0.695	0.702	0.706	0.706
Adjusted R ²	0.570	0.524	0.536	0.542	0.553	0.559	0.559

Wald Tests

Null Hypothesis	P-Values						
C2 + C4 = 0	0.27	0.75	0.71	0.67	0.77	0.79	0.87
C2 + C4 + C6 = 0	0.01	0.08	0.08	0.08	0.10	0.09	0.08
C3 + C5 = 0	0.06	0.19	0.12	0.12	0.137	0.14	0.14
C3 + C5 + C7 = 0	0.01	0.05	0.05	0.05	0.04	0.04	0.03

Note: Standard error in parenthesis

Table 2a

Alternative Hypotheses (I): Average level of the ratio of the variable to GDP during 1990-1994

Coefficient		Variable Tested:					
		Investment	Savings	Government Consumption	Current Account	Capital Inflows	Short-Term Capital Inflows
C1	constant	10.522 (123.931)	110.114 (107.046)	-21.057 (131.344)	-57.588 (38.949)	-54.890 (48.885)	-58.216 (45.430)
C2	RER	4.376 (2.193)	3.187 (2.177)	4.407 (3.036)	8.096 (3.420)	7.885 (3.322)	5.455 (1.450)
C3	LB	1.007 (0.838)	0.395 (0.851)	1.053 (0.934)	2.646 (1.207)	2.350 (1.105)	1.710 (0.735)
C4	RER D ^{LR}	-4.376 (2.193)	-3.187 (2.177)	-4.407 (3.036)	-8.096 (3.420)	-7.885 (3.322)	-5.455 (1.450)
C5	LB D ^{LR}	-1.007 (0.838)	-0.395 (0.851)	-1.053 (0.934)	-2.646 (1.207)	-2.350 (1.105)	-1.710 (0.735)
C6	RER D ^{LR} D ^{WF}	-2.453 (1.497)	-2.477 (1.442)	-3.378 (2.086)	-3.522 (1.420)	-3.371 (1.643)	-3.132 (1.423)
C7	LB D ^{LR} D ^{WF}	3.811 (1.944)	3.435 (1.737)	3.974 (1.720)	3.414 (1.404)	3.602 (1.630)	3.765 (1.686)
C8	variable	-0.941 (5.618)	-5.486 (5.262)	1.244 (14.583)	9.242 (11.755)	-1.857 (6.487)	10.506 (11.777)
C9	var D ^{LR}	0.254 (1.503)	-0.930 1.821	0.300 (5.167)	-25.587 (13.812)	18.109 (11.040)	107.531 (78.752)
C10	var D ^{LR} D ^{WF}	-1.256 3.035	0.476 (2.966)	-2.600 (3.730)	3.057 (10.459)	-10.404 (11.398)	-108.603 (84.384)
R ²		0.696	0.722	0.708	0.735	0.706	0.718
Adjusted R ²		0.518	0.560	0.522	0.580	0.534	0.554

Wald Tests

Null Hypothesis

P-Values

C8 + C9 = 0	0.91	0.31	0.89	0.16	0.28	0.20
C8 + C9 + C10 = 0	0.61	0.16	0.91	0.16	0.40	0.09

Note: Standard error in parenthesis

Table (2b)

Alternative Hypotheses (II): Percent change in the ratio of the variable to GDP from 1990 to 1994

Coefficient		Variable Tested:					
		Investment	Savings	Government Consumption	Current Account	Capital Inflows	Short-Term Capital Inflows
C1	constant	-40.020 (33.880)	-33.855 (27.195)	-26.524 (29.364)	-31.922 (34.165)	-26.548 (30.219)	-41.178 (39.584)
C2	RER	3.565 (1.546)	4.307 (2.572)	7.128 (4.725)	5.687 (2.864)	6.960 (4.425)	9.174 (5.711)
C3	LB	0.204 (0.635)	1.451 (0.860)	2.142 (1.794)	1.523 (0.971)	1.909 (1.390)	2.602 (1.757)
C4	RER D ^{LR}	-3.565 (1.546)	-4.307 (2.572)	-7.128 (4.725)	-5.687 (2.864)	-6.960 (4.425)	-9.174 (5.711)
C5	LB D ^{LR}	-0.204 (0.635)	-1.451 (0.860)	-2.142 (1.794)	-1.523 (0.971)	-0.909 (1.390)	-2.602 (1.757)
C6	RER D ^{LR} D ^{WF}	-2.658 (1.492)	-2.705 (1.557)	-0.368 (1.458)	-2.667 (1.448)	-3.084 (1.405)	-2.488 (1.467)
C7	LB D ^{LR} D ^{WF}	3.782 (1.771)	3.791 (1.664)	3.273 (0.722)	3.685 (1.663)	3.761 (1.610)	3.844 (1.771)
C8	variable	3.468 (2.388)	-1.457 (1.154)	-1.363 (2.182)	-0.018 (0.075)	-0.015 (0.031)	-0.049 (0.061)
C9	var D ^{LR}	-3.389 (5.221)	4.175 (4.499)	-0.382 (2.085)	0.507 (0.995)	0.462 (0.461)	0.130 (0.100)
C10	var D ^{LR} D ^{WF}	0.701 (4.731)	-2.581 (4.894)	9.586 (3.449)	-0.562 (1.162)	-0.570 (0.461)	-0.005 (0.207)
R ²		0.696	0.691	0.830	0.688	0.713	0.692
Adjusted R ²		0.518	0.511	0.722	0.506	0.545	0.513

Wald Tests

Null Hypothesis

P-Values

C8 + C9 = 0	0.98	0.54	0.28	0.63	0.35	0.26
C8 + C9 + C10 = 0	0.73	0.95	0.03	0.82	0.19	0.75

Note: We imposed restrictions: $C2 + C4 = 0$ and $C3 + C5 = 0$
Standard error in parenthesis

Table 3
Capital Account as a share of GDP

	1989	1990	1991	1992	1993	1994		1989	1990	1991	1992	1993	1994
ARGENTINA (*)							MALAYSIA						
CAPITAL ACCOUNT							CAPITAL ACCOUNT						
Total	-10.4%	-4.1%	0.1%	3.9%	2.9%	2.8%	Total	3.4%	4.1%	11.8%	15.0%	17.0%	2.1%
Direct Investment	1.34%	1.30%	1.29%	1.83%	2.45%	0.5%	Direct Investment	4.4%	5.4%	8.5%	8.9%	7.9%	6.2%
Portfolio Investment	3.4%	-0.9%	0.3%	-0.2%	7.2%	0.6%	Portfolio Investment	-0.3%	-0.6%	0.4%	-1.9%	-1.1%	-2.3%
Other Short run	-4.6%	1.1%	1.1%	2.6%	-10.6%	2.0%	Other Short run	-0.1%	-0.5%	2.1%	2.7%	-1.4%	1.0%
Other	-10.6%	-5.6%	-2.5%	-0.3%	3.8%	-0.2%	Other	-0.7%	-0.3%	0.9%	5.3%	11.5%	-2.8%
Net Errors and Omissions	-0.3%	0.5%	-0.2%	0.1%	0.0%	0.0%	Net Errors and Omissions	-0.9%	2.5%	-0.3%	0.1%	5.4%	-0.7%
TOTAL + ERRORS	-10.7%	-3.6%	-0.1%	4.0%	2.9%	2.8%	TOTAL + ERRORS	2.4%	6.6%	11.5%	15.1%	22.3%	1.4%
COLOMBIA (**)							MEXICO						
CAPITAL ACCOUNT							CAPITAL ACCOUNT						
Total	1.0%	0.1%	-1.9%	0.6%	4.1%	4.8%	Total	0.5%	3.4%	8.7%	8.1%	9.2%	3.4%
Direct Investment	1.0%	0.9%	0.8%	1.3%	1.8%	2.5%	Direct Investment	1.5%	1.1%	1.6%	1.3%	1.2%	2.1%
Portfolio Investment	0.3%	-0.0%	0.2%	0.1%	0.7%	0.8%	Portfolio Investment	0.1%	-1.6%	4.2%	5.7%	7.7%	2.0%
Other Short run	0.1%	0.2%	-0.4%	-0.4%	3.7%	1.6%	Other Short run	-0.4%	-0.4%	0.1%	1.8%	-0.5%	-1.4%
Other	-0.4%	-1.0%	-2.4%	-0.4%	-2.1%	-0.1%	Other	-0.7%	4.4%	2.8%	-0.8%	0.7%	0.6%
Net Errors and Omissions	0.4%	0.2%	0.7%	0.0%	0.4%	0.1%	Net Errors and Omissions	2.2%	0.5%	-0.8%	-0.3%	-0.9%	-0.4%
TOTAL + ERRORS	1.4%	0.2%	-1.3%	0.7%	4.5%	4.9%	TOTAL + ERRORS	2.7%	3.9%	7.9%	7.8%	8.3%	2.9%
CHILE							PHILIPPINES						
CAPITAL ACCOUNT							CAPITAL ACCOUNT						
Total	4.3%	10.0%	2.4%	6.7%	6.1%	8.7%	Total	3.2%	4.6%	6.4%	6.1%	5.6%	7.7%
Direct Investment	4.5%	1.9%	1.2%	0.8%	0.9%	1.7%	Direct Investment	1.3%	1.2%	1.2%	0.4%	1.4%	2.9%
Portfolio Investment	0.3%	1.2%	0.5%	1.1%	1.6%	2.0%	Portfolio Investment	0.7%	-0.1%	0.2%	0.1%	-0.3%	-0.7%
Other Short run	3.2%	4.1%	2.0%	0.9%	2.3%	2.2%	Other Short run	0.1%	0.9%	1.8%	-0.3%	1.0%	0.9%
Other	-3.7%	2.8%	-1.3%	4.1%	1.2%	2.9%	Other	1.1%	2.7%	3.2%	5.9%	3.5%	4.6%
Net Errors and Omissions	-0.4%	-0.5%	0.9%	0.7%	-0.2%	-1.1%	Net Errors and Omissions	0.9%	1.3%	-0.3%	-1.0%	0.5%	0.3%
TOTAL + ERRORS	3.9%	9.6%	3.3%	7.5%	5.9%	7.6%	TOTAL + ERRORS	4.1%	6.0%	6.1%	5.1%	6.1%	8.1%
INDONESIA							THAILAND						
CAPITAL ACCOUNT							CAPITAL ACCOUNT						
Total	3.1%	4.2%	4.9%	4.8%	3.7%	2.2%	Total	9.1%	10.6%	11.9%	8.8%	9.0%	9.9%
Direct Investment	0.6%	1.0%	1.3%	1.4%	1.3%	1.2%	Direct Investment	2.4%	2.7%	1.9%	1.8%	1.2%	0.1%
Portfolio Investment	-0.2%	-0.1%	-0.0%	-0.1%	1.1%	0.6%	Portfolio Investment	2.1%	-0.0%	-0.1%	0.8%	4.4%	1.7%
Other Short run	0.7%	4.4%	2.2%	1.7%	-0.8%	0.5%	Other Short run	2.2%	4.6%	5.6%	3.2%	1.1%	-1.7%
Other	2.0%	-1.1%	1.5%	1.8%	2.0%	-0.2%	Other	2.5%	3.4%	4.5%	3.0%	2.3%	9.7%
Net Errors and Omissions	-1.4%	0.7%	0.1%	-1.0%	-1.9%	-0.2%	Net Errors and Omissions	1.3%	1.7%	0.4%	-0.5%	-0.2%	-1.1%
TOTAL + ERRORS	1.7%	4.9%	5.0%	3.8%	1.7%	2.0%	TOTAL + ERRORS	10.4%	12.3%	12.3%	8.3%	8.7%	8.8%

(*) Source for 1994 : RED.

(**) Source for 1993 , 1994 : IDB

Source : IMF, "Balance of Payments Statistics Yearbook "

- The classification "Other Short run" was constructed identifying short term flows within IMF's category OTHER INVESTMENTS in the fund's standard presentation of the capital account.
- The classification "Other" was constructed as a residual.

Source : IMF, "Balance of Payments Statistics Yearbook "

- The classification "Other Short run" was constructed identifying short term flows within IMF's category OTHER INVESTMENTS in the fund's standard presentation of the capital account.
- The classification "Other" was constructed as a residual.

TABLE 4
Current Account as a share of GDP

	1989	1990	1991	1992	1993	1994
ARGENTINA						
Current Account	-1.7%	3.2%	-0.3%	-2.9%	-2.9%	-2.8% (*)
Investment Savings	15.5%	14.0%	14.6%	16.7%	18.2%	19.9%
	13.8%	17.2%	14.3%	13.8%	15.3%	17.1%
CHILE						
Current Account	-2.5%	-1.8%	0.3%	-1.7%	-4.6%	-1.5%
Investment Savings	25.5%	26.3%	24.5%	26.8%	28.8%	26.8%
	23.0%	24.5%	24.8%	25.1%	24.2%	25.3%
MEXICO						
Current Account	-2.8%	-3.0%	-5.1%	-7.3%	-6.4%	-7.6%
Investment Savings	22.2%	22.8%	23.4%	24.4%	23.2%	23.5%
	19.4%	19.8%	18.3%	17.1%	16.8%	15.8%
COLOMBIA						
Current Account	-0.5%	1.3%	5.7%	2.1%	-4.2%	-4.8% (*)
Investment Savings	20.0%	18.5%	16.0%	17.2%	19.9%	19.8%
	19.5%	19.9%	21.6%	19.3%	15.7%	15.0%
PHILIPPINES						
Current Account	-3.4%	-6.1%	-2.3%	-1.9%	-6.0%	-4.3% (*)
Investment Savings	21.6%	24.2%	20.2%	21.3%	24.0%	24.0%
	18.2%	18.1%	17.9%	19.5%	17.9%	19.7%
THAILAND						
Current Account	-3.5%	-8.5%	-7.7%	-5.7%	-5.6%	-5.9%
Investment Savings	35.1%	41.1%	42.2%	39.6%	39.9%	40.1%
	31.6%	32.6%	34.5%	33.9%	34.3%	34.3%
MALAYSIA						
Current Account	0.8%	-2.0%	-8.9%	-3.7%	-4.4%	-5.9%
Investment Savings	28.6%	31.3%	35.9%	33.5%	35.0%	38.5%
	29.4%	29.3%	27.0%	29.7%	30.6%	32.6%
INDONESIA						
Current Account	-1.2%	-2.8%	-3.7%	-2.2%	-1.3%	-1.6%
Investment Savings	35.2%	36.1%	35.5%	35.9%	33.2%	34.0%
	34.0%	33.3%	31.8%	33.7%	31.9%	32.4%

Source: IMF International Financial Statistics
(*) 1994 IMF RED

TABLE 5

Fiscal Deficit and Government Consumption as a share of GDP

	1989	1990	1991	1992	1993	1994
ARGENTINA						
FISCAL DEFICIT	-0.7%	-4.1%	-3.2%	-0.4%	0.1%	-1.2%
GOVT. CONSUMPTION	NA	NA	NA	NA	NA	NA
CHILE						
FISCAL DEFICIT	1.8%	3.5%	2.5%	3.0%	2.20%	2.2%
GOVT. CONSUMPTION	9.9%	9.8%	9.5%	9.4%	9.7%	9.3%
MEXICO						
FISCAL DEFICIT	-5.0%	-2.8%	-0.2%	1.5%	0.4%	-0.9%
GOVT. CONSUMPTION	8.5%	8.4%	9.0%	10.1%	10.8%	NA
COLOMBIA						
FISCAL DEFICIT	-2.0%	-0.7%	-1.0%	-0.9%	-0.6%	-1.1%
GOVT. CONSUMPTION	10.6%	10.3%	10.3%	11.8%	12.1%	13.6%
PHILIPPINES						
FISCAL DEFICIT	-2.1%	-4.7%	-2.1%	-1.9%	-2.0%	-1.0%
GOVT. CONSUMPTION	9.5%	10.1%	9.9%	9.7%	10.1%	10.8%
THAILAND						
FISCAL DEFICIT	2.9%	4.5%	4.7%	2.8%	2.1%	1.8%
GOVT. CONSUMPTION	9.5%	9.4%	9.3%	10.0%	10.3%	10.1%
MALAYSIA						
FISCAL DEFICIT	-3.4%	-2.2%	-0.7%	-0.6%	-0.7%	-0.4%
GOVT. CONSUMPTION	0.9%	0.8%	0.7%	0.7%	0.8%	0.8%
INDONESIA						
FISCAL DEFICIT	-0.9%	2.1%	-0.5%	-1.5%	-0.5%	0.1%
GOVT. CONSUMPTION	9.4%	9.0%	9.1%	9.5%	9.0%	8.2%

Sources : IMF International Financial Statistics and countries RED.

Table 6

Inflation and GDP Growth

	1989	1990	1991	1992	1993	1994
ARGENTINA						
INFLATION	3079.8%	2314.0%	171.7%	24.9%	10.6%	4.2%
RATE OF GROWTH	-6.2%	0.1%	8.9%	8.7%	6.0%	7.4%
CHILE						
INFLATION	17.0%	26.0%	21.8%	15.4%	12.7%	11.4%
RATE OF GROWTH	9.9%	3.3%	7.3%	10.7%	6.6%	4.2%
MEXICO						
INFLATION	20.0%	26.7%	22.7%	15.5%	9.8%	7.0%
RATE OF GROWTH	3.3%	4.5%	3.6%	2.8%	0.7%	3.5%
COLOMBIA						
INFLATION	25.8%	29.1%	30.4%	27.0%	22.6%	23.8%
RATE OF GROWTH	3.4%	4.3%	2.0%	4.0%	5.2%	5.7%
PHILIPPINES						
INFLATION	12.2%	14.1%	18.7%	8.9%	7.6%	9.1%
RATE OF GROWTH	6.2%	3.0%	-0.5%	0.3%	2.1%	4.4%
THAILAND						
INFLATION	5.4%	5.9%	5.7%	4.1%	3.4%	5.1%
RATE OF GROWTH	12.2%	11.6%	8.4%	7.9%	8.2%	8.5%
MALAYSIA						
INFLATION	2.8%	2.8%	4.4%	4.8%	3.5%	3.7%
RATE OF GROWTH	9.2%	9.7%	8.7%	7.8%	8.3%	8.7%
INDONESIA						
INFLATION	6.4%	7.8%	9.4%	7.5%	9.7%	8.5%
RATE OF GROWTH	7.5%	7.2%	7.0%	6.5%	6.5%	7.3%

Source : IMF International Financial Statistics.
 Inflation computed as the rate of change of CPI (yearly average).

TABLE 7

	Real Exchange Rate % change Av(90-94)/Av(86-89)	Current Account Average (90-94) (%GDP)	Change in Current Account (*) (%GDP)	Capital Account Average (90-94) (%GDP)	Change in Capital Account (*) (% GDP)	Terms of Trade P. Change (89 - '92)	Manufactured Exports Average share of GDP (80-'92)	Government Consumption(*) Average (90-94) (% GDP)	Change in Government Consumption (*) (% GDP)
ARGENTINA	-48.0%	-1.1%	1.2%	1.1%	3.6%	10.9%	1.4%	N.A.	N.A.
MEXICO	-28.5%	-5.9%	-5.2%	6.2%	6.9%	8.3%	4.3%	9.6%	0.8%
Average	-38.2%	-3.5%	-2.0%	3.6%	5.2%	9.6%	2.9%	9.6%	0.8%
PHILIPPINES	-6.7%	-4.1%	-3.5%	6.3%	4.7%	2.0%	13.6%	10.1%	1.5%
CHILE	-7.4%	-1.8%	1.9%	6.8%	10.3%	0.9%	3.6%	9.5%	-1.3%
Average	-7.0%	-3.0%	-0.8%	6.5%	7.5%	1.4%	8.6%	9.8%	0.1%
THAILAND	0.2%	-6.7%	-5.1%	10.1%	5.8%	-3.3%	19.6%	9.8%	-1.3%
COLOMBIA	9.2%	0.0%	-0.2%	1.8%	0.1%	-1.2%	4.5%	11.6%	1.5%
MALAYSIA	9.8%	-5.0%	-8.5%	11.4%	12.3%	-1.1%	43.2%	0.8%	-14.5%
INDONESIA	11.7%	-2.3%	0.3%	3.5%	-0.4%	-0.2%	12.7%	9.0%	-1.4%
Average	7.7%	-3.5%	-3.4%	6.7%	4.5%	-1.5%	20.0%	7.8%	-3.9%

(*) Average 90-94 minus average 86-89.

(*) Mexico only until 1993

Table 8

(1) Instrumental regression:

Dependent Variable :Manufactured Exports / GDP

Number of observations : 20

Method : LS (Heteroskedasticity-Consistent Cov. Matrix.)

Variable	Coefficient	Std. Error	p-value
Constant	0.03164	0.01309	0.0273
Sachs-Warner Openness Index	0.15120	0.07308	0.0541
Population Density	0.00033	0.00014	0.0305
R-squared:	64.19%		
Adjusted R squared:	59.98%		

(2) Main regressions:

Dependent Variable :Real exchange rate variance.

Number of observations : 20

Method : LS (Heteroskedasticity-Consistent Cov. Matrix.)

Variable	Coefficient	Std. Error	p-value
Constant	752.34	319.684	0.0317
Terms of trade variance	0.2427	0.17418	0.1824
Gov.consumption variance	-27621.4	82228.2	0.7413
Proxy for Manufactured Exports/GDP ratio(*)	-1981.98	1195.78	0.1169
R-squared:	19.2 %		
Adjusted R-squared :	4.1 %		

Dependent Variable :Real exchange rate variance.

Number of observations : 20

Method : LS (Heteroskedasticity-Consistent Cov. Matrix.)

Variable	Coefficient	Std. Error	p-value
Constant	727.16	254.961	0.0110
Terms of trade variance	0.2576	0.15051	0.1051
Proxy for Manufactured Exports/GDP ratio(*)	-1915.16	1029.23	0.0802
R-squared:	19.13 %		
Adjusted R-squared :	9.62 %		

(*) Uses Sachs-Warner openness index and population density as instruments.

Period under study : 1980 - 1992.

Table 9: Data

	Index (%) (Nov.-March)	Real Depreciation (%)	Lending Boom (%)	M2/Reserves (Nov. 94)
Argentina	28.514	-48.002	57.124	3.558
Brazil	15.774	-29.594	68.329	3.618
Chile	-1.591	-7.459	13.289	1.394
Colombia	3.614	9.237	20.491	1.503
India	-0.897	43.045	-3.054	6.330
Indonesia	1.079	11.751	0.659	4.559
Jordan	-1.577	35.484	4.185	2.485
Korea	-2.282	-10.346	8.405	6.538
Malaysia	-0.076	9.818	4.048	2.100
Mexico	91.134	-28.507	116.239	9.060
Pakistan	0.698	20.348	-7.731	6.626
Peru	-1.583	-45.369	156.098	1.448
Philippines	6.576	-6.722	49.975	4.101
South Africa	-0.101	-6.797	8.080	21.535
Sri Lanka	1.195	1.174	28.864	1.957
Taiwan	-2.288	16.238	46.000	4.651
Thailand	-0.890	0.216	39.219	3.651
Turkey	-0.460	-12.119	-32.762	3.236
Venezuela	7.866	16.238	-38.535	1.364
Zimbabwe	0.576	44.175	55.677	2.583