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ON CRISIS PREVENTION:
LESSONS FROM MEXICO
AND EAST ASIA

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Working Paper 7233
<http://www.nber.org/papers/w7233>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 1999

This paper is a revised version of a paper presented at the Brookings-World Bank Conference on "Financial Markets and Development: Preventing Crises in Emerging Markets," March 26-27, 1999. I am indebted to Rajesh Chakrabarti, Kyongchul Kim and Alejandro Jara for assistance. All opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

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Crisis Prevention: Lessons from Mexico and East Asia

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NBER Working Paper No. 7233

July 1999

JEL No.F32, F34

ABSTRACT

This paper provides a comparative analysis of the East Asian and Mexican crises, and draws lessons for the emerging economies. Although much of the discussion concentrates on East Asia and Mexico, I also draw on the history of some previous crisis episodes. I argue that in spite of the efforts to understand the anatomy of currency crises, there are still a large number of controversial and unresolved issues. More to the point, I argue that some of the lessons extracted from these crises are based on a misreading of the historical record. As a result, some of the policy implications that have emerged from this debate are, to say the least, questionable. In particular, I make two points: First, I argue that, in general, current account ratios have limited usefulness in determining a country's financial health. Although I fall short of taking the position that the current account is completely irrelevant, I do argue that a rigid interpretation of current account ratios may be highly misleading. Second, I argue that the rapidly growing popularity of controls on capital inflows as a device for reducing external vulnerability is rooted in a misreading of the recent history of external crises.

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“But now, ah now, to learn from crises...”

Walt Whitman

I. Introduction

The East Asian currency crises rocked the conventional wisdom. All of a sudden the world seemed to be on its head. Yesterday’s “miracle” countries became today’s pariahs, and policies that were supposed to be emulated by every emerging nation, and that were pushed with unrestricted enthusiasm by the multilateral institutions, became questionable. The news is replete with stunning stories about bankruptcies, questionable loans, dwindling international reserves, weak banks and plunging currencies. Rescue packages had to be put together in a haste, and the International Monetary Fund had to coordinate bailout after bailout. Figures 1 through 3 present a picture of the East Asian crisis as seen from the perspective of exchange rates, interest rates and stock markets.

To be sure, most observers were aware that Thai finance companies were not completely healthy, and that in Indonesia the succession from Suharto was far from resolved. But the scope and depth of the crises shocked even veteran East Asian analysts. Business executives across the world asked themselves how come their staff-- or those highly regarded consultants, for that matter -- did not forewarn them of the impending collapse of the region.

By mid 1998 market participants were asking where the next crisis would erupt. Russia and Brazil, with large fiscal deficits and overvalued exchange rates, became obvious candidates, and eventually joined the ranks of crises nations. The Russian debacle was particularly traumatic, inflicting heavy losses on a number of large financial institutions. When the Russian moratorium was announced, investors scrambled for cover and safety. The demand for liquidity soared, yields on the US long bond dropped to an all-time low, and interest rate spreads widened significantly, seriously straining the financial markets in the United States and other industrialized countries. The near collapse of *Long Term Capital Management*, and its subsequent rescue by a group of investment houses coordinated by the Federal Reserve Bank of New York, clearly captured the remarkable degree of integration of world financial markets.

By early 1997 a “consensus view” on the causes of the Mexican crises had developed in policy circles. A direct byproduct of this “consensus” was the identification of a set of vulnerability indicators that were supposed to act as early signals of an impending balance of payments crisis. Surprisingly, however, East Asian analysts tended to ignore these Mexican lessons and, thus, underestimated the dangers of a serious collapse in the region. In the aftermath of the East Asian meltdown, there has been a renewed effort by private sector analysts, policy experts, journalists, and academics to better understand the causes behind currency crises. These studies have reinforced, and in some cases amplified, the conclusions previously

reached by analyses of the Mexican crisis, and have concentrated on the role of large external imbalances, volatile capital flows, weak banking systems, loss in confidence, and overvalued exchange rates.¹

The purpose of this paper is to provide a comparative analysis of the East Asian and Mexican crises, and to draw broad lessons that would be helpful to the Latin American nations and other emerging economies. Although much of the discussion concentrates on East Asia and Mexico, I also draw on the history of some previous crisis episodes. I argue that in spite of the efforts to understand the anatomy of currency crises, there are still a large number of controversial and unresolved issues. More to the point, I argue that some of the lessons extracted from this crisis are based on a misreading of the historical record. As a result, some of the policy implications that have emerged from this debate are, to say the least, questionable. In particular, I make two points: First, I argue that, in general, current account ratios have limited usefulness in determining a country's financial health. Although I fall short of taking the position that the current account is completely irrelevant, I do argue that a rigid interpretation of current account ratios may be highly misleading. Second, I argue that the rapidly growing popularity of controls on capital inflows as a device for reducing external vulnerability is rooted on a misreading of the recent history of external crises, and in particular on a misunderstanding of some key Latin American experiences.

The paper is organized as follows: Section I is the introduction. In Section II I discuss what I have called, for lack of a better term, the "consensus view" on the Mexican crisis, and I investigate the extent to which the lessons from this consensus view were applicable to the East Asian nations. In this section I also discuss the way in which the developments in East Asia during 1997-98 have, in turn, affected this "consensus view" on crisis prevention. In section III I discuss the relationship between current account deficits and currency crises. Section IV is devoted to a discussion of the effectiveness of capital controls. Finally, in section V I deal with some unresolved issues, and I emphasize Latin American lessons, from the 1980s debt crisis, on corporate and financial restructuring. There is also a data appendix with some key data from East Asia and Latin America.

II. Lessons from the Mexico and East Asia: The Emergence of a "Consensus View"

The Mexican meltdown was followed by abundant post-mortems and a few mea-culpas. The IMF and the World Bank tried to explain their involvement in the episode, the financial sector convened wise-men commissions, and the U.S. Senate investigated the U.S. Treasury's role in the unleashing of the crisis. Grandiose phrases were uttered, and everyone agreed that a greater degree of vigilance was needed to avoid major crises in the future. In retrospect it may be tempting to argue that most of this was lip service, and that international bureaucrats and Wall Street professionals went on with their business, leaving the Mexican crisis behind as a bitter experience that had affected that year's bonuses and had somewhat bruised their

reputations, but that would not be repeated in the foreseeable future. They were wrong. Merely thirty months later the East Asian “tigers” began to crumble in a way that, in more than one respect, resembled the Mexican saga.

In spite of some differences of opinion, by late-1996 and early-1997 somewhat of a consensus on the main policy lessons from the Mexican crisis had emerged. Although not every author subscribed to every one of them, I would argue that the following list constitutes what can be called the generally accepted consensus view from Mexico:²

- Pegged (or very rigid) exchange rates are dangerous; real exchange rate overvaluation may be lethal.
- Very large current account deficits matter, even when they are financed with private funds, and when public finances are under control.
- Portfolio capital flows can be highly volatile. In particular, short term capital flows may be highly destabilizing. Issuing foreign-currency denominated debt to defend the currency may prove to be extremely costly in the eventuality that the exchange rate peg has to be abandoned. Moreover, central banks should avoid sterilizing international reserve losses in the context of rigid exchange rates.
- Banks should be supervised closely; weak banks invite contagion. The existence of weak banks will reduce the authorities’ ability to use interest rates as a macroeconomic tool, and is likely to amplify a currency crisis.
- Transparency in financial operations is important to build confidence among investors. Timely and accurate information is of essence.

Naturally, these lessons are related among themselves and should not be viewed in isolation; nor should they be considered as a rigid list of “necessary” or “sufficient” conditions for a crisis to erupt. The way to think about them is as a set of factors that, according to a large number of analysts, played a critical role in the unleashing of the Mexican events and that, thus, should be watched closely in other emerging countries. As mentioned, and as it will become clear in the discussion presented below, not every analyst placed the same emphasis on everyone of these factors, and some observers even disagreed with some of the lessons listed above.

In the rest of this section I elaborate briefly on each of these five Mexican lessons, and I discuss whether they were applicable to the case of the East Asian nations. I also discuss the way in which this *consensus view* has evolved in light of the East Asian, and subsequent crises of the 1990s (Russia and Brazil). In sections III and IV of the paper I focus in greater detail on two lessons that, in my opinion, can be potentially misleading – the role of large current account deficits, and capital inflows-induced destabilization.

II.1 On the dangers of rigid exchange rates and real exchange rate overvaluation .

The Mexican crisis brought to the core of the policy debate the merits of rigid nominal exchange rates, both in the short and long runs. In the late 1980s and early 1990s, and after a period of relative disfavor, rigid exchange rates made a comeback in academic and policy circles. A number of authors argued that fixed, or predetermined, nominal exchange rates provided an effective device for guiding a disinflation program and maintaining macroeconomic stability.³ According to this view, a prerequisite for a successful exchange rate-based stabilization program, is that the country in question has its public finances in order. Mexico had done this as early as 1988, the year that exchange rate-based stabilization program known as the *Pacto de Solidaridad* was implemented in full force.⁴

A recurrent problem with exchange rate-based stabilization programs – and one that affected the countries of the South American cone during the early 1980s -- is that inflation tends to have a considerable degree of inertia. That is, domestic prices and wages will continue to increase even after the nominal exchange rate has been fixed. This, in turn, will result in a decline in exports' competitiveness, as domestic costs will rise at a faster pace than proceeds from exports. Eventually, as was the case in Mexico between 1988 and 1994, this perverse dynamics will generate a serious degree of real exchange rate overvaluation, a slowdown in exports, and a very large current account deficit. Dornbusch (1997, p. 131) has made this point forcefully within the context of the Mexican crisis:

“Exchange rate-based stabilization goes through three phases: The first one is very useful...[E]xchange rate stabilization helps bring under way a stabilization...In the second phase increasing real appreciation becomes apparent, it is increasingly recognized, but it is inconvenient to do something...Finally, in the third phase, it is too late to do something. Real appreciation has come to a point where a major devaluation is necessary. But the politics will not allow that. Some more time is spent in denial, and then – sometime – enough bad news pile up to cause the crash.”

An additional complication is that under rigid exchange rates, negative external shock can result in a costly adjustment process. In principle, in a country with fixed exchange rates the authorities should react to a negative shock – a worsening of the terms of trade or a decline in capital inflows -- by tightening monetary and fiscal policies, until external balance is re-established. A direct consequence of this is that economic activity will decline significantly, and the rate of unemployment will tend to increase sharply. Whether in the real world this process is allowed to play its way, depends largely on political economy factors. In their analysis of the Mexican crisis, Sachs, Tornell and Velasco (1995 p. 71) argue that it is “hard to find cases where governments have let the [adjustment process under fixed exchange rate] run its course.” This, according to them, reduces the degree of credibility of pegged exchange rate regimes, and provides a good argument for adopting more flexible ones.

As may be seen in Table 1, in spite of Mexico's negative experience with a rigid exchange rate regime, all five of the East Asian nations had a rigid -- de facto, pegged or quasi pegged -- exchange rate system with respect to the US dollar. Whereas this system worked relatively well while the US dollar was relatively weak in international currency markets, things turned to the worse when, starting in mid 1996, the dollar began to strengthen relative to the Japanese yen. Naturally, as the dollar appreciated relative to the yen, so did those currencies pegged to it. This strengthening of the East Asian currencies squeezed competitiveness of exports, and fed back into larger current account imbalances.

The Mexican crisis reaffirmed the importance of avoiding overvalued exchange rates -- that is, real exchange rates that are incompatible with maintaining sustainable external accounts. In the spring 1994 meetings of the Brookings Institution Economics Panel, Rudi Dornbusch argued that the Mexican peso was overvalued by at least 30 percent, and that the authorities should rapidly find a way to solve the problem. In that same meeting, Stanley Fischer, soon to become the IMF's First Deputy Managing Director, expressed his concerns regarding the external sustainability of the Mexican experiment. Internal U.S. government communications released to the U.S. Senate Banking Committee during 1995 also reflect a mounting concern among some U.S. officials. Several staff members of the Federal Reserve Bank of New York, for example, argued that a devaluation of the peso could not be ruled out.⁵ In their analysis of the Mexican crisis and its sequel during 1995, Sachs, Tornell and Velasco (1996) emphasized the role of real exchange rate overvaluation; according to their computations, during the 1990-94 period the Mexican peso was overvalued, on average, by almost 29 percent (see their table 9). A thorough analysis by Ades and Kaune (1997), using a detailed empirical models that decomposed fundamentals' changes in permanent and temporary, indicates that by the fourth quarter of 1994 the Mexican peso was overvalued by 16 percent.⁶

After the Mexican debacle, academic and private sector analysts redoubled their efforts to understand real exchange rate behavior in emerging economies. Arguably, one of the most serious efforts was undertaken at Goldman-Sachs (G-S), where a dynamic model based on modern time series techniques was developed to evaluate the appropriateness of real exchange rates in 12 countries. The first version of this model, released in October of 1996, indicated that the real exchange rate was overvalued in Indonesia, the Philippines and Thailand. Subsequent releases of the model incorporated additional countries, and suggested that the Korean won and the Malaysian ringgit were also overvalued. In mid 1997, Goldman-Sachs introduced a new refined version of its model; according to these new estimates, in June of 1997 the currencies of Indonesia, Korea, Malaysia, the Philippines, and Thailand were overvalued, as were the currencies of Hong Kong and Singapore. In contrast, these calculations suggested that the Taiwanese dollar was undervalued by approximately 7 percent. Although according to G-S, in June 1997 the degree of overvaluation was rather modest in all five East Asian-crisis countries, it had been persistent for a number of

years: in Indonesia the real exchange rate had been overvalued since 1993, in Korea in 1988, in Malaysia in 1993, in the Philippines in 1992, and in Thailand since 1990.

According to Sachs, Tornell and Velasco (1996) by late 1994 the real exchange rate picture in the East Asian countries was mixed and looked as follows: While the Philippines and Korea were experiencing overvaluation, Malaysia and Indonesia had undervalued real exchange rates, and the Thai Baht appeared to be in equilibrium. In a recent study Chinn (1998) used a standard monetary model to estimate the appropriateness of nominal exchange rates in East Asia before the crisis. According to his results, in the first quarter of 1997 Indonesia, Malaysia and Thailand had overvalued exchange rates, while Korea and the Philippines were facing undervaluation.

Although in the aftermath of the Mexican crisis a broad consensus emerged on the perils of real exchange rate overvaluation, there was less of an agreement on what type of *nominal* exchange rate policy emerging countries should follow. Some authors argued that after a short initial period with a rigid exchange rate, a crawling peg should be adopted. This position was taken by Dornbusch (1997, p 137), who argued “crawl now, or crash later,” and by Bruno (1995 p.282) who said, in general, that “[t]he choice of the exchange rate as the nominal anchor only relates to the initial phase of stabilization.” A similar position was taken by Sachs, Tornell and Velasco (1995) who argued that “[t]he effectiveness of exchange rate pegging is probably higher in the early stages of an anti-inflation programme...” Goldstein (1998 p. 51), maintained that “all things considered, moving toward greater flexibility of exchange rate at an early stage (before the overvaluation becomes too large) will be the preferred course of action...”

Others, however, have pointed out that most emerging markets are in a position to adopt a floating exchange rate.⁷ For example, in a May 1995 World Bank paper on “Managing Capital Flows in East Asia,” Wang and Shilling (1995, p. 54) went as far as saying that one of Mexico’s main lessons was that “[e]xchange rates should be flexible and combined with an appropriate monetary and fiscal policy so that the current account deficit does not grow to unsustainable levels.” Another group – rather small in the months that followed the Mexican crisis, but growing rapidly since the East Asian debacle --, maintained that the Argentine experience since 1991 suggests that, within the context of a currency board, overvaluation may be corrected through improvements in productivity (Bartley 1997).

After the East Asian, Russian and Brazilian crises, economists’ views on nominal exchange rate regimes began to evolve quite rapidly. Fixed-but-adjustable regimes have been losing adepts, while the two extreme positions — complete fixity through a currency board or dollarization, and floating rates are gaining popularity. From a policy stand point, one of the more difficult issues is designing an “exit strategy,” that would allow countries with a rigid exchange rate regime to make a transition towards a more flexible one (Eichengreen, Rose and Wyplosz 1996).

II.2 Very large current account deficits matter

In 1990 the international financial markets rediscovered Mexico, and large amounts of capital began flowing into the country. As a result, Mexico could finance significant current account deficits -- in 1992-94 they averaged almost 7% of GDP. When some analysts pointed out that these deficits were very large, the Mexican authorities responded by arguing that, with the fiscal accounts under control, there was no reason to worry. The implicit notion was that current account deficits are a matter of concern only when they coexist with large fiscal imbalances. In 1993 the Bank of Mexico went as far as maintaining that:

“...the current account deficit has been determined exclusively by the private sector’s decisions...Because of the above and the solid position of public finances, the current account deficit should clearly not be a cause for undue concern. (p. 179-80)”

At the light of the Mexican crisis a large number of analysts maintained that this argument, sometimes referred to as Lawson’s doctrine, is seriously flawed. In an address to the Board of Governors of the Inter-American Development Bank, Larry Summers (1996), the US Undersecretary of the Treasury, said “current account deficits cannot be assumed to be benign because the private sector generated them.” This position has also been taken by the IMF. In evaluating the role of the Fund during the Mexican crisis, the Director of the Western Hemisphere Department and the Chief of the Mexico Division wrote: “large current account deficits, regardless of the factors underlying them are likely to be unsustainable (Loser and Williams, 1997, p 268). Secretary Summers went as far as saying that “close attention should be paid to any current account deficit in excess of 5% of GDP, particularly if it is financed in a way that could lead to rapid reversals.”

In the 1994 Brookings Panel session on Mexico, Stanley Fischer supported the view that large current account deficits are dangerous. He argued that:

“the Mexican current account deficit is huge, and it is being financed largely by portfolio investment. Those investments can turn around very quickly and leave Mexico with no choice but to devalue...And as the European and especially the Swedish experiences show, there may be no interest rate high enough to prevent an outflow and a forced devaluation” (1994, p. 306).

The issue, of course, is that current account deficits are financed by the sale of domestic securities to foreigners. This means that the current account position a country can maintain over the medium run will be determined by the pace at which foreigners want to accumulate that country’s financial liabilities (bonds, CDs, bank debt, stocks and so on). If foreigners lose confidence in the country, they will rapidly reallocate their portfolio, generating massive capital outflows forcing the country to go through an adjustment process.

Immediately following the Mexican crisis the view that under most circumstances -- and even if public finances are under control --, current account deficit can rarely exceed 4 to 5 percent of GDP gained considerable popularity among private sector analysts. This view is clearly captured by Milesi-Ferreti and Razin (1996):

“What persistent level of current account deficits should be considered sustainable? Conventional wisdom is that current account deficits above 5% of GDP flash a red light, in particular if the deficit is financed with short-term debt...”

And according to Ades and Kaune (1997) the threshold number level that usually triggers concern among analysts is 4% of GDP. A number of authors, however, argued that the fact that Mexico had had a large current account deficit in 1990-94 should not be generalized to most – or not even the majority – of developing countries. This view was taken, for example, by Sachs, Tornell and Velasco (1996) who found out that, contrary to popular accounts, high current account deficits did not explain the turmoil of 1995. A similar perspective was taken by Calvo and Mendoza (1996), and Frankel and Rose (1996).

In spite of these disagreements, the concern with large current account deficits was serious enough for a number of investment banks to attempt estimating a sustainable level of current account deficit for the major emerging economies. According to the Goldman-Sachs’ model, in late 1996 Malaysia and Thailand were running current accounts deficits that exceeded – but not by too much – their sustainable levels. In Indonesia, Korea and the Philippines the actual current account deficits were below what was estimated to be sustainable (see the discussion in section III for details).⁸

Whether “large” current account deficits were in fact a central cause behind the East Asian debacle continues to be a somewhat controversial issue. After analyzing the available evidence, in a recent comprehensive study Corsetti, Pesenti, and Roubini (1998) analyze the period leading to the East Asian crisis, and argue that there is some support for the position that large current account deficits were one of the principal factors behind the crisis. According to them, “*as a group, the countries that came under attack in 1997 appear to have been those with large current account deficits throughout the 1990s.* (emphasis in the original, p. 7).” And then, they add in a rather guarded way, “*prima facie* evidence suggests that current account problems may have played a role in the dynamics of the Asian meltdown (p. 8).” Radelet and Sachs (1998) have also argued that large current account deficits were an important factor behind the crisis. And, commenting on the eruption of the crisis in Thailand the Chase Manhattan Bank (1997) also argued that large current account deficits had been a basic cause behind the crises.

There are some problems with this view, however. Perhaps the most important one is that, as may be seen from Table 2, with the exceptions of Malaysia and Thailand the current account deficits were not

very large. Take for instance the 1990-96 period: for the five crisis countries the deficit exceeded the arbitrary 5% threshold in only 12 out of 35 possible times. The frequency of occurrence is even lower for the two years preceding the crisis: 3 out of 10 possible times. Some authors have attempted to analyze the magnitude of these deficits using formal solvency criteria. However, as I argue in section III of this paper, even when solvency- based models are used, simple ratio analyses are bound to generate misleading results.

II.3 Short term portfolio capital flows can be highly volatile

Perhaps one of the most difficult issues in designing a market-oriented reform program refers to the *sequencing* of policies. A key question in the sequencing debate has been whether the opening of the capital account should take place early on in the process, or if some form of impediments to capital mobility should be retained until the liberalization of trade has been consolidated and the domestic banking sector is strong enough (Edwards 1984). Mexico lifted capital controls in late 1989, rather early in its reform process, and before the banking sector had been privatized. Between 1990 and December 1993 massive volumes of short term capital moved into the country; foreigners' investments in the Mexican stock market increased from less than US\$5 billion to more than US\$54 billion; during that same period, foreigners holdings of Mexican government securities increased by almost US\$50 billion.

After the assassination of PRI presidential candidate Luis Donaldo Colosio in March, 1994, there was a significant slowdown in capital inflows into Mexico. The authorities' faced this situation by following a three-part strategy. The exchange rate was allowed to climb to the top of the band, interest rates on short term peso denominated securities were allowed to increase somewhat, and an increasingly larger volume of dollar-linked securities – the infamous Tesobonos – were issued. Throughout the year the Bank of Mexico sterilized the losses of international reserves in an almost one-to-one fashion.⁹ The increase in interest rates was timid, as the authorities feared that that policy could generate two non-desirable effects: first, it would slow down the recovery in an election year, and second, and more important, a significant hike in interest rates would have impacted negatively on an already weakened domestic banking sector (Edwards 1998a). As the year progressed, the issuing of Tesobonos became the principal element of Mexico's strategy. By the second half of the year, many wary foreign investors began to withdraw their funds from Mexico. Towards the end of the year, sensing a growing disequilibrium, domestic residents moved large volumes of funds out of the country. On December 19, with the level of international reserves dangerously low Mexico broadened the band. A few days later it became apparent that the new band was not sustainable, and the peso was floated.

After the devaluation the large volume of Tesobonos came back to haunt Mexico, and magnified the effects of the devaluation. As the value of the peso plunged, it became increasingly difficult for Mexico to

pay its foreign obligations. During the first eight months of 1995 more than US\$15 billion of Tesobonos were maturing, and without access to new monies Mexico moved dangerously close to defaulting on its official debts. It was only after the U.S. Treasury and IMF massive assistance packages that an orderly workout could be achieved.

Between 1995 and 1997 almost every post-mortem on Mexico emphasized the role of volatile capital flows in the unleashing of the crisis. Birdsall, Gavin and Hausman (1997), for example, have argued that “the Mexican crisis illustrates the dangers of short term debt.” A similar position was taken by Sachs, Tornell and Velasco (1996), and by Calvo and Mendoza (1996). Although the analytical stories behind these papers are somewhat different – some emphasize a self fulfilling panic, while others concentrate on herd behavior – the bottom line in all of them is unmistakable: if there is a change in investors’ sentiments, capital flows can be reversed suddenly, generating major dislocations and, even, a major crisis.

The initial reaction to the belief that capital flows were at the center of the crisis was somewhat guarded. Gavin, Hausmann, and Leiderman (1996) argued that, under some circumstances, it would make sense to implement policies aimed at slowing down capital inflows. The cases of Chile and Colombia were mentioned as possible examples on how to manage large inflows of capital. Others argued that the way in which capital inflows were intermediated made a big difference and that banks, through which most flows were channeled into the domestic economy, should be regulated closely. Not surprisingly, this was the view taken by the U.S. Treasury.

Interestingly enough, the most influential analyses on the role of capital inflows had been written before the crisis. In a series of papers Calvo, Leiderman and Reinhart (1993, 1995). argued that very large capital inflows created three type of problems for policy makers. First, capital inflows induce a real exchange rate appreciation; second, it is possible that they are not intermediated efficiently, generating a misallocation of resources; and third, sudden reversals in the flows may lead to a crisis. After contemplating a series of policy measures the authors’ concluded that a pragmatic approach to managing capital inflows would possibly work best:

“[T]here are grounds to support a policy intervention mix based on the imposition of a tax on short term capital imports, on enhancing the flexibility of exchange rates, and on raising marginal reserve requirements on short term bank deposits.” (1995, p. 380)

While individual countries’ experiences differed, short term portfolio funds were substantial in most of East Asia during 1995-97. For example, and contrary to the cases of most emerging economies, Indonesia lifted capital controls very early on, allowing short term capital to move in and out of the country with little impediments. Thailand, on the other hand, established in 1993 a government-run

institution (the BIBF) to help attract foreign capital. Malaysia maintained some form of controls on short term (portfolio) movements until 1996, at which point they were somewhat eased.

Korea was, at least in paper, an exception among the East Asian countries. For a long time the Korean authorities were skeptical of lifting controls on short term capital, arguing that their inherent volatility would generate major dislocation. This reluctance towards allowing a higher degree of capital mobility was, in fact, a difficulty in Korea's negotiations to join the OECD. Interestingly enough, and in spite of the reluctance to open the stock market to foreign funds, Korea allowed its banks to borrow very heavily and at very short maturities, from international banks. By the end of 1996, for example, Korean banks had borrowed US\$67 billion from OECD banks, of which US\$50 billion is estimated to have had a maturity of less than one year. What made things even worse was that by 1996 most of these monies were being used to shore up Korean conglomerates whose extravagant investments had gone bad.¹⁰

According to the Bank of International Settlements, by the end of 1996 short term (less than a year) lending by industrialized countries' banks to the East Asian nations was reaching extremely high levels. In Korea, for example, short-term bank loans from the advanced nations exceeded two times the volume of (gross) international reserves. In Indonesia, short term foreign banks' loans exceeded gross international reserves by more than one third. In late 1997 total short term debt exceeded total reserves in Malaysia by more than 60 percent. These figures are not very different from those from Mexico in 1994. Taiwan, on the other hand, offers a sharp contrast; by early 1997, short term debt to foreign banks was less than 20 percent of international reserves.

It is difficult to find an evaluation of the East Asian crisis that does not ascribe a central role to large capital flows in the region's debacle. Most authors' have emphasized the fact that short term capital is particularly volatile, and that in a world with high capital mobility losses in confidence massive portfolio reallocation and large losses in reserves. (See Goldstein 1998, Chote 1998, Fischer 1998). An important lesson from these crises is that international reserve management is key in preventing currency crises. Traditionally, analysts have measured the adequacy of a country's international reserves by comparing them to the annual volume of imports. This measure is, of course, irrelevant in a world where capital can move freely. As Edwards (1989), Calvo and Mendoza (1996) and Sachs and Radelet (1998), among others, have argued, the appropriate way to measure reserves is in relation to the domestic stock of money (M1 or M2). See table 3 for the evolution of the M1 to reserves ratio in a number of East Asian countries.

Although large capital inflows were on almost everyone's list of causes of the Mexican crisis, by early 1997 there were no massive calls for imposing capital controls on inflows. Even though views differed, as in the case of other policies, the consensus seemed to recognize the importance of sequencing arguments: the capital account should be opened once some key objective of reforms – such as fiscal stabilization, trade

reform, and the implementation of modern supervision -- had been attained. The Asian crisis changed all of that, and in its wake the calls for controlling capital mobility have rapidly increased. These proposals have come from academics, journalists, international civil servants and financiers. Some, such as Krugman (1998b) have argued that countries that are affected by a crisis should contemplate imposing temporary controls on capital outflows. This policy would allow the country in question to lower interest rates and restructure its economy in an orderly fashion. A more popular proposition, however, relates to imposing controls on capital inflows as a way of preventing currency crises. A growing number of authors have claimed that the example of Chile -- where between 1991 and 1995 capital inflows were subject to a one-year reserve requirement --, shows that restrictions on capital inflows (ands especially short term flows) may reduce a country's degree of vulnerability (Massad, 1998, Ito 1999, Rodrik 1998). I discuss this issue in greater detail in section IV of this paper.

II.4 Banks and other financial institutions should be supervised closely

What made the Mexican crisis so severe was that it went beyond the exchange rate sphere, engulfing the banking system. In 1991 the Mexican government began to privatize the 19 banks that had been nationalized in 1982-83, during the debt crisis. The privatization process was completed in 1992, with every bank being sold at several times its book value. At the time this was hailed as a great success, even though it actually should have been a matter of concern. The new owners -- mostly large industrial and commercial conglomerates, but also (as we later learned) illegal cartels -- knew very little about banking and decided not to inject new capital into the recently acquired banks (Edwards 1998a).

During the early 1990s Mexico's newly privatized banks were eager to get into new lines of business, including housing loans, consumer credit and reversed mortgages. The abundance of foreign capital permitted a remarkable credit expansion during 1991-94, when bank loans increased in real terms at an annual rate in excess of 25%. The bad news was that at the same time the ratio of past due loans to total loans more than doubled, from 4 to 8.3% of bank's portfolio.

Mexico found out that it was not easy to effectively and rapidly create a solid bank regulatory framework. The lack of trained personnel -- including inspectors and accountants -- slowed down the process, as did the rivalry between different government institutions with overlapping responsibilities. When the peso crisis erupted in December 1994, the supervisory system was still seriously underdeveloped and Mexico's financial sector was in a very weak position. Moreover, the type of policies that could have help avert the exchange rate crisis -- the tightening of monetary and fiscal policy in 1994, for example-- conceivably would have made bank's financial health even weaker, by increasing the number of bankruptcies.

Birdsall, Gavin and Hausmann (1997 p. 289) argue that the main policy lesson from Mexico is that “policy-makers need to keep a vigilant eye on the banking system. In particular, they should ‘lean against the wind’ of lending booms, to ensure that bank lending does not grow too rapidly, and they should ensure that banks are robust enough to weather the shocks to which they will inevitably be exposed.” Similar points were made by Calvo, Leiderman and Reinhart (1995), and Hale (1997), among others. In 1996 U.S. Undersecretary of the Treasury, Larry Summers argued that to the extent that bank supervision was appropriate, there would be no need for emerging countries to restrict capital mobility:

“[C]ountries should be very cautious about imposing capital controls with the objective of discouraging capital inflows...It is appropriate for supervisory authorities to think about reserve requirements and new regulations, and to be prepared to respond aggressively to changes in the pattern of capital inflows, through improvements in regulation and supervision” (1995, p. 55)

As in Mexico, the banking sector in every East Asian country was weak and poorly supervised. In Indonesia, for example, a number of banks -- many of them owned by relatives and close associates of President Suharto -- had systematically financed questionable projects and, in a way that resembled Mexico’s experience merely three years earlier, had fueled a remarkable real estate bubble. The weakness of many of the East Asian banks was well known to international analysts. In May 1997, for example, Standard & Poor’s lowered the ratings of the government-controlled Thai Finance Corporation (IFCT), and in June of that year financial analysts estimated that in Thailand non-performing assets of the financial system were reaching 12 to 15 percent of loans (see Table 4).

It was also well known that many Korean banks were having trouble getting paid by their clients. As some of the medium size *chaebols* ran into financial difficulties, Korean banks rolled over their debts at the same time as they increased their short term borrowing from international banks. The extent of supervision of Korea’s banks was so weak that they were basically free to speculate in the international financial markets. In fact, throughout most of 1997 many of the Korean banks borrowed short term in Yen, in order to purchase Brazilian and other Latin American Brady bonds! As early as November 1996, Goldman Sachs expressed its concern over the health of Korea’s banks, giving them the next to worst rating in its vulnerability analysis. And according to Merrill Lynch, by late 1997 the Korean “banking system’s equity capital has been effectively wiped out.” (*Merrill Lynch, South Korea*, 23 December 1997).

In spite of these clear signs of weaknesses many analysts dismissed the possibility of a major collapse in Korea. This perception was based on two factors: First, given, the existence of implicit insurance and a long history of government intervention in the financial sector, it was believed that the banks would be bailed out by the government. Of course, what people missed was that already in 1996 short term external

debt of Korean banks was already twice the country's stock of international reserves. Second, there was the notion that because Korea had capital controls, the health of bank's was not as important as in other countries. As I argue in greater detail in section IV below, this has become a generalized and dangerous myth among some policy analysts.

Starting in the second half of 1997, and largely as a result of the mounting difficulties in other countries in the region, international banks became increasingly reluctant to roll over their Korean loans. As the local banks could not come up with the required foreign exchange to repay their debts, they had to turn to the Bank of Korea. In a move that proved to be a fatal mistake, the Bank of Korea used up most of its (already low) international reserves in an effort to shore up domestic banks and avoid a major crisis. As reserves dwindled, more foreign creditors pulled out of the country, unleashing a perverse vicious circle.

The East Asian crisis greatly strengthened the view that a weak banking sector can generate tremendous damage in an emerging economy in the process of liberalizing (Ito 1999, Radelet and Sachs 1998, Corsetti, Pesenti and Roubini 1998). Everyone agrees on this one: bank supervision is of the essence. How supervision should be implemented in countries with weak institutions is another matter. In fact, as Mexico's experience showed, even when the authorities understand the importance of supervision, it may take a long time to actually have a new system in place.¹¹ There have been some new and specific proposals aimed at protecting the health of banks in countries with a limited regulatory capacity. These range from the imposition of 100% reserves banking to having a majority presence of foreign-owned banks (Garber 1998). It is likely, however, that their implementation will be hampered by political economy factors.

II.5 Information and Transparency are of the Essence

A post mortem of the Mexican crisis sponsored by the Council of Foreign Relations and undertaken by an independent task force chaired by John Whitehead concluded that in the period leading to the crisis full financial information was not forthcoming to all investors. A round table organized by the Group of Thirty under the telling title "Mexico: Why Didn't Wall Street Sound the Alarm?" reached a similar conclusion.

The IMF agreed with this conclusion, and vowed to design a modern information gathering system that would help avoid unpleasant surprises in the future. In a 1995 paper on Mexican lessons co-authored by the Director of the IMF's Western Hemisphere Department and the chief of the Fund's Mexico division it was argued that it was essential to establish "stricter requirements concerning the regular and timely submission of key economic and financial data to the fund and of standards for the publication of the kinds of economic data needed to enable markets to work more efficiently." To this effect the IMF established the Special Data Dissemination Standards (SDDS) program whose purpose is to "enhance the availability of

timely and comprehensive statistics and therefore contribute to the pursuit of sound macroeconomic policies; the SDDS is also expected to contribute to the improved functioning of financial markets.”

In spite of these initiatives, the East Asian countries did little to truly improve the flow of information and data availability, or to enhance the degree of transparency of government actions. Independent country risk evaluators continued to make a point of the lack of transparency and heightened corruption in many East Asian nations. For example, when evaluating corruption, the *International Country Risk Guide* systematically gave poor marks to Indonesia, the Philippines and Thailand and only marginally better marks to Korea and Malaysia.

Most East Asian analysts were aware that the quality of available data was poor and that the degree of transparency was deplorable. In fact, little was known on the true quality of banks' portfolios, or on the volume of loans granted to the dominating conglomerates. Moreover, there was virtually no reliable information on the banking system's -- and in the case of Thailand, on the central bank's -- off-balance sheet positions, including the astonishingly large sales of dollars in the futures market. Worse yet, as in the case of Mexico, the rating agencies largely failed to anticipate the increasing weaknesses of the East Asian economies. For instance, Standard & Poor's did not change its rating on Thailand until August 1, 1997; Indonesia, in turn, was not downgraded until December 31, 1997! How to actually improve the dissemination of information continues to be a difficult issue that would-be international architects will have to tackle in the months to come.

II.6 Some Complications and the Multiplicative Nature of the Vulnerability Factors

The history of financial collapses indicates that, in addition to the financial factors discussed above, many emerging economies face two serious complications. The first is the presence of fiscal imbalances. In this case the government will be forced either to print money, or to attract -- usually through very high domestic interest rates -- foreign funds in order to close the gap between government revenues and expenditures. As the recent Brazilian crisis has shown, both alternatives, however, are short term solutions and cannot be sustained in the longer run. At some point international reserves will either be depleted or the high interest rates policy will backfire by slowing down the economy, and igniting a series of bankruptcies. To the extent that the public believes that politically this stance is not sustainable, it will move its funds out of the country, helping generate additional distress and eventually a crisis.

Many analysts had thought that fiscal imbalances was a required element in a currency crisis. Not at all. Once again, a careful reading of financial history would have suggested that there have been numerous currency collapses in countries that have had control over public sector finances. The Chilean crisis of 1982

and the Mexican meltdown of 1994 are, perhaps, the better known ones, but certainly not the only ones (on Chile see Edwards and Edwards 1991; on other crises see Edwards and Santaella 1993).

The second complication is political. If the country faces political upheaval and social turmoil, international investors will become skittish and will withdraw from the market at the first signs of financial stress. This in turn -- and especially in the presence of the vulnerability factors discussed above -- is likely to unleash a series of events that could, sooner rather than later, end up in a major run against the currency. The foreign investors stampede following the assassinations of Mexican presidential candidate Luis Donaldo Colosio's and PRI's Secretary General Ruiz Massieu provided a clear underscoring to this principle. In at least two East Asian countries -- Indonesia and Korea -- there were significant political uncertainties during 1997. Although under "normal" circumstances these problems would not have ignited a crisis, they proved to be decisive in an environment where many of the financial variables discussed above were showing weaknesses.

The relationship between vulnerability factors is highly complex and subject to numerous feedback. Overvalued exchange rates, for example, slow down exports, encourage imports and generate larger current account deficits. As a result, domestic interest rates will have to rise in order to attract the foreign capital required to finance this deficit. Higher interest rates, in turn, will hurt local companies, and will increase the ratio of non performing bank loans. The banks, and sometimes the government, will react to this picture by rolling over questionable loans, hiding their true financial situation, and by issuing more dollar denominated debt. As additional foreign funds pour in, the extent of overvaluation becomes more severe, and the vicious circle is reinforced.

Many country-risk models used by financial analysts have tended to ignore the highly complex ways in which these factors interact. Instead, these models compile lists of vulnerability indicators, adding them up in a mechanical fashion. By neglecting the multiplicative nature of these factors, traditional approaches are bound, as in the case of East Asia, to miss many of the early distress signals. The problem is that, in spite of their sophisticated statistical models, financial analysts tend to ignore *history* -- and more specifically, *comparative history* -- when evaluating a country's prospects and vulnerabilities. By concentrating almost exclusively on the country's immediate past (24 to 36 months), standard statistical approaches -- including value at risk analysis -- neglect other country's experiences, including events that have led to major crises. Moreover, most existing models used to evaluate country risk take a "linear" or "additive" view of the world, and ignore the fact that "vulnerability factors" are multiplicative, feeding into each other and reinforcing themselves.

III. How Useful are Current Account Ratios as External Sector Indicators?

During the last three decades there has been a considerable evolution in economists' views regarding the current account. In an important article, titled "Does the Current Account Matter?", Corden (1994) makes a distinction between the "old" and "new" views on the current account. According to the former, "a country can run a current account deficit for a limited period. But no positive deficit is sustainable indefinitely." (Corden 1994, p. 88). The "new" view, on the other hand, makes a distinction between deficits that are the result of fiscal imbalances and those that respond to private sector decisions. According to the extreme version of this new view "an increase in the current account deficit that results from a shift in private sector behavior – a rise in investment or a fall in savings – should not be a matter of concern at all (p. 92)."

As mentioned in the preceding section, in the aftermath of the Mexican crisis many analysts argued that the "new" view was seriously flawed. While some, such as Bruno (1995), argued that large deficits stemming from higher investment were not particularly dangerous, others maintained that any deficit in excess of a certain threshold – say, 4% of GDP – was a cause for concern. Partially motivated by this debate, Milesi-Ferreti and Razin (1996) developed a framework to analyze current account sustainability. Their main point was that the "sustainable" level of the current account was that level consistent with solvency. This, in turn, means the level at which "the ratio of external debt to GDP is stabilized (Milesi-Ferreti and Razin 1998)."

The basic idea behind this type of sustainability analyses is captured by the following simple analysis. As mentioned, solvency requires that the ratio of the (net) international demand for the country's liabilities (both debt and non-debt liabilities) stabilizes at a level compatible with foreigners' net demand for these claims on future income flows. Under standard portfolio theory, the net international demand for country j liabilities can be written as:

$$\delta_j = \alpha_j (W - W_j) - (1 - \alpha_{jj}) W_j ; \quad (1)$$

where α_j is the percentage of world's wealth (W) that international investors are willing to hold in the form of country j 's assets; W_j is country j 's wealth (broadly defined), and α_{jj} is country's j asset allocation on its own assets. The asset allocation shares α_j and α_{jj} , depend, as in standard portfolio analyses, on expected returns and perceived risk. Assuming that country's j wealth is a multiple λ of its (potential or full employment) GDP, and that country's j wealth is a fraction β_j of world's wealth W , it is possible to write the (international) net demand for country's j assets as:¹²

$$\delta_j = \{ \alpha_j \theta_j - (1 - \alpha_{jj}) \} \lambda_{jj} Y_j; \quad (2)$$

where, Y_j is (potential) GDP, and $\theta_j = (1 - \beta_j) / \beta_j$.

Denoting, $[\{ \alpha_j \theta_j - (1 - \alpha_{jj}) \} \lambda_{jj}] = \gamma_j^*$, then,

$$\delta_j = \gamma_j^* Y_j. \quad (3)$$

Equation (3) simply states that, in long run equilibrium, the net international demand for country j assets, can be expressed as a proportion γ_j^* of the country's (potential or sustainable) GDP. The determinants of the factor of proportionality are given by (3) and, as expressed, include relative returns and perceived risk of country j , and other countries.¹³

In this framework, and under the simplifying assumption that international reserves don't change, the "sustainable" current account ratio is given by:¹⁴

$$(C/Y)_j = \{ g_j + \pi_j^* \} [\{ \alpha_j \theta_j - (1 - \alpha_{jj}) \} \lambda_{jj}], \quad (4)$$

where g_j is the country's sustainable rate of growth, and π_j^* is a valuation factor (approximately) equal to international inflation.¹⁵ Notice that if $\{ \alpha_j \theta_j - (1 - \alpha_{jj}) \} < 0$, domestic residents' demand for foreign liabilities exceed foreigners' demand for the country's liabilities. Under these circumstances the country will have to run a current account surplus in order to maintain a stable (net external) liabilities to GDP ratio. Notice that according to (4) there is no reason for the "sustainable" current account deficit to be the same across countries. In fact, that would only happen by sheer coincidence. The main message of (4) is that "sustainable" current account balances vary across countries and depend on whatever variables affect portfolio decisions, and economic growth. In other words, the notion that no country can run a sustainable deficit in excess of 4%, 5% of GDP, or any other arbitrary number is nonsense.

Using a very similar framework to the one developed above, Goldman-Sachs has made a serious effort to actually estimate long run sustainable current account deficits for a number of countries (Ades and Kaune 1997). Using a 25-country data set G-S estimated the ratio of external liabilities foreigners are willing to hold -- γ_j^* in the model sketched above --, as well as each country's potential rate of growth. Table 5 contains G-S's estimates of γ_j^* , while Table 6 presents their estimates of long run sustainable current account deficits. In addition to estimating these steady state imbalances, G-S calculated asymptotic convergence paths towards those long run current accounts. These are presented in table 6, under the heading "*short run sustainable balances.*" Several interesting features emerge from these tables. First, there is a wide variety of estimated long run "sustainable" deficits. Second, with the notable exception of China -- whose estimated "sustainable" deficit is an improbable 11% of GDP --, the estimated levels are very modest, and range from 1.9 to 4.5% of GDP. Third, although the range for the "short run sustainable level" is broader, still in very few countries it exceeds 4% of GDP. Fourth, the estimates of the ratio of each country

external liabilities foreigners are willing to hold -- γ^*_j in the model sketched above --, exhibit more variability. Its range (excluding China) goes from 31.5 to 64.6% of GDP.

Although this type of analysis represents an improvement with respect to arbitrary current account thresholds, it is subject to a number of serious limitations, including the fact that it is exceedingly difficult to obtain reliable estimates for the key variables. In particular, there is very little evidence on equilibrium portfolio shares. Also, the underlying models used for calculating the long term rate of growth tend to be very simplistic.

The most serious limitation of this framework, however, is that it does not take into account, in a satisfactory way, transitional issues arising from changes in portfolio allocations. These, however, can have a fundamental effect on the way in which the economy adjusts to changes in the external environment. For example, the speed at which a country absorbs surges in foreigners' demand for its liabilities will have an effect on the sustainable path of the current account (Bacchetta and van Wincoop 1998).

The key point is that even small changes in foreigners' net demand for the country's liabilities may generate complex equilibrium adjustment paths for the current account. These current account movements will be necessary for the new portfolio allocation to materialize, and will not generate a disequilibrium – or unsustainable – balance. However, when this equilibrium path of the current account is contrasted with threshold levels obtained from models such as the one sketched above, analysts could (incorrectly) conclude that the country is facing a serious disequilibrium.

In order to illustrate this point, assume that equation (5) captures the way in which the current account responds to change in portfolio allocations. In this equation γ^*_t is the new desired level (relative to GDP) of foreigners' (net) desired holdings of the country's liabilities; γ^*_{t-1} , on the other hand, is the old desired level.

$$(C/Y)_t = (g + \pi^*) \gamma^*_t + \beta (\gamma^*_t - \gamma^*_{t-1}) - \eta ((C/Y)_{t-1} - (g + \pi^*) \gamma^*_t), \quad (5)$$

where, as before, $\gamma^* = [\{\alpha_j \theta_j - (1 - \alpha_{jj})\} \lambda_{jj}]$. According to this equation short term deviations of the current account from its long run level can result from two forces. The first is a traditional stock adjustment term $(\gamma^*_t - \gamma^*_{t-1})$, that captures deviations between the demanded and the actual stock of assets. If $(\gamma^*_t > \gamma^*_{t-1})$, then the current account deficit will exceed its long run value. β is the speed of adjustment, which will depend on a number of factors, including the degree of capital mobility in the country in question, and the maturity of its foreign debt. The second force, which is captured by $-\eta ((C/Y)_{t-1} - (g + \pi^*) \gamma^*_t)$, in equation (5) is a self-correcting term. This term plays the role of making sure that in this economy there is, at least, some form of “consumption smoothing”. The importance of this self correcting term will depend on the value of η . If $\eta = 0$, the self correcting term will play no role, and the dynamics of the current

account will be given by a more traditional stock adjustment equation. In the more general case, however, when both β and η are different from zero, the dynamics of the current account will be richer, and discrepancies between γ^*_t and γ^*_{t-1} will be resolved gradually through time.

As may be seen from (5), in the long run steady state, when $(\gamma^*_t = \gamma^*_{t-1})$, and $(CY)_{t-1} = (CY)$, the current account will be at its sustainable level, $(g + \pi^*) [\{\alpha_j \theta_j - (1 - \alpha_{jj})\} \lambda_{jj}]$. The dynamic behavior for the net stock of the country's assets in hands of foreigners, as a percentage of GDP, will be given by equation (6).

$$\gamma_t = (\gamma_{t-1} + (C/Y)_t) / (1 + g + \pi^*) \quad (6)$$

The implications of incorporating the adjustment process can be illustrated with a simple example based on the Goldman-Sachs computations presented above. Notice that according to the figures in Table 5, by the end of 1996 there was a significant gap between foreigners' desired holdings of Mexican and Argentine liabilities: while the Mexican ratio stood at 38.3% of the country's GDP, the corresponding figure for Argentina was 48.4%. Assume that for some reason – a reduction in perceived Mexican country risk, for example – this gap is closed to one half of its initial level, and that the demand for Mexican liabilities increases to 43% of Mexican GDP.

Figure 4 presents the estimated evolution of the sustainable current account path under the assumptions that Mexican growth remains at 5% and that world inflation is zero – both assumptions made by G-S. In addition it is assumed that $\beta = 0.65$, $\eta = 0.45$, and that the increase in γ^* is spread over three years.

The results from this simple exercise are quite interesting: first, as may be seen, the initial level of the sustainable current account level is equal to 1.9% of GDP, exactly the level estimated by G-S (see Table 6). Second, the current account converges to 2.15% of GDP, as suggested by equation (5). Third, and more important for the analysis in this section, the dynamics of the current account is characterized by a sizable overshooting, with the “equilibrium path” deficit peaking at 3.5% of GDP. If, on the other hand, it is assumed that the increase in γ^* takes place in one period, the equilibrium deficit would peak at 5%, a figure twice as large as the new long term sustainable level.

What makes this exercise particularly interesting is that these rather large overshootings are the result of very small changes in portfolio preferences. This strongly suggests that in a world where desired portfolio shares are constantly changing, the concept of a sustainable equilibrium current account path is very difficult to estimate. Moreover, this simple exercise indicates that relying on current account ratios – even ratios calculated using current “sustainability” frameworks – can be highly misleading. These dynamic features of current account adjustment may explain why so many authors have failed to find a direct connection between current account deficits and currency crises.

The analysis presented above suggests two important dimensions of adjustment and crisis prevention. First, current account dynamics will affect real exchange rate behavior. More specifically, current account overshooting will be associated with a temporary real exchange rate appreciation. The actual magnitude of this appreciation will depend on a number of variables, including the income demand elasticity for nontradables and the labor intensity of the nontradable sector. In order for this dynamic adjustment to be smooth, the country should have the ability to implement the required real exchange rate depreciation in the second phase of the process. This is likely to be easier under a flexible exchange rate regime than under a rigid one. Second, if foreigners' (net) demand for the country's liabilities declines – as is likely to be the case if there is some degree of contagion, for example –, the required current account compression will also overshoot. In the immediate run the country will have to go through a very severe adjustment. This can be illustrated by the following simple example: assume that as a result of external events – a crisis in Brazil, say – the demand for Argentine liabilities declines from the level estimated by G-S --48.4% of GDP -- to a 40% of GDP. While the long run equilibrium current account, as calculated by G-S, would experience a very modest decline from 2.9% to 2.4% of GDP, in the short run the adjustment would be drastic. In fact, the simple model developed above suggests that after two years the deficit would have to be compressed to approximately 0.5 % of GDP.¹⁶

The fact that the simple analysis of current account ratios can be misleading does not mean that the current account is an irrelevant variable. Indeed, within the spirit of the framework presented above, it is possible that the current account deficit is not compatible, even after considering a plausible dynamic path, with a stable liabilities to GDP ratio. Moreover, if the economic structure of the country is overly rigid, the current account overshooting discussed above may generate serious dislocations that could, on their own, affect portfolio allocation unleashing a vicious circle.

IV. Do Controls on Capital Inflows Reduce Vulnerability?

In the aftermath of these crises a number of influential academics have argued that globalization has gone too far and that, in the words of MIT's Paul Krugman (1998b p. 74), “sooner or later we will have to turn the clock at least part of the way back: to limit capital flows for countries that are unsuitable for either currency unions or free floating.” Discussions on the new international financial architecture have focused on two type of controls on cross border capital movements: controls on (short term) capital inflows, similar to those implemented in Chile between 1991 and 1998; and, controls on capital outflows, of the type Malaysia imposed in mid 1998. While the former have remained massively unpopular among economists – a significant exception being Krugman (1998b) –, the latter have rapidly grown in popularity.

Some observers have argued that Chile's approach to capital movements has been effective in reducing a country's vulnerability to speculative spells, and in reducing the real exchange rate "deprotection" effect of large capital inflows. It has also been argued that these restrictions have allowed Chile's monetary authorities to maintain greater control over monetary policy in the face of large capital inflows (Massad 1998). Joseph Stiglitz, the World Bank's Chief economist has been quoted by the New York Times (Sunday February 1, 1998) as saying: "You want to look for policies that discourage hot money but facilitate the flow of long-term loans, and there is evidence that the Chilean approach or some version of it, does this." This view has recently been endorsed by Ito (1999). In this section I evaluate Chile's recent experience with capital controls on inflows. I argue that the evidence does not support the current enthusiasm for this policy, and that the relative absence of contagion effect on Chile is due to its sturdy banking regulation and not to its capital controls policy.¹⁷

Chile's most recent experience with restrictions on capital inflows began in 1991, and lasted until September, 1998. This policy took two basic forms: minimum stay requirements for direct foreign investment flows, and non remunerated reserve requirements on other forms of capital inflows. Initially, 20% of capital entering into the country had to be deposited at the central bank for one year; during this period this deposit earned no interest. The rate of the deposit was increased to 30% in May of 1992, it was then reduced to 10% in July of 1998, and totally eliminated in September of 1998.

In evaluating Chile's recent experience with capital restrictions I have focused on three issues: First, is there evidence that capital controls have affected the composition of capital flows? Second, is there evidence that the imposition of restrictions to capital mobility has affected the dynamic response of the real exchange rate to capital flows shocks? The importance of this question stems from the fact that the restrictions were deliberately imposed to reduce the real exchange rate deprotection associated with the surge in capital inflows (Valdes-Prieto and Soto 1996). In fact as documented extensively in Section II of this paper, this real exchange rate deprotection effect of capital inflows is considered a major force behind the East Asian crisis. I tackle this question by estimating a series of unrestricted VARs on quarterly data, and analyzing the real exchange rate impulse response functions. And third, is there evidence that the impositions of the unremunerated reserve requirements affected in a significant way the relationship between Chile's and international interest rates? More specifically, I inquire whether these restrictions affected the time series process of interest rate differentials (corrected by expected devaluation) in Chile. In general one would expect that impediments to free capital mobility would affect both the speed at which interest rate differentials decline as well as the level to which they converge. I address this third question through the analysis estimation of a series of univariate equations using a time-varying coefficients techniques.

IV.1 Chile's Controls and the Composition of Capital Inflows

In a recent study Valdes-Prieto and Soto (1996) have calculated the tax-equivalence of Chile's unremunerated reserve requirement on capital inflows, and have evaluated their effect on a number of variables including real exchange rates. These authors have concluded that these restrictions have not been (fully) evaded, and that for a 180 days loan their annual tax equivalence has fluctuated between 1.29 and 4.53 percent. The implicit tax equivalence of longer term funds has been, since mid 1992, proportional, with loans with longer maturities paying a lower implicit tax (see also Cowan and de Gregorio 1998). According to Valdes-Prieto and Soto (1996) these capital restrictions altered the composition of capital inflows: they discouraged short term capital inflows, but had no significant effects on the aggregate volume of capital entering the country.

In Table 7 I present data on the composition of capital flows into Chile between 1988 and 1997. As may be seen there has indeed been a marked change in the composition of capital inflows, with shorter (that is less than a year) flows declining steeply relative to longer term capital. The fact that this change in composition happened immediately after the time when the capital restrictions were imposed supports the view that the controls policy has indeed affected the composition of inflows. These data also show that, with the exception of a brief decline in 1993, the total volume of capital inflows into the country continued to increase. In the rest of this section I analyze the effect of (net) flows and capital controls on real exchange rates and on interest rate differentials.

IV.2 Capital Controls and Real Exchange Rates in Chile

One of the fundamental purposes – if not the main purpose -- of Chile's restrictions on capital inflows has been to reduce their volume and, in that way, their pressure on the real exchange rate. According to a recent paper co-authored by a former senior Ministry of Finance official, “growing concerns about inflation and the exchange rate pressure of capital inflows have led policy-makers to introduce specific capital controls (Cowan and De Gregorio 1998).” Valdes-Prieto and Soto (1996), on the other hand, have argued that the imposition of these restrictions in mid 1991 responded to the authorities attempt to balance two policy objectives: the reduction of inflation and maintaining a competitive real exchange rate. According to these authors by implementing these unremunerated reserve requirements the authorities hoped to reduce – or at least delay -- the real exchange rate appreciation effects of these flows, at the same time as being able to maintain a higher differential between domestic and international interest rates (corrected by expected devaluations). This higher differential, in turn, was expected to help achieve the anti-inflationary objective. In this subsection I evaluate the real exchange rate objective, while in the next I address the interest rate differential objective.

I used two approaches to evaluate the real exchange rate objective of Chile's capital controls policy. First, using quarterly data I estimated a series of VARs for two different subsamples – one with and one without capital controls – and evaluated the real exchange rate impulse response to capital inflows innovations. Under an effective policy one would expect that the real exchange rate response to a capital flow innovation would be less pronounced – especially in terms of its dynamics – in the period with controls. Second, I used the longer period VARs (1987-96) estimates to evaluate the impulse response to a shock to the tax equivalence of the unremunerated reserve requirement.¹⁸

Figure 5 contains the impulse response functions for the log of the real exchange rate for the complete period (1981-96), a subperiod with no restrictions on capital inflows (1981-91:2), and a subperiod when the capital restrictions have been into effect (1991:3-96). The same data definitions as in the preceding section were used. Figure 6, on the other hand, contains the real exchange rate response to an innovation to the (implicit) tax on capital inflows.¹⁹ Two important facts emerge from these figures. First, the effect of the capital innovation on the (log) of the real exchange rate are extremely similar across periods. As may be seen, the maximum appreciation is almost the same in the with-restrictions period and in the period where there were restrictions to capital inflows. However, the (log) of the real exchange rate returns to equilibrium somewhat faster in the with restrictions period. This result is confirmed by the impulse response function in Figure 6.²⁰ As may be seen an innovation to restrictions on inflows results in a slight real depreciation. The effect however is short lived, and disappears after four quarters. The ordering of the variables is, as usual, important. In determining the ordering, one could be tempted to argue that capital controls are exogenous. This, however, could be misleading since in Chile, as in other emerging markets, the extent and coverage of controls have been adjusted in response to changes in the magnitude of capital flows. For this reason, alternative orderings – including one were allowed to respond endogenously – were considered. Overall, the results under alternative orderings confirm the results from Figure 6. The variance decomposition of the forecast errors of the (log of the) real exchange rate, not presented here due to space considerations (results available on request), confirms that the restrictions on capital inflows have not been effective in affecting the real exchange rate behavior: the capital restrictions variable explains no more than 3 percent of the forecast error.

Although these results are subject to some limitations – the experience with capital restrictions is rather short, limiting the availability of data points – they do provide preliminary evidence suggesting that the impact of this policy on the real exchange rate has been very limited and short lived. These results confirm previous findings by Valdes-Prieto and Soto (1996), who using a very different technique and a shorter sample to estimate a real exchange rate equation for Chile concluded that “the unremunerated reserve

requirement does not affect in any way the long run level of the real exchange rate...[I]n addition...these reserve requirements have an insignificant effect on the real exchange rate in the short run (p. 99).”

IV.3 Controls on Inflows and the Independence of Monetary Policy

Since the mid 1980s Chile’s monetary authorities have used interest rate targeting as one of the main – if not the main – anti-inflationary tool (Fontaine 1996). More specifically, as a way to reduce inflation the central bank has systematically attempted to maintain relatively high interest rates. This policy, however, became increasingly difficult to sustain during the late 1980s and 1990s when, as a result of Chile’s improving stance in international financial markets, higher domestic rates started to attract increasingly large volumes of capital. A fundamental objective of the capital restrictions policy in effect since 1991, then, has been to allow the country to maintain a higher interest rate. According to Cowan and de Gregorio (1998), “capital controls allowed policy makers to rely on the domestic interest rate as the main instrument for reducing inflation...[T]he reserve requirement has permitted maintaining the domestic interest rate above the international interest rate, without imposing excessive pressure on the exchange rate (p.16)”. In this subsection I use monthly time series to investigate formally the way in which capital restrictions have, in fact, affected interest rate differentials, and thus the ability to perform independent monetary policy, in Chile.

In the absence of restrictions to capital mobility, and under the assumption of risk neutrality and in the absence of country risk, the uncovered interest arbitrage condition will hold, and deviations from it would be white noise and unpredictable. The speed at which these deviations from interest arbitrage are eliminated is an empirical question, but in a well functioning market it would be expected to happen very fast. The existence of restrictions to capital mobility and of country risk, however, alter this basic equation in a fundamental way. In this case there will be an equilibrium interest rate differential (δ):

$$\delta_t = r_t - r_t^* - E\Delta e_t = k + R + u_t \quad (7)$$

Where r_t is the domestic interest rate, r_t^* the international interest rate for a security of the same maturity, $E\Delta e_t$ is the expected rate of devaluation, k is the tax equivalence of the capital restriction, R is the country risk premium, and u_t is an i.i.d. random variable. As in the case of free capital mobility, if at any moment in time the actual interest rate differential exceeds $(k + R)$, there will be incentives to arbitrageurs to move funds in and/or out of the country. This process will continue until the equilibrium interest rate differential is re-established. The speed at which this process takes place will, in principle, depend on the degree of development of the domestic capital market, as well as on the degree of capital mobility existing in the country in question. Countries with stiffer restrictions will experience slow corrections of deviations from the equilibrium interest rate differential (Edwards and Khan 1985, Dooley 1995,1997). Additionally, as equation (7) shows, the degree of capital restrictions (that is, k) will also affect the value towards which the interest

rate differential will converge.

In a world with changing policies, k is not constant through time. In fact, as has been documented in the preceding sections, the value of k has changed markedly in most Latin American countries during the last few years. With other things given, it would be expected that the imposition (or tightening) of capital restrictions will have two effects on the behavior of the interest rate differential. First it will increase the value towards which this differential converges; second, it will reduce the speed at which this convergence takes place. This means, under stricter restrictions on capital mobility the monetary authority gains greater control over domestic interest rates in two ways: first, it can maintain a higher interest rate differential – that is, the steady state value of δ will be higher than what it would have been otherwise – and second, δ can deviate from its long run equilibrium for longer periods of time. In this subsection I construct and use quarterly and monthly data on interest rate differentials for Chile to investigate the way in which the imposition and tightening of capital restrictions affected their behavior.

A problem with equation (7) is that there are no long reliable series on expectations of devaluation. In order to address this problem I construct a series of expected devaluations as the one step ahead forecasts obtained from an ARMA process for the actual rate of devaluation. After identifying the possible processes, several plausible representations were estimated. Finally, those that provided the better forecasts – measured according to standard criteria – were used. In the case of quarterly data I used an ARMA(2,1), while for monthly data I used an AR(1) to construct the expected devaluation series.

As a first step, unrestricted VARs estimated on quarterly data were used to estimate impulse response functions of interest rate differentials to a one standard deviation innovation of themselves. Figure 7 presents these impulses for two sub-samples: 1986-91 when there were no capital restrictions, and 1991-96, when the restrictions were in place. As may be seen, in both periods the deviation of δ from its equilibrium tended to disappear quite rapidly. This adjustment process seemed to have been somewhat faster in the period with no capital restrictions. As may be seen from the figure, during this early period δ has essentially gone back to trend after 2 quarters; for the later period, the adjustment is cyclical, after 4 quarters there is still a slight differential. This result is, in some ways, what one would have expected: in a period of capital restrictions interest rate differentials are somewhat more sluggish than in periods with no controls. A potential problem with this interpretation, however, is that during part of the earlier period (1986-87) Chile was still facing a very severe foreign credit constraint, and had very limited access to international capital markets. Unfortunately, due to the brevity of the experiments we are analyzing, the issue of “restrictions” vs. “access” cannot be addressed in an adequate way using quarterly data. Monthly data, however, allow us to use additional information and explore the behavior of interest rate differentials further.

In order to investigate the dynamic behavior of interest rates further I estimate the following equation

using a Kalman filter time varying parameter technique:

$$\delta_t = \alpha_t + \beta_t \delta_{t-1} + u_t, \quad (8)$$

where α_t and β_t are time varying parameters assumed to follow a random walk (Hamilton 1994). To the extent that β lies inside the unit circle, δ will converge to $(\alpha / (1 - \beta))$. In the absence of controls and with a zero country risk premium, we would expect $(\alpha / (1 - \beta)) \cong 0$, with interest rate differentials converging to zero. Moreover, in this case, we would expect that β would be very low, with interest rate differentials disappearing very rapidly. With country risk and capital restrictions, however, α would be different from zero, β will be rather high, and interest rate differentials will converge to a positive value. This means, then, that if the restrictions have been effective in increasing the authorities' ability to undertake independent monetary policy, we would expect that α_t and/or β_t would be higher in the period with capital controls.

The results obtained are presented in figure 5. As may be seen the estimated coefficient for the intercept declines throughout the period, capturing the fact that Chile's country risk was declining. Moreover, the estimated value of the coefficient of lagged interest rate differentials indicates that it did not increase after the imposition of controls and, thus, that the speed at which interest rate differentials corrected themselves was not affected by this policy.

All in all, the results presented in this section suggest that the restrictions on capital inflows imposed in 1991 did not have a significant effect on interest rate behavior in Chile. They did not affect their level, nor did they affect their dynamic behavior. This means that, contrary to the authorities' goals, capital controls did not give them greater control over monetary policy. These findings are consistent with the results reported by Calvo and Mendoza (1998), who found out that the decline in Chile's inflation has been largely unrelated to the authorities' attempts at targeting interest rates. According to Calvo and Mendoza's (1998) VAR analysis the main forces behind Chile's disinflation have been the real appreciation of the peso and (indirectly) a benign external environment, including positive terms of trade.

V. Open Issues and some Concluding Remarks

One of the most important characteristics of the East Asian crisis is that a large number of corporations became, literally overnight, insolvent. In fact in almost every country there has been a substantial net wealth loss, which if not properly addressed can seriously undermine the working of the economy. Ideally the East Asian nations would implement a scheme that would allow simultaneously for:

- Corporate restructuring, and especially corporate recapitalization;
- Extinction of dollar denominated debts issued by Indonesian entities;
- Increased direct foreign investment.

In this section I discuss a debt-to-equity swap (DES) mechanism that, if properly managed, could indeed help achieve these three objectives. A scheme similar to the one proposed here was used very successfully in Chile during the 1980s.

Four entities usually participate in a successful DES operation:

- The original holder of the emerging country debt. This would usually (but not always) be a foreign bank; for illustrative purposes we will refer to it as *“the foreign bank”*.
- The original issuer of the debt, usually a corporation in the country in question, which we will call *“the debtor.”*
- A foreign company eager to invest in this particular emerging country, if it can find an attractive deal. We will call it the *“foreign investor”*.
- And a local firm (or project) that is an attractive investment target for the *“foreign investor”*. We call it *“the project”*.

A DES operation is characterized by the following steps:

1. The “foreign investor” buys from the “international bank” a note originally issued by the “debtor”. This transaction takes place in the secondary market and will almost always involve a discount. That is, the “foreign investor” pays less than 100 cents to the dollar for the Indonesian debt. If the discount is assumed to be d , then the foreign investor will only pay $(1-d)$ per nominal dollar of the debt. At this point, then, the “international bank” (or foreign supplier, for that matter) has unloaded an unwanted debt; this is now in the hands of the “foreign investor.”
2. The “foreign investor” goes to the debtor country and locates the “original debtor”, or issuer of the note. The investor, then, offers the “original debtor” a discount f , if the latter prepays the debt fully in local currency (say, rupiah). Once this is done the “foreign investor” has rupiahs in hand, and the “original debtor” has seen its balance sheet position improved, since it has only paid $(1-f)$ for each dollar retired.
3. At this point the “foreign investor” uses the rupiah proceeds from the sale of the debt to the “debtor” to make an investment in “the project.” This operation is considered to be DFI and, thus, is subject to all the legal provisions – in terms of taxation, remittance of profits and so on – governing direct foreign investment.

As a result of this DES operation the following has happened:

1. The “international bank” has unloaded an Indonesian debt it did not want to carry in its books;
2. The “original debtor” has prepaid in rupiah and at a discount (f) a debt originally denominated in dollars.
3. The “foreign investor” has been able to participate in an Indonesian investment “project.”

The main attraction of this operation is that it has taken place without the debtor country using any foreign exchange, and thus, without any pressure on the value of the rupiah.

The successful implementation of this type of scheme is likely to require some legal reform. What is clear, however, is that for it to work it would be necessary that in the debtor countries restrictions on foreign ownership should be lifted immediately.

Some comments on DES mechanisms based on Chile's experience are in order:

- The difference between the discount given by the “international bank” to the “foreign investor”, and the discount given by the “foreign investor” to the “original debtor” represents the pecuniary incentive to the new investor to participate in the scheme.
- From a financial point of view this “discount differential” plays a role similar to that of a subsidized exchange rate: it allows foreign investors to fund their investments in more favorable terms, i.e. with lower disbursements. However, this mechanism does not imply any fiscal cost: the “subsidy” is paid by the original creditors, when they decide to sell their loans at a discount.
- Interested foreign investors had to sign a contract with the Government stipulating that they had the right to access the foreign exchange market to remit profits and capital, only after stipulated grace periods expired. This restriction is needed to avoid a massive outflow of foreign exchange (or undue pressures over the exchange rate) by creditors interested in using debt to equity swaps as a means of speeding up amortizations of rescheduled debts.
- In Chile, care was taken to avoid the destabilizing effects over currency and financial markets of massive portfolio adjustments eventually triggered by the program. On the one hand resident investors were not allowed to buy foreign exchange to participate in the program, except under a strict quota set by the Central Bank. Rights to participate in portions of the quota were auctioned off twice a month. On the other hand an excessive appetite for the program by foreign investment, that could stress the local financial market (because debtors would crowd it in search for funding for the required prepayments), was regulated by the two markets discounts referred to above. In the case of Indonesia we suggest that the government establishes two quotas for participating in this program: one for local entities and one for foreigners. The size of these quotas should be adjusted periodically (every two weeks, say), in order to make sure that the foreign

A debt-to-equity swap program along the lines proposed here was extremely successful in Chile. Starting in 1985, it helped to cut medium and long term foreign debt by 25% in just four years. As a result, highly indebted companies and banks were able to regain solvency and access to capital markets. Foreign investment helped recapitalize companies and banks and brought back life to depressed asset markets. In time

direct investment, production and employment surged. Although the program was only one element of a broader strategy aimed at re-launching the Chilean free market model, there is ample consensus that it played a key role not only for its direct effects, but as a catalyst of a new area of creative solutions.

The East Asian countries are also facing a serious internal debt problem, as many local corporations owe very large amounts of money to local banks and/or suppliers. This type of situation usually imposes high costs to society, including:

- the ongoing recession becomes deeper through payroll cuts, and the closure of otherwise profitable companies;
- domestic banks suffer large losses, risking the credibility of the financial system, the value of financial savings and the working of the payments system;
- huge amounts of fiscal resources are used to rescue local banks and/or debtors.

In facing this internal debt situation it is helpful to distinguish between cases where the banking sector is not at risk and cases where banks insolvency is an issue.

Case A: Corporate sector becomes (partially) insolvent, with no risk to the banking sector

Consider the case of a local (e.g. Indonesian) corporation that is unable to service its debts. Assume further that the main creditor is another local corporation. A debt workout program will typically include some of the following options:

- the conversion of the debt into ordinary shares – either common or preferred stock --; this amounts to a “plain vanilla” debt to equity swap;
- the conversion of the debt into non-voting shares or subordinated debt;
- the reduction of the present value of the debt through its long term rescheduling at below market interest rates (for example, its conversion into zero coupon bonds); or
- some combination of the above.

In principle, these options are available to private sector debtors and creditors, so no government intervention is to be called for. However, the following issues should be taken into account to make sure an efficient working of a market-based solution:

- bankruptcy laws and procedures have to be improved, otherwise troubled debtors (such as Company A) may well find in their advantage to muddle through, dragging on a de facto default situation;
- for the same reason, financial information procedures should be improved, in order to avoid bankrupt companies from running up their debts;
- the tax implications of this type of debt workout should be analyzed carefully, as they are open to abuse.

Case B: Banking sector is endangered by general domestic corporate insolvency

Assume that many domestic corporations are deeply in debt with local banks. If corporate insolvency is generalized, banks' capital may very well be at risk. As it is well known, banks operate with high leverage and are, thus, exposed to substantial losses from debt conversions as those suggested here. Therefore, what was initially thought to be an internal debt problem, may in deed become a banking problem.

The basic guidelines for recapitalizing a banking system are the following:

- depositors and other creditors should be assure early on that they do not stand to loose at all. The only exception to this principle is when a clear, partial guarantee system has been in place long before the crises;
- as a result of voluntary decisions some class of creditors, specifically, large foreign ones, may be persuaded to assume short term losses and help in the recapitalization of banks, through debt to equity swaps as those discussed above;
- original shareholders should bear the bulk of the loss. If they are willing to put new money so as restore their bank's health, they should be encouraged to, provided they have not been involved in fraudulent or grossly incompetent behavior.
- if losses are too large to be absorbed by original shareholders, it may be advisable to intervene the bank, increase its capital base with public resources and resell it as soon as possible.

Of course, bank recapitalization programs tend to be very costly. From amacroeconomic point of view, they typically involve a stepwise increase in public debt. In fact, international evidence from Argentina, Chile, Mexico, Venezuela and other countries suggest fiscal costs to rang from 15% to 30% of annual GDP. I t is crucially important that these costs are absorbed in such a way as not destabilize money supply and macroeconomics stability.

A bank debt restructuring program may be an important vehicle for minimizing fiscal costs and for avoiding excessive discretionality.

The mechanisms discussed above are, of course, not free from costs and potential dangers. We strongly believe, though, that the continuation of the present trend of imploding financial crisis is even more dangerous. Crisis situations do often demand exceptional and risky solutions. Moreover, we feel that these mechanisms can be designed so as to minimize such risks. The following three costs/dangers need to be addressed:

- Inflationary pressures are to be avoided. Government intervention through exchange rate guarantees and debt to equity swaps may involve monetary creation and thus exacerbate inflation. Such would be the case if the exchange rate guarantee involved a significant subsidy with respect to market rates or if debt-to-equity swaps were to trigger unwelcome exchange rate or interest rate movements. The architecture of the programs has to be such that these risks are minimized. Moreover, to a certain extent monetary creation can be sterilized through the placement of Central Bank debt in the local market, as done in Chile, for example.
- Fiscal impact has to be limited. The sterilization of the monetary impact of the proposed programs may end up creating a fiscal problem. But one should not over react to this. To begin with, the problem already exists from the moment a large number of banks and companies become insolvent, and massive government help will be needed to face that situation. But in addition, after a long period of sound fiscal policies, Asian countries typically have relatively low public debt ratios and, thus, can afford a prudent accumulation of long term government or Central Bank debt. It is our view, anyway, that the mechanisms here proposed, if carefully implemented, do not pose undue fiscal risks.
- Moral hazard. Extreme care has to be applied not to create precedents and expectations that would induce market players to take excessive financial risks. In normal situations regulators have to make sure that risks are “fairly” priced: that is, that risk taking is not somehow subsidized. In the present critical circumstances, the problem is that excessive risk perceptions bring the opposite result: nobody is willing to undertake real and/or financial investments. This is the very reason why at this point some government intervention is desirable. But government intervention runs the risk of being perceived as a lifesaver that is permanently available, thus encouraging future imprudence. To minimize this danger, the programs here proposed have to: (a) be of a “closed nature”; that is, they should not be available to future debtors (the entry deadline drawn in stone, so to say, to avoid yielding to unavoidable lobbying for extensions and redefinitions of eligibility criteria). And (b), the programs should be build so as to include “prices” to be paid by their beneficiaries (for example, exchange rate guarantees applied to future possible devaluations, and not to previous ones; debt to equity swaps require creditors to accept a discount,

debtors to prepay and foreign investors to lock in their investments for relatively long periods). Of course, the art of good design is to find those prices that while preventing abuse, make the programs workable.

Finally, it is important to emphasize that in order for these schemes to operate effectively and as designed, it will be fundamental for the East Asian countries to implement legal and structural reforms. These should be aimed at:

- Improving the legal and regulatory environment. Transparency is of essence;
- Adopting GAAP accounting standards, that would allow investors to extract meaningful information from corporate balance sheets information.

The exact extent of these required reforms should be determined once the different schemes presented here move into the actual implementation phase.

Annex 1:
Mexico's FICORCA

In March 1983, six months into the debt crisis, the Mexican government created an institution to provide forward exchange coverage to Mexican debtors. This institution was known by its acronym FICORCA, and its first Chief Executive was Mexico's current President Ernesto Zedillo Ponce de Leon.

From all practical purposes, FICORCA was a success story:

- Almost 1,350 corporations took part in the program.
- Almost US\$ 12 bn of foreign debt were covered by FICORCA's different programs.

We believe that a scheme based on this experience could be helpful in East Asia.

FICORCA offered four basic programs that were distinguished by the debt covered and by the way in which the debtors financed their participation in the program. Table 1 summarizes the four programs. We believe that for the case of East Asia the more appealing program would be one that offers complete coverage – both principal and interests – and is financed by a government loan.

TABLE 1
Coverage of Exchange Rate Risk
Under Mexico's FICORCA Program

	Only Principal Payments Covered by Program	Principal and Accrued Interest Payments Covered by Program
Cash payment (in Mexican pesos)	<ul style="list-style-type: none"> • Program took place through authorized banks, which acted as intermediaries only. • Firm with dollar denominated debt bought dollars up front, at a subsidized exchange rate; subsidy ranged from 25% to 35%, depending on the terms of the restructured debt (6 to 8 years). • Foreign exchange for interest payments bought in free market • At the end of the grace period, the bank delivered to the creditor the US\$ required to make the principal payments 	<ul style="list-style-type: none"> • Program took place through authorized banks, which acted as intermediaries only. • Debtor firm used pesos to buy, up front, dollars at "official" exchange rate to cover principal and interest payments • Debtor firm earned interest (libor + 200 bps) on undisbursed balance • Bank made payments to creditor according to agreed upon schedule
Loan obtained, in pesos, by original debtor in order to make payment	<ul style="list-style-type: none"> • Debtor firm obtained credit in pesos from FICORCA, at "market" nominal interest rate • Firm used proceeds from loan to buy (from participating bank) dollars at a subsidized exchange rate; subsidy ranged from 25% to 35%, depending on the terms of the restructured debt. • At the end of the grace period, the bank delivered to the creditor the US\$ required to make the principal payments 	<ul style="list-style-type: none"> • Debtor firm obtained credit in pesos from FICORCA, at "market" nominal interest rate • Firm used proceeds from loan to buy (from bank) dollars at "official rate" • Debtor firm earned interest (libor + 200 bps) on undisbursed balance • Bank made payments to creditor according to agreed upon schedule

Annex 2
Debt-to-debt Swaps to Hedge Foreign Exchange risk:
An application of the Chilean Model

In this annex we describe the way in which a Chile-style foreign exchange cover would work in a country such as Indonesia.

Let Corporation A be a local (Indonesian) company with a foreign exchange-denominated loan with an International Bank (IB). The loan might originally have been a short term or medium term financial liability, but due to the crisis is subject to the rescheduling negotiated between the Government and creditor banks. Although this will benefit Corporation A by lengthening the maturity of its liability, it has the disadvantage of keeping it exposed to exchange risks. Corporation A, as many other foreign exchange debtor, no longer wants to hold such exposure. The following mechanism allows it to obtain longer maturities without additional exchange risk.

A. The Mechanism (see figure 1)

1. Corporation A and its bank, IB, sign a new debt contract rescheduling its foreign exchange debt under the terms negotiated by the Government (i.e., 8 years maturity, 3 years grace period).
2. The Central Bank (CB) (or other public agency, such as a Debt Restructuring Facility), sells to Corporation A an amount of foreign exchange equal to the principal of the rescheduled debt. The transaction is carried at the going market exchange rate.
3. Corporation A deposits with the CB the purchased foreign exchange. The deposit has exactly the same terms (maturity and interest rates) than the rescheduled debt. Partial or total withdrawals are only allowed under condition stated in 4.
4. As a counterpart, Corporation A gets a rupiah-denominated loan from CB. The maturity of this loan exactly matches that of the rescheduled debt. But it can be prepaid any time without cost. Prepayments allow Corporation A to withdraw the deposit described in 3. Such withdrawal can only be done in rupiah, at the going exchange rate.
5. Interest rates of the rupiah loan are set so as to match the *real* interest rate charged on the rescheduled debt (i.e., its nominal rate, typically stated as LIBOR plus a SPREAD, minus the inflation rate of the correspondent currency). Two alternative formulas may be offered:

- (a) The principal is indexed to local inflation and interest rates (R) are thus:

$$R = LB + SP - P^*$$

where LB stands for LIBOR of the currency of denomination of the loan, SP for the spread charged by banks on rescheduled debt and P* for the annual inflation (as measured by CPI or WPI) of such currency.

(this option was used in Chile and LIBOR and foreign currency inflation were US ones).

- (b) The principal of the loan is not indexed to local inflation, but then interest rates (I) are:

$$I = LB + SP - P^* + P,$$

where P is the annual rate of local inflation.

Interest payments are dated so as to match those of the rescheduled debt and the deposit.

6. Company A will then end up having doubled its liabilities, holding in its books the foreign exchange denominated rescheduled debt plus a local currency loan with the CB of equal initial size. The former, though, will be matched with a deposit of same amount, term, currency and rates with the CB. Since interest rates and exchange risks associated to this deposit get canceled out by those of the foreign exchange loan, Company A ends up facing no exchange risk and paying a net interest rate equivalent to that described in 5 above.
7. As a consequence of the simultaneous issuing of a foreign exchange deposit and the granting of a local currency loan, the CB assumes full exchange risks associated to any further depreciation. Note that conditions defined under 5 above, allow CB to be compensated by local inflation, so it will stand to lose only if the local currency were to depreciate over and above local inflation. If the opposite happens CB would benefit, as long as Company A does not exert its option to prepay the loan and withdraw the deposit, thus reverting to the initial foreign exchange exposure.

B. Results

Company A has been allowed to convert a short or medium term liability, denominated in foreign currency, and thus subjected to high perceived risk, into a source of long term funds denominated in local currency and at a reasonable cost. The real cost of funds to Company A would be equivalent to $LB + SP - P^*$. If LB is 6%, SP is 250 bps and P* (US inflation) is 2%, the real interest rate paid by Company A would amount to 6.5% over a local currency denominated loan. As a counterpart the Government, through the CB or other designed agency picks the full exchange risk associated to any future depreciation of the local currency over and above the local inflation rate. If the local currency were to appreciate in real terms, this would benefit the Government, as long as Company A does not exert its right to prepay and thus reverting to the initial situation.

Annex 2
Debt-to-equity Swap:
An application of the Chilean Model

In this annex we provide a detailed explanation of the proposed debt to equity swap mechanism.

Consider the case where a foreign investor (FI) is interested in investing in a troubled emerging economy, such as Indonesia, as long as asset prices are perceived to be a “bargain”. The following mechanism allows FI to be compensated for the excessive risk it perceives of investing into Indonesia, without generating an asset price destabilization or depression. A similar mechanism was successfully applied in Chile after the 1982 debt crisis, and is considered one of the key ingredients of Chile’s subsequent impressive recovery.

A. The Mechanism (see figure 2)

1. FI buys from a foreign bank a rescheduled Indonesian loan. If the original lender (i.e. the foreign bank) feels the conditions of the loan do not fully compensate its credit risk, it will be willing to sell the loan at a discount. In the case of banks the discount will typically be equal to loan provisions. If “d” is the discount, every dollar loan face values could be bought at (1-d) dollars.
2. FI approaches the issuer of that debt -- say, Corporation A -- and negotiates a prepayment of the debt. Prepayment is in rupiah, at the going market exchange rate. Corporation A will be willing to prepay this obligation only if it is offered an attractive discount; that is, if for every dollar of original debt it is allowed to pay, say, (1-f) dollars. (Notice that this assumes that the original debtor cannot, or is not allowed, to prepay in foreign exchange, because if so the whole debt-restructuring process would break down.
3. With the proceeds of the prepayment FI buys or increases the capital of Corporation B, its target investment. Notice that given the discounts involved in the two previous steps, the amount of funds available to be invested is equal to (1-f)/(1-d) for every dollar of original debt. Note that corporations A and B may be the same entity. In such case, the debt is converted into equity without prepayment and the discount is included in the price of the corresponding capital increase.
4. FI’s investment is given foreign investment treatment. This means that through a contract with the Government it is given the right to remit profits and capital, after a given grace period. In Chile, grace periods were 4 years for profits and 10 years for capital. These periods have to be made consistent with expected repayments of rescheduled debts so as to avoid a capital outflow. Remittance rights have to be completely secured, at the most favorable future exchange rate

available at the corresponding date, thus isolating them from any future rescheduling, payment suspension or capital controls.

5. If FI wanted to invest the equivalent of K dollars, through this mechanism it ends up having to disburse only M dollars, where:

$$M = K (1-d)/(1-f).$$

Therefore, if $d=30\%$ and $f=20\%$ (as seen in Chile), for every dollar of final investment, 0.875 ($=0.7/0.8$) dollars of disbursement are needed: an upfront 12.5% cut in capital costs.

6. As indicated in point 2, it is crucial to limit the access to the program to those investors with direct access to foreign exchange (like foreign investors). Notice that if local residents (including original debtors) could benefit from the discount “d”, they would massively demand foreign exchange and cause a steep depreciation of the currency. In essence this would mean the breakdown of the debt rescheduling process. In order to avoid this outcome Chile imposed exchange controls throughout the period under which this mechanism operated. However, local residents were allowed to operate in a similar, but limited, program; the Central Bank determined a maximum quota of restructuring available to local firms.

B. Results of the Scheme

Trough a debt-to-equity swap FI is able to fund investment projects at considerably lower capital costs. Conceptually this result is equivalent to the purchase of the corresponding assets at a discount (as would alternatively happen through asset price deflation or depreciation). The mechanism plays the role of a catalyst for FDI and foreign equity purchases, thus helping improve the business climate, while fostering investment and employment. Local firms benefit from a debt reduction, prepaying foreign debts at a discount. Some companies (not necessarily foreign exchange debtors) may be partially or totally sold to foreign investors attracted by the capital cost advantage and thus see their market value bid up. The source of these benefits is the discount at which rescheduled debts are sold (d), so the bill is in the end paid by those creditors that are willing to take a loss and exit, rather than stay and share the (uncertain and risky) harvest of the (eventual) recovery.

Figure 1

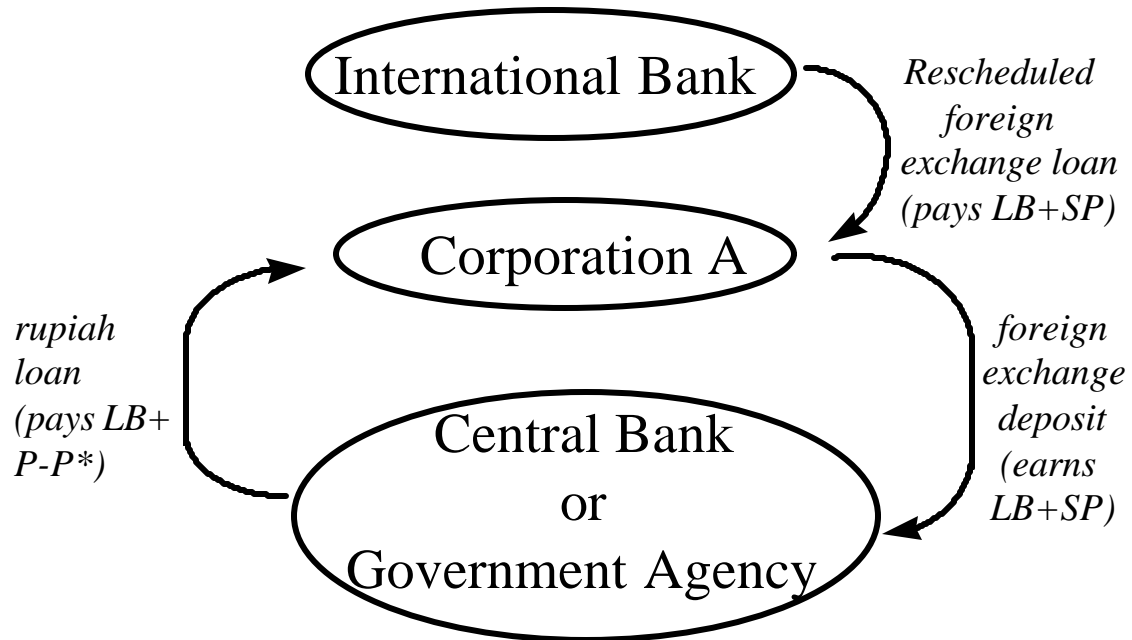
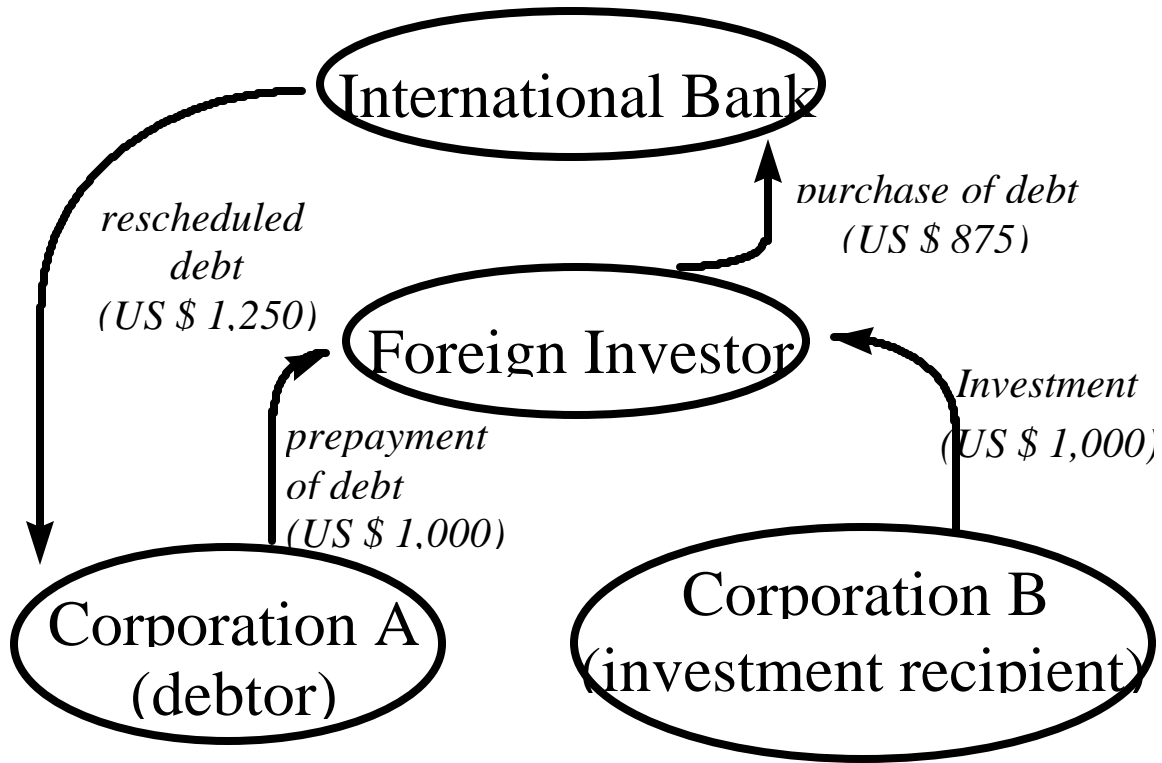


Figure 2

Memorandum:

Investment to be made (K):		US \$ 1,000
Discount accepted by lender (d):	30%	
Discount accepted by debtor(f):	20%	
Required disbursement (M) :		$M = 1,000(0.7/0.8) = 875$

Table 1: Vulnerability and Crises :Mexico and Asia

	Large Current Account?	Rigid Nominal Exchange Rates?	Overvalued Real Exchange Rates?	Weak Banks?	Large Portfolio Flows?
Mexico, 1994	Yes, exceeded 6.5% of GDP (1992-4)	Yes	Yes	Yes, non-performing loans high, weak supervision	Yes
Thailand, 1997	Yes, exceeded 8% of GDP (1995- 96)	Yes	Yes	Yes, finance houses very weak	Yes, BIBF channeled short term flows
Malaysia, 1997	Yes, exceeded 6.5% (1995-96)	Yes	Yes	Yes, weak supervision	Yes
Korea, 1997	Moderate, averaged 4% of GDP (1996 - 97)	No	No	Yes, bad portfolio very large ; concentrated on conglomerate sector	Yes
Indonesia, 1997	Moderate, averaged 3.5% of GDP (1995 - 96)	Yes, crawling band	Yes	Yes. They financed conglomerate questionable projects	Yes
Philippines, 1997	Yes, exceeded 4% of GDP (1995 - 96)	Yes	Yes	Yes	Yes

Table 2 : Current Account, BOP Definition (% of GDP)

	1990	1991	1992	1993	1994	1995	1996	1997
Korea	-0.69	-2.83	-1.28	0.30	-1.02	-1.86	-4.75	-1.85
Indonesia	-2.82	-3.65	-2.17	-1.33	-1.58	-3.18	-3.37	-2.24
Malaysia	-2.03	-8.69	-3.74	-4.66	-6.24	-8.43	-4.89	-4.85
Philippines	-6.08	-2.28	-1.89	-5.55	-4.60	-2.67	-4.77	-5.23
Singapore	8.33	11.29	11.38	7.57	16.12	16.81	15.65	15.37
Thailand	-8.50	-7.71	-5.66	-5.08	-5.60	-8.06	-8.10	-1.90
China	3.09	3.27	1.33	-1.94	1.26	0.23	0.87	3.24
Taiwan	4.74	4.39	1.69	1.6	1.66	1.61	3.45	2.35

Source: Corsetti et al. (1998).

Table 3: M1 to Foreign Reserve Ratio

	1990	1991	1992	1993	1994	1995	1996	1997
Korea	1.50	2.16	1.84	1.79	1.57	1.54	1.44	1.81
Indonesia	1.73	1.48	1.30	1.44	1.58	1.53	1.21	1.62
Malaysia	0.96	0.93	0.81	0.69	0.84	1.07	1.16	1.46
Philippines	1.14	1.21	1.05	1.13	1.01	1.19	0.89	1.24
Singapore	0.30	0.28	0.28	0.29	0.26	0.26	0.25	0.26
Thailand	0.57	0.50	0.48	0.48	0.47	0.43	0.44	0.52
Hong Kong	NA	0.45	0.46	0.45	0.40	0.35	0.35	0.23
Taiwan	0.99	0.98	1.18	1.27	1.28	1.32	1.42	1.55
China	4.95	3.87	10.30	12.99	4.74	4.07	3.45	3.24

Source: Corsetti et al. (1998).

Table 4: Non-Performing Loans as of 1996
(% of Total Lending)

Korea	8.0	Thailand	13.0
Indonesia	13.0	Hong Kong	3.0
Malaysia	10.0	China	14.0
Philippines	14.0	Taiwan	4.0
Singapore	4.0		

Source: BIS Annual Report.

Table 5: External world's desired holding of a country's liabilities (% of GDP)

<i>Country</i>	<i>Desired Holding</i>	<i>Country</i>	<i>Desired Holding</i>
Argentina	48.4	Brazil	38.3
Bulgaria	42.8	Chile	48.4
China	129.2	Colombia	38.3
Czech Republic	31.3	Ecuador	31.3
Hungary	31.3	India	47.2
Indonesia	53.9	Korea	55.4
Malaysia	53.9	Mexico	38.3
Morocco	31.9	Panama	38.3
Peru	48.4	Philippines	57.1
Poland	55.4	Romania	38.3
Russia	38.3	South Africa	38.3
Thailand	64.6	Turkey	38.3
Venezuela	38.3		

Source: Goldman Sachs.

Table 6: Sustainable Current Account Deficit (SCAD) (% of GDP)

	1997 CAD (Expected)	SCAD	Steady State SCAD
Argentina	2.7	3.9	2.9
Brazil	4.5	2.9	1.9
Bulgaria	-2.6	0.4	2.4
Chile	3.7	4.2	2.9
China	-1.4	12.9	11.1
Colombia	4.8	2.6	1.9
Czech Republic	8.6	2.1	1.3
Ecuador	2.0	-0.5	1.3
Hungary	4.0	0.8	1.3
India	1.8	3.8	2.8
Indonesia	3.0	4.0	3.4
Korea	3.8	4.9	3.6
Malaysia	4.1	4.9	3.4
Mexico	1.7	2.1	1.9
Morocco	1.8	0.3	1.3
Panama	6.1	0.8	1.9
Peru	5.1	3.3	2.9
Philippines	4.2	4.5	3.8
Poland	3.8	4.7	3.6
Romania	0.5	2.3	1.9
Russia	-2.8	2.5	1.9
South Africa	1.8	3.0	1.9
Thailand	5.4	6.0	4.5
Turkey	1.2	2.1	1.9
Venezuela	-4.6	2.2	1.9

Source: Goldman Sachs.

Table 7 : Capital Inflows (gross) to Chile

Year	Short term loans	Percentage of total	Long term loans	Percentage of total	Total	Deposits*
1988	916,564	96.3	34,838	3.7	951,402	--
1989	1,452,595	95.0	77,122	5.0	1,529,717	--
1990	1,683,149	90.3	181,419	9.7	1,864,568	--
1991	521,198	72.7	196,115	27.3	717,313	587
1992	225,197	28.9	554,072	71.1	779,269	11,424
1993	159,462	23.6	515,147	76.4	674,609	41,280
1994	161,575	16.5	819,699	83.5	981,274	87,039
1995	69,675	6.2	1,051,829	93.8	1,121,504	38,752
1996	67,254	3.2	2,042,456	96.8	2,109,710	172,320

* Deposits in the Banco Chile due to reserve requirements

Figure 1: The Asian Currency Crisis

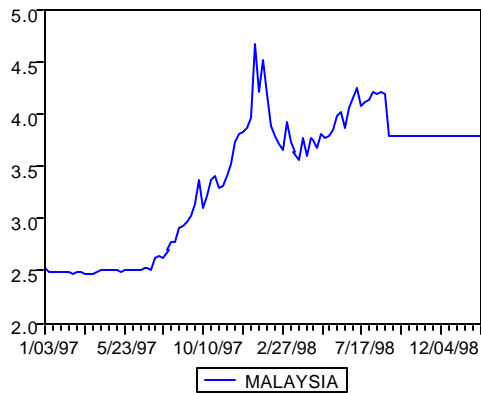
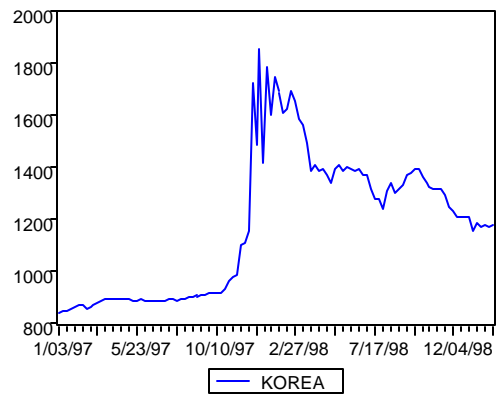
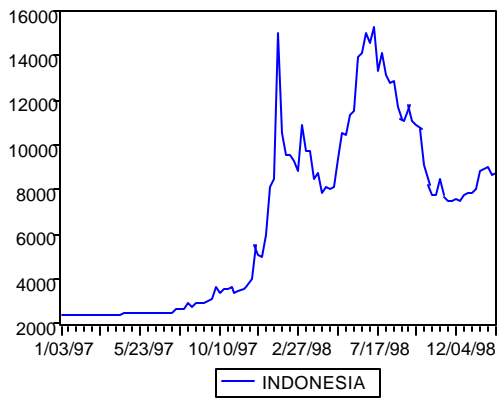
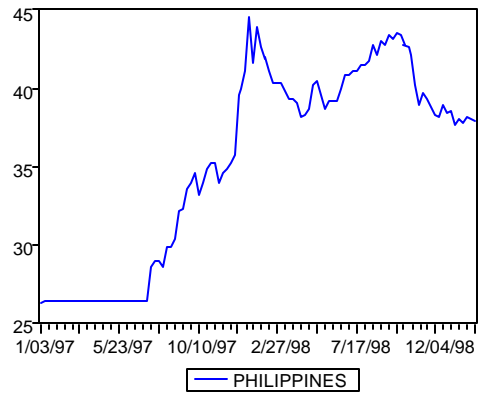
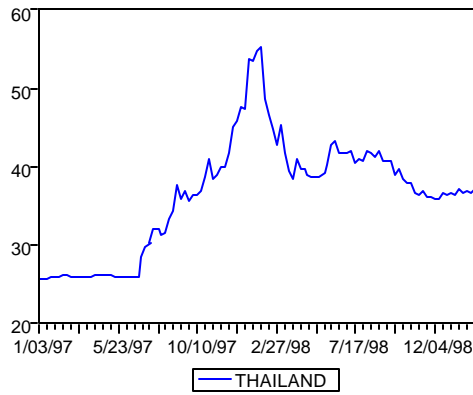


Figure 2: The Asian Crisis through the Interest Rate Lens

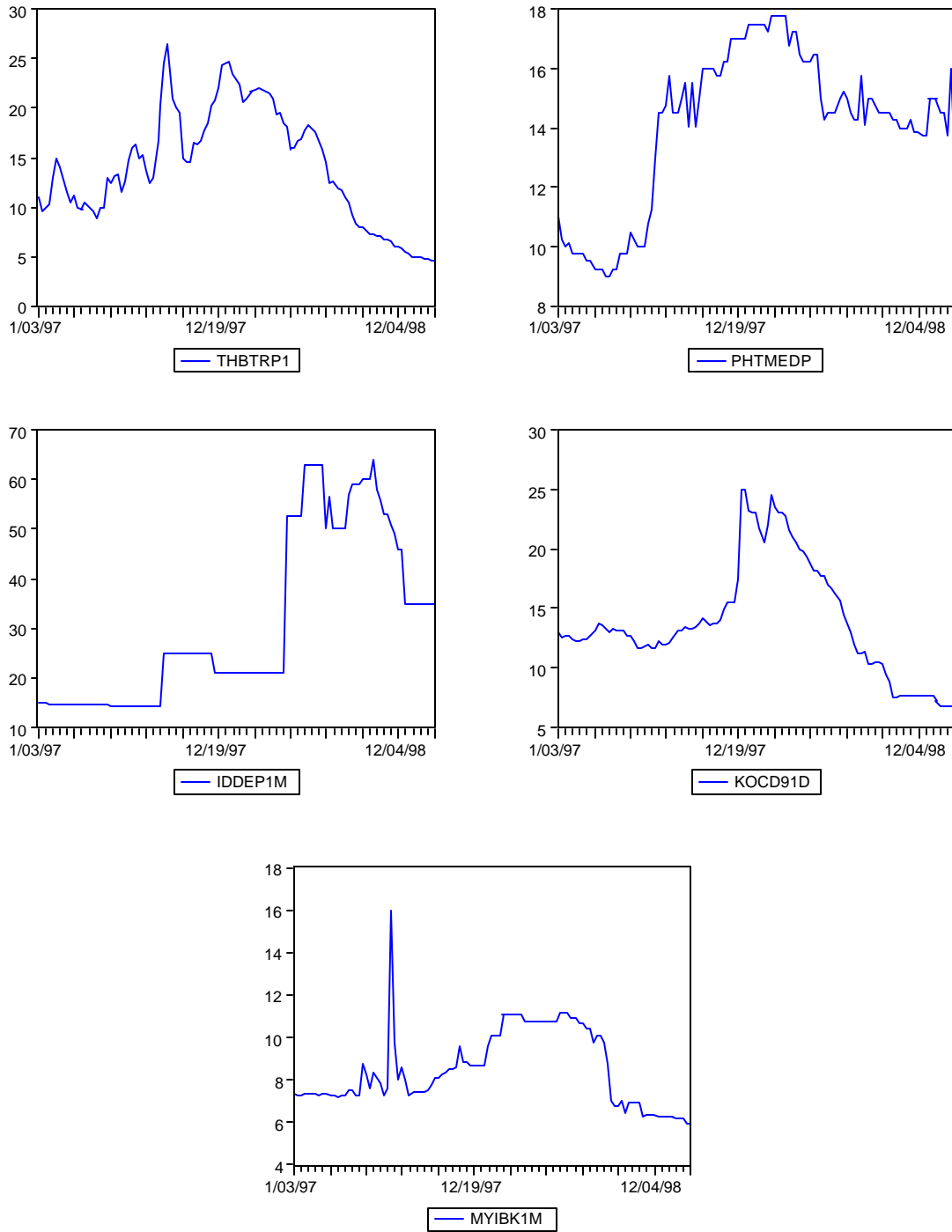


Figure 3: The Asian Crisis through the Stock Market Lens

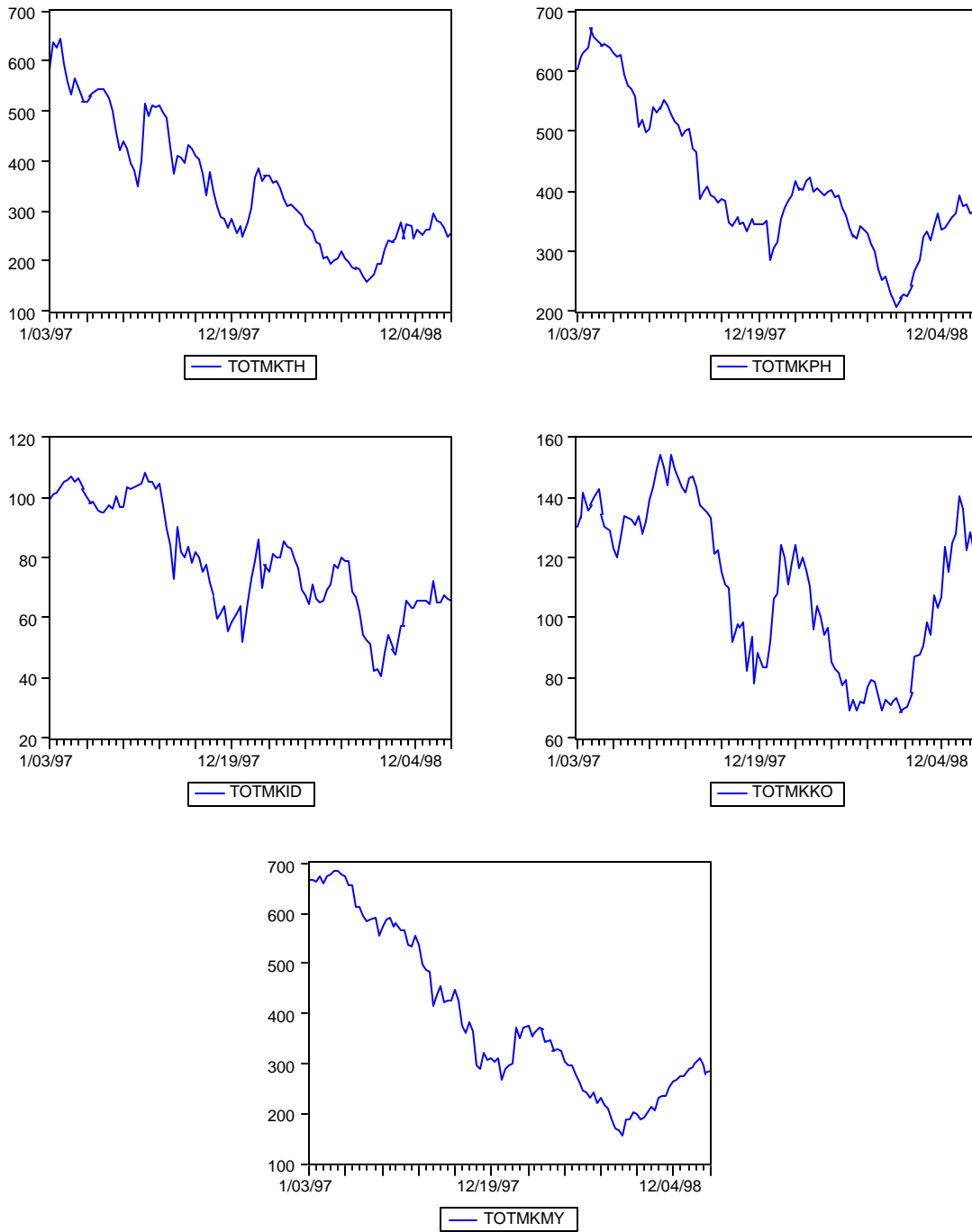
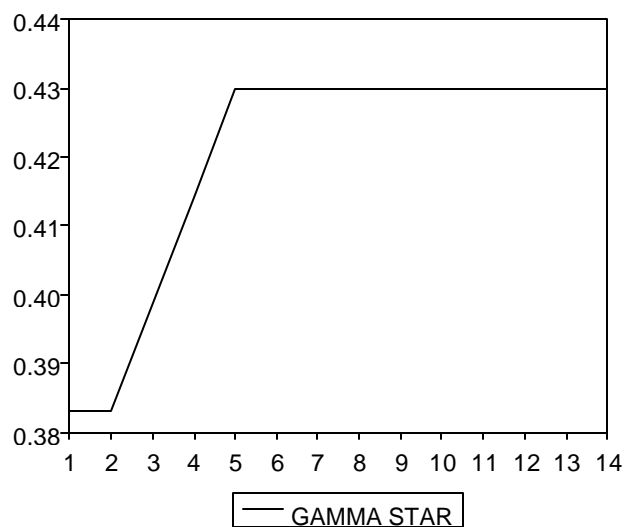
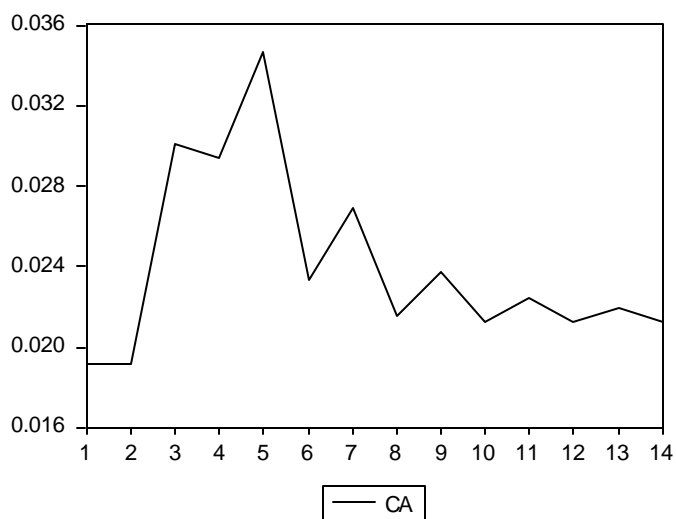


FIGURE 4: On the equilibrium Path of
The Current Account Deficit: A Simulation Exercise

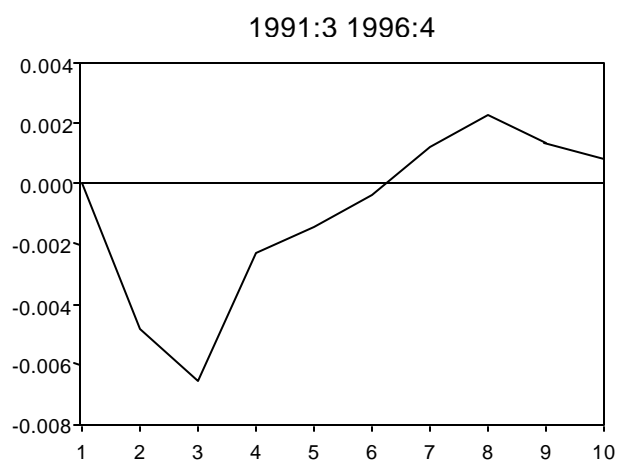
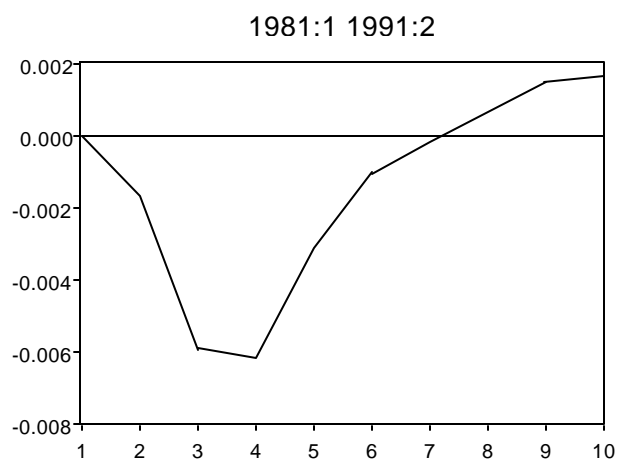
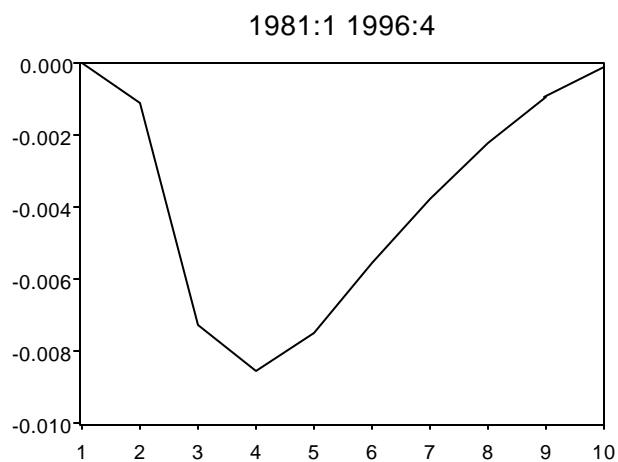


A. Assumed Evolution of Foreigners' Net Demand
for Mexico's Liabilities



B. Simulated Equilibrium Path of Mexico's
Current Account Deficit

**Figure 5: Response Of Log(RER) To
One S.D. Capital Flows Innovation In Chile**



**Figure 6: Response Of Log(RER) To
Controls +/- 2 S.E.
1988:1 1996:4**

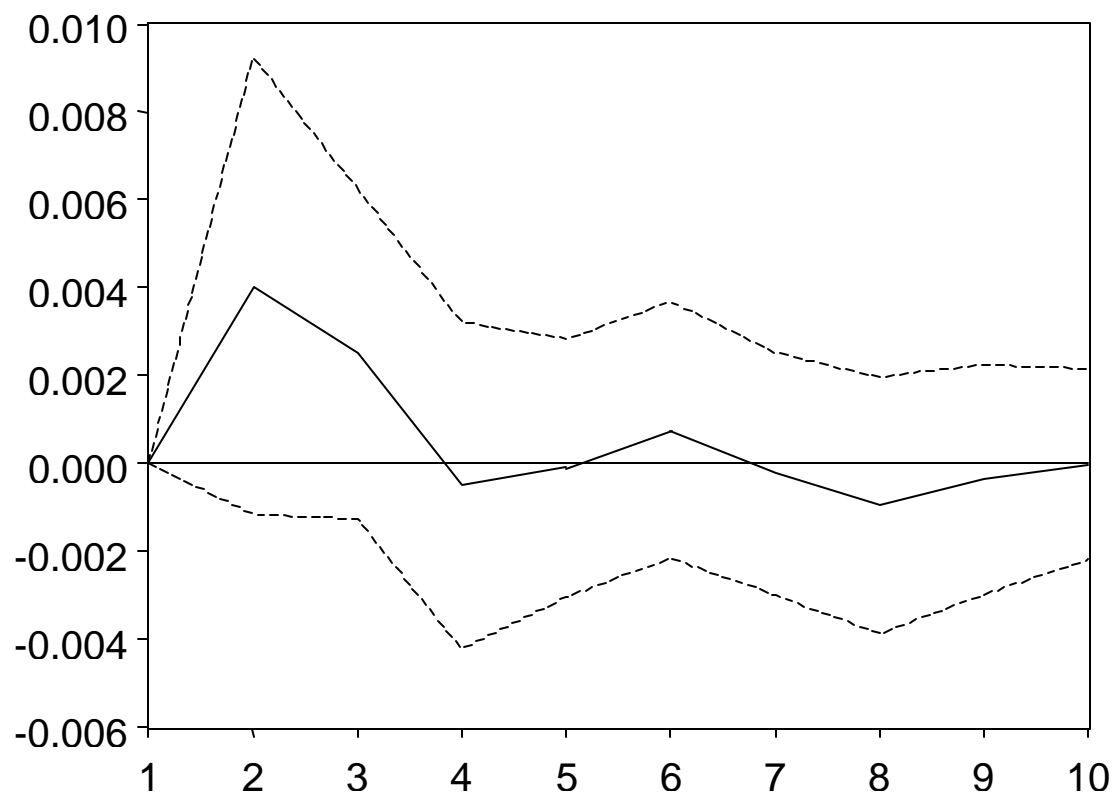
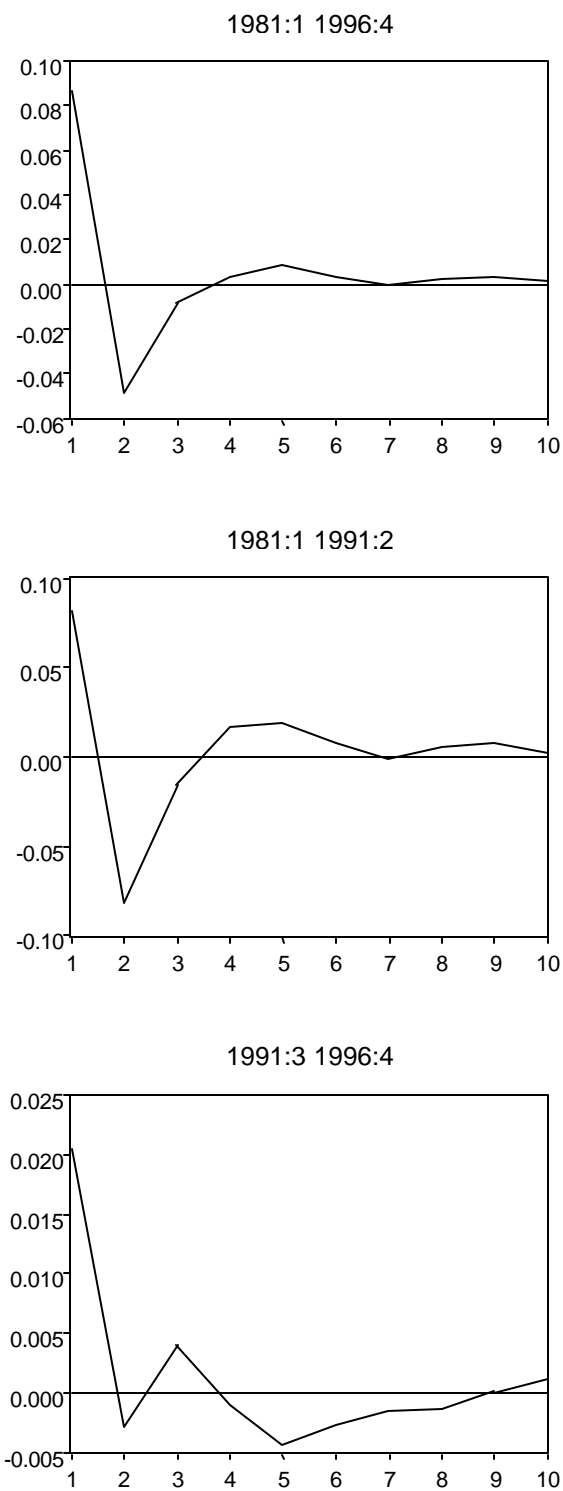


Figure 7: Response Of Interest Rate Differential To One S.D. Innovation in Interest Rate Differential In Chile



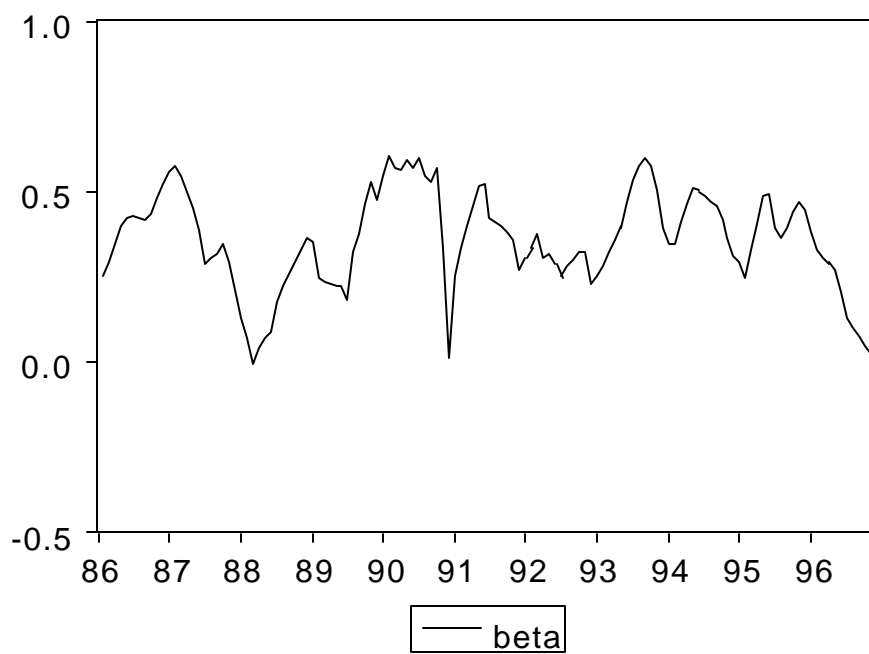
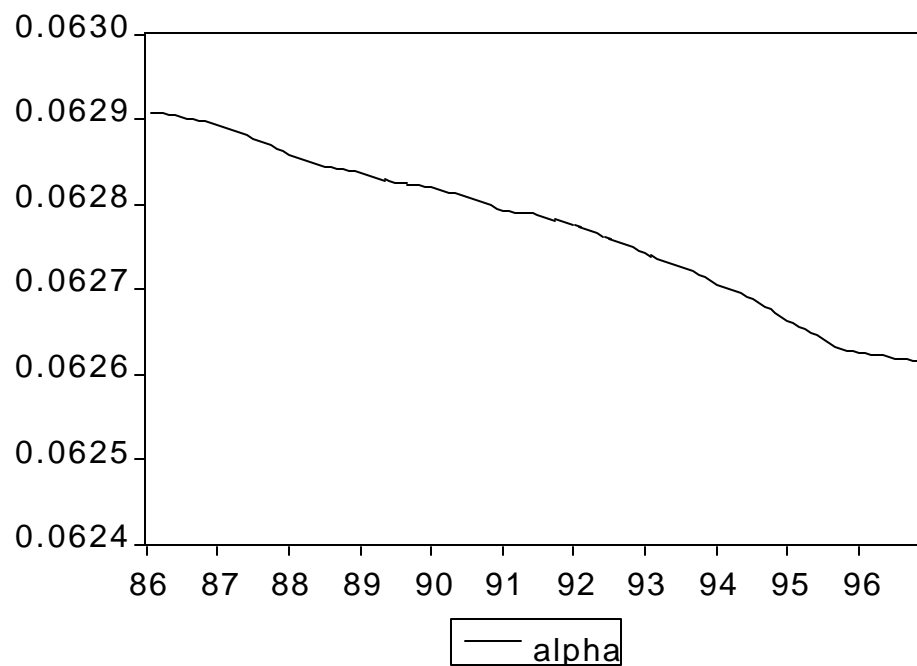


Figure 8: Time Varying Estimates of Interest Rate Differential Equation

References

- Ades, Alberto and Federico Kaune. 1997. "A New Measure of Current Account Sustainability for Developing Countries." Goldman-Sachs Emerging Markets Economic Research.
- Aspe, Pedro. 1993. *Economic Transformation, the Mexican Way*. Cambridge, MIT Press.
- Bacchetta, Philippe and Eric van Wincoop. 1998 "Capital Flows to Emerging Markets: Liberalization, Overshooting, and Volatility." National Bureau of Economic Research Working Paper No. 6530, April.
- Bartley, L. Robert. 1997. "Peso Folklorico: Dancing Away from Monetary Stability." In S. Edwards and M. Naim eds. *Mexico 1994*. Washington, DC: Carnegie Endowment.
- Banco de Mexico. *The Mexican Economy*. several issues, Mexico City.
- Birdsall, Nancy, Michael Gavin and Ricardo Hausman. 1997. "Getting the Lessons Right: A View from the Inter-American Development Bank." In S. Edwards and M. Naim eds. *Mexico 1994*. Washington, DC: Carnegie Endowment.
- Bruno, Michael. 1995. "Currency Crises and Collapses: Comment." *Brookings Papers on Economic Activity*, No 2.
- Burki, Shahid J. 1997. "A Fate Foretold: The World Bank and the Mexican Crisis." In S. Edwards and M. Naim eds. *Mexico 1994*. Washington, DC: Carnegie Endowment.
- Calvo, Guillermo A. 1998. "Varieties of Capital Market Crisis." In G. E. Calvo and M. King eds. *The Debt Burden and its Consequences for Monetary Policy*, London: Macmillan, forthcoming.
- Calvo, Guillermo A., Leonardo Leiderman, and Carmen Reinhart. 1993. "Capital Inflows and Real Exchange Rate Appreciation in Latin America: The Role of External Factors." IMF Staff Papers, 40, March.
- Calvo, Guillermo A., Leonardo Leiderman, and Carmen Reinhart. 1995. "Capital Inflows to Latin America with Reference to Asian Experience." In S. Edwards ed. *Capital Controls, Exchange Rates and Monetary Policy in the World Economy*, Cambridge: Cambridge University Press.
- Calvo, Guillermo A. and Enrique Mendoza. 1996. "Petty Crime and Cruel Punishment: Lessons from the Mexican Debacle." *American Economic Review*, May.
- Calvo, Guillermo and Enrique Mendoza. 1998. "Empirical Puzzles of Chilean Stabilization Policy." Mimeo, Duke University.
- Calvo, Guillermo and Carlos Vegh. 1998. "Inflation Stabilization and Balance of Payment Crises and Developing Countries." forthcoming J. Taylor and M. Woodford eds. *Handbook of Macroeconomics*, Amsterdam: North-Holland.

- Cardoso, Eliana, and Ilan Goldfajn. 1997. "Capital Flows to Brazil-The Endogeneity of Capital Controls." IMF Working Paper WP/97/115.
- Chang, Roberto and Andres Velasco. 1998. "Financial Crises in Emerging Markets: A Canonical Model." National Bureau of Economic Research Working Paper No. 6606, June.
- Chase Manhattan Bank, 1997. "Emerging markets After Thailand: Guilt by Association or Flattered by Comparison?" October 1.
- Chinn, Menzie. 1998. "Before the Fall: Were East Asian Currencies Overvalued?" National Bureau of Economic Research Working Paper No. 6491, March.
- Chote, Robert. 1998. *Financial Crises and Asia*, CEPR Conference Report, No.6. London: Centre for Economic Policy Research; Washington, D.C. 1998.
- Cline, William R. and Kevin J.S. Barnes. 1997. "Spreads and Risk in Emerging Markets Lending." Institute of International Finance Research Papers No 97-1
- Cole, Harold and Timothy Kehoe. 1996. "A Self-fulfilling Model of Mexico's 1994-1995 Debt Crisis." *Journal of International Economics*, 41, 309-330.
- Corden, W. Max. 1994. *Economic Policy, Exchange Rates, and the International System*. Oxford: Oxford University Press, and Chicago: The University of Chicago Press.
- Corsetti, Giancarlo, Paolo Pesenti, and Nouriel Roubini. 1998. "Paper Tigers? A Model of the Asian Crisis." paper presented at the NBER-Bank of Portugal International Seminar on Macroeconomics, Lisbon, 14-15 June.
- Cowan, Kevin and Jose de Gregorio. 1998. "Exchange Rate Policies and Capital Account Management." In R. Glick ed. *Managing Capital Flows and Exchange Rate Rates*, Cambridge: Cambridge University Press.
- D'Amato, Alfonse. 1995. "Report on the Mexican Economic Crisis." United States Senate, June 29, 1995.
- Dooley, Michael P. 1995. "A Survey of Academic Literature on Controls over International Capital Transactions." IMF Working Paper 95/127.
- Dooley, Michael P. 1997. "A Model of Crises in Emerging Markets." National Bureau of Economic Research Working Paper No. 6300.
- Dornbusch, Rudiger. 1997. "The Folly, the Crash, and Beyond: Economic Policies and the Crisis." in S. Edwards and N. Naim, Mexico 1994. Washington, DC: Carnegie Endowment.
- Dornbusch, Rudiger. 1998a. "Asian Crisis Themes." Mimeo, MIT, February
- Dornbusch, Rudiger. 1998b. "Capital Controls: an Idea whose Time is Past." in S. Fischer et al, "Should the IMF pursue Capital-Account Liberalization?." *Essays in International Finance* No.207, International Finance Section, Princeton University, May.

- Dornbusch, Rudiger, Ilan Goldfajn and Rodrigo O.Valdes. 1995. "Currency Crises and Collapses." *Brookings Papers on Economic Activity*. 1. 219-270.
- Dornbusch, Rudiger and Alejandro Werner. 1994. "Mexico: Stabilization, Reform, and No Growth." *Brooking Papers on Economic Activity*. 1. 253-297.
- Edwards, Sebastian. 1984. "The Order of Liberalization of the External Sector in Developing Countries." *Princeton Essays in International Finance* 156. Princeton University.
- Edwards, Sebastian. 1989. "Structural Adjustment Policies in Highly Indebted Countries." in J.Sachs *ed.*, *Developing Countries Debt and Economic Performance* Vol 2, Chicago: University of Chicago Press.
- Edwards, Sebastian. 1993. "Exchange Rates as Nominal Anchors." *Weltwirtschaftliches Archiv* 129.
- Edwards, Sebastian. 1997. "The Mexican Peso Crisis? How Much Did We Know? When Did We Know It?" National Bureau of Economic Research Working Paper. No. 6334.
- Edwards, Sebastian. 1998a. "Capital Inflows into Latin America: A Stop-Go Story?" National Bureau of Economic Research Working Paper. No. 6441.
- Edwards, Sebastian. 1998b. "Capital Flows, Real Exchange Rates, and Capital Controls: Some Latin American Experiences." National Bureau of Economic Research Working Paper. No. 6800.
- Edwards, Sebastian, and Alejandra Edwards. 1991. *Monetarism and Liberalization: The Chilean Experience*. Chicago, Ill.: University of Chicago Press.
- Edwards, Sebastian and Moshin Khan. 1985. "Interest Rate Determination in Developing Countries: A Conceptual Framework." *IMF Staff Papers*. 32. September.
- Edwards, Sebastian and Moises Naim. 1997. *Mexico 1994*. Washington, D.C.: Carnegie Endowment.
- Edwards, Sebastian and Julio Santaella. 1993. "Devaluation Controversies in the Developing Countries: Lessons from the Bretton Woods Era," In M. Bordo and B Eichengreen eds. *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*. Chicago: University of Chicago Press.
- Edwards, Sebastian and Miguel Savastano. 1997. "The Morning After: The Mexican Peso in the Aftermath of the 1994 Currency Crisis." National Bureau of Economic Research Working Paper No. 6516.
- Eichengreen, Barry and Paul Masson. 1998. "Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility." *International Monetary Fund Occasional Paper* No. 168.
- Eichengreen, Barry and Michael Mussa. 1998. "Capital Account Liberalization: Theoretical and Practical Aspects." *International Monetary Fund Occasional Paper* No. 172.
- Eichengreen, Barry and Andrew K. Rose. 1998a. "Staying Afloat when the Wind Shifts: External Factors and Emerging-Market Banking Crises." National Bureau of Economic Research Working Paper No. 6370. January

- Eichengreen, Barry and Andrew K. Rose. 1998b. "The Empirics of Currency and Banking Crises." Mimeo, University of California, Berkeley.
- Eichengreen, Barry, Andrew K. Rose and Charles Wyplosz. 1996. "Contagious Currency Crises." National Bureau of Economic Research Working Paper No. 5681
- Feldstein, Martin. 1998. "Refocusing the IMF." *Foreign Affairs* 77 March-April.
- Fischer, Stanley. 1994. "Comments on Dornbusch and Werner," *Brookings Papers on Economic Activity*, No. 1, 304-309.
- Fischer, Stanley. 1998. "The Asian Crisis: a View from the IMF." Address at the Midwater Conference of the Bankers' Association for Foreign Trade, Washington DC, January 22.
- Frankel, Jeffrey A., and Andrew Rose. 1996. "Currency Crashes in Emerging Markets: An Empirical Treatment." *Journal of International Economics*, 41, November 1996.
- Garber, Peter M. 1998. "Should the IMF Pursue Capital-Account Convertibility?" Princeton Essays in International Finance 207. Princeton University.
- Gavin, Michael, Ricardo Hausmann and Leonardo Leiderman. 1996. "The Macroeconomics of Capital Flows to Latin America: Experience and Policy Issues." In R Hausmann and L. Rojas-Suarez eds. *Volatile Capital Flows*. Washington, D.C.: Inter-American Development Bank.
- Gil Diaz, Franciscon and Agustin Carstens. 1996. "One Year of Solitude: Some Pilgrim Tales about the Mexican 1994-95 Crisis." *American Economic Review*, May.
- Gil Diaz and Carstens. 1997. "Pride and Prejudice: The Economics Profession and Mexico's Financial Crisis." In S. Edwards and M. Naim eds. *Mexico 1994*. Washington, D.C.: Carnegie Endowment.
- Goldfajn, Ilan and Rodrigo O. Valdes. 1997. "Capital Flows and the Twin Crises: the Role of Liquidity." International Monetary Fund Working Paper 97/87. July
- Goldfajn, Ilan and Rodrigo O. Valdes. 1998. "Are Currency Crises Predictable?" *European Economic Review*, 42. 874-885.
- Goldman Sachs. *Emerging Markets Economic Research*, Various Issues.
- Goldman Sachs. 1997. *The Foreign Exchange Market*, September.
- Goldstein, Morris. 1998. "The Asian Financial Crisis: Causes, Curses and Systematic Implications." *Policy Analyses in International Economics* No. 55, Washington D.C.: Institute for International Economics.
- Group of Thirty. 1995. "Mexico: Why Didn't Wall Street Sound the Alarm?" Group of Thirty, New York 1995.
- Hale, David. 1997. "Rubin's Folly?", *The International Economy*, September/October. 1997, 14-19.
- Hamilton, James. D. 1994. *Time Series Analysis*, Princeton University Press. Princeton: New Jersey.

- International Monetary Fund. 1997. *World Economic Outlook, Interim Assessment*. Washington DC. December.
- International Monetary Fund. 1998. *World Economic Outlook* . Washington D.C. May.
- Ito, Takatoshi. 1999. "Capital Flows in Asia." National Bureau of Economic Research Working Paper No. 7134.
- Kaminsky, Graciela and Carmen M. Reinhart. 1997. The Twin Crises: the Causes of Banking and Balance-of-Payment Problems." Mimeo, Federal Reserve Board.
- Krugman, Paul. 1994. "The Myth of Asia's Miracle." *Foreign Affairs*, November/December.
- Krugman, Paul. 1998a. "What Happened to Asia?" mimeo, MIT.
- Krugman, Paul 1998b. "Saving Asia: It's Time to get Radical." *Fortune*, September 7.
- Leiderman, Leonardo and Alfredo Thorne. 1995. "Mexico's 1994 Crisis and its Aftermath", mimeo, August.
- Litan, Robert E. 1998. A Three-Step Remedy for Asia's Financial Flu." *Brooking Policy Brief*. No 30, February.
- Loser, Claudio M. and Ewart S. Wiliams. 1997. "The Mexican Crisis and Its Aftermath: An IMF Perspective," In S. Edwards and M. Naim eds. *Mexico 1994*. Washington, D.C.: Carnegie Endowment.
- Massad, Carlos. 1998. "The Liberalization of the Capital Account: Chile in the 1990's." in S Fischer *et al*, "Should the IMF pursue Capital-Account Liberalization?" *Essays in International Finance* No.207, International Finance Section, Princeton University, May.
- McKinnon, Ronald and Huw Pil. 1996. "Credible Liberalization and International Capital Flows: the Overborrowing Syndrome." In T. Ito and A.O. Krueger eds. *Financial Deregulation and Integration in East Asia*, Chicago: The University of Chicago Press.
- Milesi-Ferretti, Gian Maria and Assaf Razin. 1996. "Sustainability of Persistent Current Account Deficits." National Bureau of Economic Research Working Paper No. 5467.
- Milesi-Ferretti, Gian Maria and Assaf Razin. 1998. "Sharp Reduction in Current Account Deficits: an Empirical Analysis." *European Economic Review*, 42. 897-908.
- Mishkin, Frederic S. 1998. "International Capital Movements, Financial Volatility and Financial Instability." National Bureau of Economic Research Working Paper No. 6390.
- Obstfeld, M. 1997. "Open-Economy Macroeconomics: Developments in Theory and Policy." National Bureau of Economic Research Working Paper No. 6319.
- Organization for Economic Cooperation and Development. 1995. *OECD Economic Surveys: Mexico*.

- Radelet, Steven and Jeffrey Sachs. 1998. "The Onset of the East Asian Financial Crisis." National Bureau of Economic Research Working Paper No. 6880.
- Rebelo, Sergio. 1997. "What Happens when Countries Peg their Exchange Rates?: The Real Side of Monetary Reforms." National Bureau of Economic Research Working Paper No. 6168.
- Rodrik, Dani. 1998. "Who needs Capital-Account Convertibility?" in S Fischer *et al*, "Should the IMF pursue Capital-Account Liberalization?" *Essays in International Finance* No.207, International Finance Section, Princeton University, May.
- Sachs, Jeffrey, Aaron Tornell and Andres Velasco. 1995. "Lessons from Mexico." Mimeo, Harvard University, March.
- Sachs, Jeffrey, Aaron Tornell and Andres Velasco. 1996. "Financial Crises in Emerging Markets: The Lessons of 1995." *Brooking Papers on Economic Activity* No. 1, 147-217.
- Valdes-Prieto, Salvador and Marcelo Soto. 1996. "New Selective Capital Controls in Chile: Are They Effective?" Mimeo, Catholic University of Chile, Santiago.
- Wang, Yan and John D. Shilling. 1995. "Managing Capital Flows in East Asia." World Bank Discussion Paper.

ENDNOTES

¹ On the Mexican crisis see, for example, Leiderman and Thorne (1995), Sachs, Tornell and Velasco (1995), Calvo and Mendoza (1996), the papers in Edwards and Naim (1997), Edwards (1997), and those in the special issue of *the Journal of International Economics* (1996). The Mexican authorities' views can be found in Gil Diaz and Carstens (1996, 1997). The financial community perspective is in Group of Thirty (1995). For the World Bank perspective see Burki (1997); the IMF views are in Loser and Williams (1997). See also OECD (1995) and Birdsall et al (1997). On the East Asian crises see Corsetti, Pesenti and Roubini (1998), Radelet and Sachs (1998) and Ito (1999).

² See the studies cited in footnote 1.

³ See Edwards (1993) for a discussion on the role of fixed exchange rates as nominal anchors.

⁴ See Aspe (1993).

⁵ See D'Amato (1995).

⁶ In Edwards (1989) and Edwards and Santaella (1993) I had documented the connection between real exchange rate overvaluation and currency crises for more than 70 developing countries during the 1950-1982 period.

⁷ Edwards and Savastano (1998) discuss Mexico's post-1995 experience with a floating exchange rate.

⁸ Ades and Kaune (1997).

⁹ For an account of the crisis from the Bank of Mexico's perspective see Gil Diaz and Carstens (1997).

¹⁰ See Corsetti, Pesenti and Roubini (1998) and Sachs and Radelet (1998).

¹¹ Finance Minister Aspe (1993) devoted almost a full chapter of his book (Chapter 4) on the Mexican reforms to discussing the importance of bank supervision.

¹² This expression will hold for every period t ; I have omitted the subscript t in order to economize on notation.

¹³ The assumptions of constant λ and θ are, of course, highly simplifying.

¹⁴ As a result of this assumption, equation (3) overstates (slightly) the "sustainable" current account ratio.

¹⁵ Under the restrictive assumption that international inflation is equal to zero, this expression corresponds exactly to G-S equation (5). See Ades and Kaune (1997, p6)

¹⁶ This assumes that growth is not affected. If, as it is likely, it declines the required compression would be even larger.

¹⁷ This discussion draws partially on Edwards (1998b).

¹⁸ The tax equivalences estimated by Valdes-Prieto and Soto (1996) were updated to the end of 1997.

¹⁹ Cardoso and Goldfajn (1997) analyze a series of impulse response functions to a capital controls innovation in the Brazil.

²⁰ As Cardoso and Goldfajn (1997) have argued, capital controls in Latin America are likely to be endogenous. Thus, care should be taken in establishing the vectors ordering in the VAR estimation.