Draft for Conference Presentation

DOES THE CURRENT ACCOUNT MATTER?*

By

Sebastian Edwards

University of California, Los Angeles

And

National Bureau of Economic Research

November, 2000

Revised: December, 2000

---

* This paper has been prepared for presentation at the NBER's conference on "Crisis Prevention," Florida, January 2001.. I thank Alejandro Jara for excellent assistance. I have benefited from discussions with Ed Leamer and James Boughton.

I. Introduction

The currency crises of the 1990s shocked academics, international civil servants and policy makers alike. Most analysts had missed the financial weaknesses in Mexico and East Asia, and once the crises erupted almost every observer was surprised by their intensity.[1] This inability to predict major financial collapses has been considered as an embarrassment of sorts by the economics profession. As a result, during the last few years macroeconomists in academia, in the multilateral institutions and in investment banks have been frantically developing crisis "early warning" models. These models have focused on a number of variables, including the level and currency composition of foreign debt, debt maturity, the weakness of the domestic financial sector, the country's fiscal position, its level of international reserves, political instability, and real exchange rate overvaluation, among others. Interestingly, different authors do not seem to agree on the role played by current account deficits in recent financial collapses. While some analysts have argued that large current account deficits have been behind recent currency crisis, according to others the current account has not played an important role in many of these episodes.[2] The view that current account deficits have played a limited role in recent financial debacles in the emerging nations is clearly presented by U.S. Treasury Secretary Larry Summers who, in his Richard T. Ely lecture argued:

> "Traditional macroeconomic variables, in the form of overly inflationary monetary policies, large fiscal deficits, *or even large current account deficits,* were present in several cases, but are not necessary antecedents to crisis in all episodes." (Summers 2000, p. 7, emphasis added).

The purpose of this paper is to investigate in detail the behavior of the current account in emerging economies, and in particular its role – if any – in financial crises. Models of current account behavior are reviewed, and a dynamic model of current account sustainability is developed. The empirical analysis is based on a massive data set that

[1] It should be noted that the crises in Russia (August 1998) and Brazil (January, 1999) were widely anticipated.

[2] For discussions on the causes behind the crises see, for example, Corsetti et. al. (1998), Sachs, et al (1998), the essays in Dornbusch (2000), and Edwards (1999).

covers over 120 countries during more than 25 years. Important controversies related to the current account – including the extent to which current account deficits crowd out domestic savings – are also analyzed. The rest of the paper is organized as follows: In Section II I review the way in which economists' *policy views* on the current account have evolved in the last 25 years or so. The discussion deals with academic as well as with policy perspectives, and includes a review of evolving theoretical models of current account behavior. The analysis presented in this section shows that there have been important changes in economists' views on the subject: from "deficits matter," to "deficits are irrelevant if the public sector is in equilibrium," back to "deficits matter," to the current dominant view "deficits *may* matter." In this section I argue that "equilibrium" models of frictionless economies are of little help to understand actual current account behavior and/or to assess a country's degree of vulnerability. In Section III I focus on models of the current account sustainability. More specifically, I analyze models built in an effort to assess emerging markets' vulnerability. I argue that simple application of these sustainability models can lead to highly misleading conclusions. In order to illustrate this point I develop a simple model of current account behavior that emphasizes the role of stock adjustments. In Section IV I use a massive data set to analyze some of the most important aspects of current account behavior in the world economy during the last quarter century. The discussion deals with the following issues: (a) The distribution of current account deficits across countries and regions. (b) The relationship between current account deficits, domestic savings and investment. (c) The effects of capital account liberalization on capital controls on the current account. (d) An analysis of the circumstances surrounding major current account reversals. I investigate, in particular, how frequent and how costly these reversals have been. In Section V I deal with the relationship between current account deficits and financial crisis. I review the existing evidence and I present some new results. Finally, Section VI contains some concluding remarks.

II. Evolving Views on the Current Account: Models and Policy Implications

In this section I analyze the evolving view on current account deficits. I focus both on theoretical models as well as on policy analyses. I show that economists' views have changed in important ways during the last twenty five years. I argue that many of

these changes have been the result of important crisis situations in both the advanced and the emerging nations.

II.1 The Early Emphasis on Flows

In the immediate post-World War II period most discussions on a country's external balance were based on the elasticities approach, and focused on flows behavior. Even authors that understood fully that the current account is equal to income minus expenditure – including Meade (1950), Harberger (1950), Metzler (1950), Machlup (19xx), and Johnson (1958) --, tended to emphasize the relation between relative price changes and trade flows.[3]

This emphasis on elasticities and the balance of trade also affected policy discussions in the developing nations. Indeed, until the mid-1970s policy debates in the less developed countries were dominated by the so-called "elasticities pessimism" view, and most authors focused on whether a devaluation would result in an improvement in the country's external position, including in its trade and current account balances. Cooper's (1971, 1971a) influential work on devaluation crisis in the developing nations is a good example of this emphasis. In these papers Cooper analyzed the consequences of 21 major devaluations in the developing world in the 1958-1969 period, focusing on the effect of these exchange rate adjustments on the real exchange rate and on the balance of trade. According to Cooper (1971a), although the relevant elasticities were small in the developing countries, the record suggested that overall the devaluations in his sample had been successful in helping improve the trade and current account balances. In an extension of Cooper's work, Kamin (1988) found that historically (large) devaluations tended to improve developing countries' trade balance.

Authors in the structuralist tradition argued that, since the developing nations exported mostly commodities, devaluations were ineffective, and tended to result in a contraction in economic activity (Diaz Alejandro 1963). According to this perspective, trade and current account imbalances were "structural" in nature, and severely constrained poorer countries' ability to grow. According to this view, however, the solution was not to adjust the country's peg, but to encourage industrialization through

[3] See, for example, Meade's (1950) discussion in pages 35-36.

import substitution policies. In Latin America this view was persuasively articulated by Raul Prebisch, the charismatic Executive Secretary of the *U.N. Economic Commission for Latin America* (CEPAL); in Asia it found its most respected defender in Professor Mahalanobis, the father of planning and the architect of India's Second Five Year Plan; and in Africa it was made the official policy stance with the *Lagos Plan of Action* of 1980.

II.2 The Current Account as an Intertemporal Phenomenon: The Lawson Doctrine and the 1980s Debt Crisis

During the second part of the 1970s, and partially as a result of the oil price shocks, most countries in the world experienced large swings in their current account balances. Between 1973 and 1979, for example, the developed countries' aggregate current account moved from a US$ 11 billion dollars surplus to a US$ 28 billion dollars deficit. In. Naturally, the counterpart of these movements was a huge increase in OPEC's surpluses: from US$ 5 billion in 1973 to US$ 40 billion in 1979.[4]

These developments generated significant concern among policy makers and analysts, and prompted a number of experts to analyze carefully the determinants of the current account. Perhaps the most important analytical development during this period was a move away from trade flows, and a renewed and formal emphasis on the intertemporal dimensions of the current account. The departing point was, of course, very simple, and was based on the recognition of two interrelated facts. First, from a basic national accounting perspective the current account is equal to savings minus investment. Second, since both savings and investment decisions are based on intertemporal factors -- such as life cycle considerations and expected returns on investment projects --, the current account is necessarily an intertemporal phenomenon. Sachs (1981) emphasized forcefully the intertemporal nature of the current account, arguing that, to the extent higher current account deficits reflected new investment opportunities, there was no reason to be concerned about them. In Sachs' (1981, p. 211)

[4] These are nominal numbers. Inflation-adjusted numbers are almost as impressive, however. These data are from the International Monetray Fund's IFS.

words, "in a world of capital mobility, shifts in investment opportunities lead to corresponding shifts in the current account."[5]

II.2.1 Theoretical Issues

Obstfeld and Rogoff (1996) have provided a comprehensive review of modern models of the current account that assume intertemporal optimization on behalf of consumers and firms. In this type of models, consumption smoothing across periods is one of the fundamental drivers of the current account. The most powerful insight of the modern approach to the current account can be expressed in a remarkably simple equation. Assuming a constant world interest rate, equality between the world discount factor [1/(1+r)] and the representative consumer's subjective discount factor β, and no borrowing constraints, the current account deficit (CAD) can be written as:[6]

$$(1) \qquad CAD_t = (Y_t^* - Y_t) - (I_t^* - I_t) - (G_t - Gt^*),$$

where Y_t, I_t, and G_t are current output, consumption and government spending, respectively. Y_t^*, I_t^*, and G_t^*, on the other hand, are the "permanent" levels of these variables. The permanent value of Y, in turn, is defined as its annuity value at the ongoing interest rate:

$$(2) \qquad Y_t^* = [r/(1+r)] \, \Sigma_{j=t} [r/(1+r)]^{j-t} \, Y_j.$$

The sum runs from j=t to infinity. Equation (2), then defines the permanent value of Y as the annuity value computed at the constant interest rate r. The definitions of I_t^* and G_t^* are exactly equivalent to that of Y_t^* in equation (2).

According to equation (1), if output falls below its permanent value, $(Y_t^* - Y_t) > 0$, there will be a higher current account deficit. Similarly, if investment increases above

---

[5] During the early 1980s there were also a number of theoretical developments regarding the intertemporal approach to the current account. Early work includes the paper by Svensson and Razin (1983), Frenkel and Razin (1987) and Edwards and van Wijnbergen (1986). I discuss the most salient of these models in section III of this paper.

[6] Obstfeld and Rogoff (1996, p. 74). For models that generate similar expressions see, for example, Svansson and Razin (1983) , Frenkel and Razin (1987) and Edwards (1989).

its permanent value, there will be a higher current account deficit. The reason for this is that new investment projects will be partially financed with an increase in foreign borrowing, thus generating a higher current account deficit. Likewise, an increase in government consumption above Gt* will result in a higher current account deficit. Although equation (1) is very simple, it captures the fundamental insights of modern current account analysis. Moreover, extensions of the model, including the relaxation of the assumption that the subjective discount factor is equal to the world discount factor, do not alter its most important implications. If, however, the constant world interest rate assumption is relaxed, the analysis becomes somewhat more complicated. In this case the current account deficit will be fundamentally affected by the country's net foreign assets position, and by the relationship between the world interest rate and its "permanent" value, r_t*. Under the assumption of a variable world interest rate, equation (1) becomes:

$$(3) \qquad CAD_t = (Y_t^* - Y_t) - (I_t^* - I_t) - (G_t - Gt^*) - (r_t^* - r_t) B_t - \xi_t,$$

where B_t is the country's net foreign asset position. If the residents of this country are net holders of foreign assets, $B_t > 0$.[7] ξ_t is a consumption adjustment factor that arises form the fact that the world discount factor is not any longer equal to the consumers' subjective discount factor. Notice that under most plausible parameter values, ξ_t is rather small. An important implication of equation (3) says that if the country is a net foreign debtor ($B_t < 0$), and the world interest rate exceeds its permanent level the current account deficit will be higher.

A number of versions of optimizing models of the current account have appeared in the literature since the 1980s. Svensson and Razin (1983), for example, built a fully optimizing framework to explore the validity of the Laursen-Metzler-Harberger condition developed in the 1950s, and concluded that the insights form these early models were largely valid in a fully optimizing, two period, general equilibrium model. Edwards and van Wijnbergen (1986) explored the current account implications of alternative speeds of trade liberalization. They found out that in a framework where the country in question

faced a borrowing constraint, a gradual liberalization of trade was preferred to a cold-turkey approach. Frenkel and Razin (1987) analyzed the way in which alternative fiscal policies affected the current account balance through time. Edwards (1989) introduced nontradable goods, in an effort to understand the connection between the real exchange rate and the current account through time. Sheffrin and Woo (1990) used an annuity framework to develop a number of specific testable hypotheses from the intertemporal framework. Gosh and Ostry (1995) tested the intertemporal model using data for a group of developing countries. They argue that, overall, their results adequately capture the most important features of current account performance in their sample.

Numerical simulations based on the intertemporal approach sketched above, suggest that the optimal response to exogenous shocks is to run *very high* current account deficits. These large deficits are, of course, the mechanism through which the country nationals' smooth consumption. An important consequence of this result is that a small country can accumulate a very large external debt, and will run a sizeable trade surplus in the steady state. As it turns out, however, in these models both the external accounts and the external debt ratios will tend to reach levels that are ***not*** observed in reality. Obstfeld and Rogoff (1996), for example, develop a model of a small open economy with AK technology, and a constant rate of productivity growth that exceeds world productivity growth. This economy faces a constant world interest rate r, and no borrowing constraint. Under a set of plausible parameters, the steady state trade surplus is equal to 45 percent of GDP, and the steady state debt to GDP ratio is equal to 15.[8] Needless to say, neither of these figures have been observed in modern economies (on actual distributions of the current account see the discussion in Section IV of this paper.) Fernandez de Cordoba and Kehoe (1999) developed an intertemporal model of a small economy to analyze the effects of lifting capital controls on the dynamics of the current account. The basic version of their model assumes both tradable and nontradable goods, physical capital and internationally traded bonds, and no borrowing constraint. An important feature of the model – and one that sets it apart from that of Obstfeld and Rogoff (1996) discussed above --, is that technological progress in the country in

---

[7] See Obstfeld abd Rogoff (1996).

[8] Ostfeld and Rogoff (1996) do not claim that this model is particularly realistic. In fact, they present its implications to highlight some of the shortcomings of simple intertemporal models of the current account.

question is equal to that of the rest of the world. The authors calibrate the model for Spain's case, and find that the optimal response to a financial reform is to run a current account deficit that peaks at 60% of GDP.[9] As the authors themselves acknowledge, this figure tends to contradict what is observed in reality. In fact, in Spain's case, following the financial liberalization reform, the current account deficit peaked at 3.4% of GDP.

The fact that these models predict *optimal* levels of the current account deficit that are an order of magnitude higher than those observed in the real world poses a important challenge for economists. A number of authors have tried to deal with these disturbing results by introducing adjustment costs and other type of rigidities into the analysis. Blanchard (1983), for example, developed a current account model with investment installation costs to investigate the dynamics of debt and the current account in a small developing economy, such as Brazil. A simulation of this model for feasible parameter values indicated that a country such as Brazil should accumulate foreign debt in excess of 300% its GNP. Moreover, according to this model, in the steady state the country in question should run a trade surplus equal to 10 percent of GDP. Although these numbers are not as extreme as those obtained from simple models without rigidities, they are quite implausible, however, and are not usually observed in the real world. Fernandez de Cordoba and Kehoe (1999) introduced a series of extensions to their basic model in an effort to generate more plausible simulation results. They showed that it was not possible to improve the results by simply imposing a greater degree of curvature into the production possibility frontier. They also show that assuming costly and slow factor mobilty across sectors they could generate more modest – although still very high from a historical perspective -- current account deficits in their simulation exercise.

II.2.2 Policy Interpretations of the Intertemporal Approach

An important policy implication of the intertemporal perspective is that policy measures that result in higher investment opportunities will, necessarily, generate a deterioration in the country's current account. According to this view, however, this type of worsening of the current account balance should ***not*** be a cause for concern or for

[9] Their analysis is carried on in terms of the trade account balance. In this model there are no differences between the trade and current account balances.

policy action. This reasoning led Sachs (1981, p. 243) to argue that the rapid increase in the developing countries foreign debt in the 1978-1981 period was not a sign of increased vulnerability. It is interesting to quote Sachs extensively:

> "The manageability of the LDC debt has been the subject of a large literature in recent years. If my analysis is correct, much of the growth in LDC debt reflects increased in investment and should not pose a problem of repayment. *The major borrowers have accumulated debt in the context of rising or stable, but not falling, saving rates.* This is particularly true for Brazil and Mexico…" (Sachs 1981, p. 243. Emphasis added).

This view was also endorsed by Robischek (1981), one of the most senior and influential IMF officials during the 1970s and 1980s. Commenting on Chile's situation in 1981 – a time when the country's current account deficit surpassed 14% of GDP --, he argued that to the extent that the public sector accounts were under control and that domestic savings were increasing, there was absolutely no reason to worry about major current account deficits. As it turned out, however, shortly after Robischek expressed his views, Chile entered into a deep financial crisis that ended up with a major devaluation, the bankruptcy of the banking sector, and a GDP decline of 14%.[10] The argument that a large current account deficit is not a cause of concern if the fiscal accounts are balanced has been associated with former Chancellor of the Exchequer Nigel Lawsosn, and has become to be known as *Lawson's Doctrine*.

The respected Australian economist Max Corden has possibly been the most articulated exponent of the intertemporal policy view of 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 new view,

[10] See Edwards and Edwards (1991) for details.

> "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* (Corden 1994, p. 92, emphasis added)."

The key issue, according to this view, is that the country in question is not facing a "twin deficits" situation -- that is a situation where there are joint current account and public sector imbalances. If there is only a large current account deficit, with no public accounts disequilibria, policy makers can relax. The private sector will take the necessary corrective measures.

The eruption of the debt crisis in 1982 suggested that some of the more important policy implications of the new (intertemporal) view of the current account were subject to important flaws. Indeed, some of the countries affected by this crisis had run very large current account deficits in the presence of increasing investment rates, and/or balanced fiscal accounts. In that regard he case of Latin America is quite interesting. With the exception of oil-producer Venezuela, current account deficits skyrocketed in 1981. This was the case in countries with increasing investment, such as Brazil and Mexico, as well as in countries with a balanced fiscal sector *and* rising investment, such as Chile.

II.3 Views on the Current Account in the Post 1982 Debt Crisis Period

After the eruption of the debt crisis in 1982, most of the developing world was severely hit by the sudden drying up of international capital. Latin America was affected in a particularly serious way. Net transfer of resources to that region turned negative, and between 1982 and 1986 the annual net transfer averaged -$26.4 billion, compared with a positive average net transfer of more than $12 billion a year between 1976 and 1981. In real 1983 dollars, the net turnaround of resource transfers exceeded $70 billion in the three short years between 1980 and 1983. During this early phase, very rapid adjustments in the current account and trade balance were achieved by contractions in imports and in investment. The real value of imports in Latin America and the Caribbean came down almost 25% between 1982 and 1987. In most countries, this compression was concentrated on imports of capital goods and intermediate inputs,

seriously affecting future growth. For the major debtors -- Argentina, Brazil, Chile, Colombia, Mexico and Venezuela -- it dropped from 19% of GDP to 16%. In most countries, public investment (including that for infrastructure) and investment in construction were severely curtailed.

As the debt crisis dragged on, many analysts began to refer to the 1980s as Latin America's lost decade. In trying to explain the antecedents of the crisis, most observers focused on both external and domestic causes, including the deterioration of the terms of trade and, in some countries, very large fiscal imbalances. According to a number of observers, one of the debt crisis most important lessons was that overvalued real exchange rates resulted in considerable vulnerability that more often than not could ignite major currency collapses.

In light of the debt crisis, a number of authors explicitly moved away from the implications of the *Lawson Doctrine,* and argued that large current account deficits were often a sign of trouble to come, even if domestic savings were higher. Fischer (1988) made this point forcefully in an article on real exchange rate overvaluation, whose intended readership were policy makers:

> "The primary indicator is the current account deficit. Large actual or projected current account deficits – or, for countries that have to make heavy debt repayments, insufficiently large surpluses --, are a call for devaluation." (p. 115).

An important point raised by Fischer was that what matters was not whether there was a large deficit, but whether the country in question is running an "unsustainable" deficit. In his words, "if the current account deficit is 'unsustainable'…or if reasonable forecasts show that it will be unsustainable in the future, devaluation will be necessary sooner or later." (p.115). In the aftermath of the 1990s crises, and as will be discussed in Section III of this paper, the issue of current account sustainability moved decisively to the center of the policy debate. In the aftermath of the 1982 debt crisis Cline (1989) also emphasized the importance of the capital account deficits, as did Kamin (1988, p. 14), whose extensive empirical work suggested that the trade and current accounts "deteriorated steadily through the year immediately prior to devaluation." In their

analysis of the Chilean crisis of 1982 Edwards and Edwards (1987, 1991) argued that Chile's experience – where a 14% current account deficit was generated by private sector-induced capital inflows --, showed that the *Lawson Doctrine* was seriously flawed.

II.4 The Surge of Capital Inflows in the 1990s, the Current Account and the Mexican Crisis

During much of the 1980s the majority of the developing countries were cut from the international capital markets, and either run current account surpluses or very small deficits. This was even the case for the so-called "East Asian Tigers," which had not been affected by the debt crisis. Indeed, between 1982 and 1990 Hong Kong, Korea and Singapore posted current account surpluses, while Indonesia, Malaysia, the Philippines and Thailand run moderate deficits – Indonesia and Thailand deficits were the highest in the group, averaging 3.2 % of GDP.

Starting in 1990 the a large number of emerging countries were able, once again, to attract private capital. This was particularly the case in Latin America, where by 1992 the net volume of funds had become so large ¥¥ exceeding 35 percent of the region's exports ¥¥ that a number of analysts began to talk about Latin America's "capital inflows problem" (Calvo et al 1993; Edwards 1993). To many analysts this sudden change from capital scarcity and negative resource transfers to foreign capital overabundance was surprising and reflected a surge in speculation in international markets. To others, the fact that merely a dozen years after a major crisis these countries were able to tap the international market, reflected the success of the market-oriented reforms. If the market is willing to reward these countries with plentiful funds, the argument went, it must reflect that the reforms are bearing fruit. Naturally, the counterpart of these large capital inflows was a significant widening in capital account deficits, as well as a rapid accumulation of international reserves.

During the first half of the 1990s an increasingly large fraction of capital flows into the merging nations were portfolio flows. These portfolio flows took two basic forms: equities acquisitions – mostly in the form of American Depository Receipts (ADRs)—by foreign investors, and bond issues in international markets. The World Bank (1997) has reported that an increasing number of institutional investors (including

pension funds) in the advanced countries are adding emerging economies equities to their portfolios. This heavy reliance on equities and bonds contrasts with the 1970s, when syndicated bank loans constituted the dominant form of private capital inflows into Latin America. Calvo et al (1993) provided an early, and very influential, study on the determinants of capital inflows into the region. These authors argue that cyclical external factors have been by far the most important determinant of these flows. These results were confirmed by the World Bank's (1997) massive study on private capital inflows to the developing countries. Second, the improvement in Latin America's economic prospects – including the reduction in country risk that has been associated with the implementation of market oriented reforms – has increased the attractiveness of these countries to international investors. In an extension of the Calvo et al (1993) study, Chuhan and associates (1993) found out that the recipient country's own fundamentals were as important as cyclical factors in explaining the surge in portfolio flows into Latin America. Calvo et al (1993, 1995). argued that very large capital inflows – and the corresponding large current accounr deficits -- created three type of problems for policy makers. First, capital inflows induce a real exchange rate appreciation, and a loss of competitiveness; 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. That is, they argued that large current account deficits – especially those financed with portfolio flows --, could indeed generate large crisies.

Interestingly enough, during the first half of the 1990s there was a resurgence of Lawson's Doctrine in some policy circles. This was particularly the case in analyses of the evolution of the Mexican economy during the early 1990s. 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, since 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 bee a cause for undue concern.* (p. 179-80, emphasis added)"

Interestingly enough, this view is still defended by some of the most senior Mexican officials at the time. For instance, in his recently published memoirs former President Carlos Salinas de Gortari (2000), argues that the very large current account deficit was not a cause of the December 1994 crisis. In making his point, former President Salinas argues that two of the most influential cabinet members – Secretary of Commerce Jaime Serra and Secretary of Programming Ernesto Zedillo -- had pointed out that, since the public sector finances were under control the large current account deficit was not a cause for concern.[11]

Not everyone, however, agreed with this position. In the 1994 Brookings Panel session on Mexico, Stanley Fischer supported the view that large current account deficits are dangerous. He argued that:

> "[t]he 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).

As early as 1993, the World Bank staff expressed concern about the widening current account deficit. This was particularly serious, the Bank said because during that time domestic savings had been declining. More specifically, in *Trends in Developing Economies 1993*, the Bank staff said: "In 1992 about two-thirds of the widening of the current account deficit can be ascribed to lower private savings…If this trend continues, it could renew fears about Mexico's inability to generate enough foreign exchange to service debt…" (World Bank 1993, p. 330).

---

[11] See Salinas de Gortari (2000), pages 1091 through 1094.

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.

II.5 Views on the Current Account in the Aftermath of the Financial Crises of the 1990s

In the aftermath of the Mexican crisis of 1994, a large number of analysts maintained, once again, that *Lawson's Doctrine* was seriously flawed. In an address to the Board of Governors of the Interamerican Development Bank, Larry Summers (1995a, p.46), then the US Deputy Secretary of the Treasury, was extremely explicit when he said "current account deficits cannot be assumed to be benign because the private sector generated them." This position was also been taken by the IMF in post-mortems of the Mexican debacle. 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."

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, Peseneti, and Roubini (1998) analyzed 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 Manhatan 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, 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 East Asia 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 (Edwards 1999). 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 current account ratio analyses are bound to generate misleading results.

II.4.1 New Theoretical Emphases

After the Mexican peso crisis the theoretical interest moved towards models with borrowing constraints. In this setting the nationals of the country in question cannot borrow as much as they wish from the international financial market. An upward sloping supply for foreign funds limits their ability to smooth consumption. An appealing feature of models with a borrowing constraint is that, the optimal current account deficit does not take the type of implausible values generated by small country models. Moreover, in these models, changes in the level of the borrowing constraint – generated by changes in the lender's expectations, for example -- can indeed result in currency crises. In an early precursor, Edwards and van Wijnbergen (1986) developed a two-period fully optimizing model with tradable and non-tradable goods. In this setting, if the country faces a very large current account deficit in the first period, it will need to engineer a large real depreciation in the second period. This, in fact, can be large enough as to classify as a "currency crisis." More recently Atkenson ad Rios-Rull (1996) developed a model of a credit constrained country, where current account problems arise even if fiscal and monetary policies are consistent. In this setting, and in contrast with the basic exchan ge

rate crisis models developed by Krugman (1979) and Obstrfeld (1986) the current account imbalance is an important precursor to a currency crisis. A number of authors have taken a different tack, and have developed crises models where the current account does not have to play an important role. Calvo (2000) is a good representative of this research strategy. In his model a currency crisis responds to financial fragilities in the country in question. A particularly important fragility is the mismatch between the maturity of banks' assets and obligations.[12]

II.4.2 The Shift Toward Current Account Sustainability

The Mexican episode prompted policy analysts to closely monitor current account developments. In fact, immediately following the Mexican crisis the view among many private sector (investment bank) analysts was 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. The need to avoid dangerously large deficits was also present in in academic and official sector discussions. In an influential paper Milesi-Ferreti and Razin (1996) asked:

> "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 Kuane (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 et al (1996b) who argued that, contrary to popular accounts, high current account deficits did not explain the turmoil of 1995. A similar perspective was taken by Calvo et al (1996). In a detailed analysis of more than 100 currency crashes Frankel and Rose (1996) found that current account deficits had not been a determinant

[12] See also Chang and Velasco (2000).

of currency collapses in the 1970-1991 period. Goldstein et al (2000) used an innovative signal-extracting methodology to analyze the power of alternative early warning indicators. They define a crisis as a situation where a country suffers a sharp decline in its stock of international reserves and/or a large depreciation. These authors found that large current account deficits were one of the most powerful annual early indicators of a currency crisis. I return to these studies in Section III of this paper.

In spite of these disagreements, the concern with large current account deficits was serious enough as 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. In the section that follows I evaluate the usefulness of current account sustainability models in greater detail.

III. How Useful are Models of Current Account Sustainability?

As mentioned in the preceding section, in the aftermath of the Mexican crisis many analysts argued that the so-called "new" view of the current account – based on Lawson's Doctrine -- 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 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)." Analyses of current account sustainability have become particularly popular among investment banks. For instance, Goldman-Sachs *GS-SCAD* Model developed in 1997 has become popular among analysts interested in assessing emerging nations' vulnerability. More recently, Deutsche Bank (2000) has developed a model of current account sustainability both to analyze whether a particular

country's current account is "out of line," and to evaluate the appropriateness of its real exchange rate.

The basic idea behind sustainability exercises is captured by the following simple analysis. As pointed out, 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:

$$(4) \qquad \delta_j = \alpha_j \, (W - W_j) - (1 - \alpha_{jj}) W_j ;$$

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:[13]

$$(5) \qquad \delta_j = \{\alpha_j \, \theta_j - (1 - \alpha_{jj}) \} \lambda_{jj} Y_j ;$$

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,

$$(6) \qquad \delta_j = \gamma^*_j \, Y_j .$$

Equation (6) 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.[14]

In this framework, and under the simplifying assumption that international reserves don't change, the "sustainable" current account ratio is given by:[15]

$$(7) \qquad (C/Y)_j = \{ g_j + \pi^*_j) [\{\alpha_j \theta_j - (1 - \alpha_{jj}) \} \lambda_{jj}],$$

where g_j is the country's sustainable rate of growth, and π^*_j is a valuation factor (approximately) equal to international inflation.[16] 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 1 contains G-S's estimates of γ^*_j, while Table 2 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

---

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

[14] The assumptions of constant λ and θ are, of course, highly simplifying.

[15] As a result of this assumption, equation (6) overstates (slightly) the "sustainable" current account ratio.

[16] Under the restrictive assumption that international inflation is equal to zero, this expression corresponds exactly to G-S equation (8). See Ades and Kaune (1997, p6)

presented in Table 2, 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 run 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 2000).

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 (8) 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.

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

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 (7) 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 (8), in the long run steady state, when $(\gamma^*_t = \gamma^*_{t-1})$, and $(CY)_{t-1} = (C/Y)$, 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 (9).

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

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 1, by the end of 1996 there was a significant gap

between Goldman-Sachs estimates of foreigners' desired holdings of Mexican and Argentine liabilities: while the Mexican ratio stood at 38.3% of the county'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 it initial level, and that the demand for Mexican liabilities increases to 43% of Mexican GDP. Figure 1 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 2). Second, the current account converges to 2.15% of GDP, as suggested by equation (7). 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 a level in excess of 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 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.[17]

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. Current Account Behavior since the 1970s

In this section I provide a very broad analysis of current account behavior in both emerging and advanced countries. The focus is on stylized facts, and an effort is made to establish orders of magnitude. The section deals with four specific issues: (1) the distribution of the current account across regions. (2) The persistence of high current account deficits. (3) A brief discussion of current account reversals and their costs. (3) The relationship between *capital account* liberalization and large current account deficits.

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

The discussion of the relationship – if any – between current account deficits and financial crises is the subject of section V.

IV.1 The Distribution of Current Account Deficits in the World Economy

In this subsection I use data for 149 countries during 1970-1997 to analyze some basic aspects of current account behavior. I am particularly interested in understanding the magnitudes of deficits through time. This first look at the data should help answer questions such as "From a historical point of view, is 4% of GDP a large current account deficit?" "From a historical perspective, for how long have countries been able to run 'large' current account deficits?" The data has been obtained from the World Bank comparative data set. However, when data taken from the IMF's *International Financial Statistics* are used the results obtained are very similar. Throughout the analysis I have concentrated on the current account *deficit* as a percentage of GDP; that is, in what follows, a positive number means that the country in question, for that particular year, has run a current account deficit. In order to organize the discussion I have divided the data into six regions: (1) Industrialized countries; (2) Latin America and the Caribbean; (3) Asia; (4) Africa; (5) Middle East and Northern Africa; and (6) Eastern Europe. In Table 3 I present the number of countries in each region and year for which there are data available. This table summarizes the largest data set that can be used in empirical work.. As will be specified later, in some of the empirical exercises I have restricted the data set to countries with population above half a million people, and income per capita above $ 500 in 1985 PPP terms. For a list of the countries included in the analysis, and for a detailed description of the data see the Appendix.

Tables 4, 5 and 6 contain basic data on current account deficits by region for the period 1970-1997. In Table 4 I present averages by region and year. Table 5, on the other hand, contains medians for the current account deficits. Finally, in Table 6 I present the third quartile by year and region. I have used the data on the third quartile presented in this table to as cut-off points to define "high deficit" countries. Later in this section I analyze the persistence of high deficits in the different regions.

A number of interesting features of current account behavior emerge from these tables. First, after the 1973 oil-shock there were important changes in current account

balances in the industrial nations, the Middle East and Africa. Interestingly, no discernible change can be detected in Latin America or Asia. Second, and in contrast with the previous point, the 1979 oil shock seems to have affected current account balances in every region in the world. The impact of this shock was particularly severe in Latin America, where the deficit jumped from an average of 3.4% of GDP in 1978 to over 10% of GDP in 1981. Third, these Tables capture vividly the magnitude of the external adjustment undertaken by the emerging economies in the 1980s. What is particularly interesting, is that contrary to popular folklore, this adjustment was not confined to the Latin American region. Indeed, the nations of Asia and Africa also experienced severe reductions in their deficits during this period. Fourth, the industrialized countries went back to having sustained surpluses only after 1993. And fifth, during the most recent period current account deficits have been rather modest from a historical perspective. This has been the case in every region, with the important exception of Eastern Europe.

The data on third quartiles presented in Table 6 show that 25 % of the countries in our sample had, at one point or another, a current account deficit in excess of 7.22% of GDP. Naturally, as the table shows, the third quartile differs for each region and year, with the largest values in Africa and Latin America. I use the third quartile data in Table 6 to define "large current account deficit" countries. In particular, if, during a given year, a particular country's deficit exceeds its region's third quartile, I classify it as being a "high deficit country."[18] An important policy question is how persistent are high deficits? I deal with this issue in Table 7, where I have listed those countries that have had a "high current account deficit" for at least five years in a row. The results are quite interesting, and indicate that a rather small number of countries experienced very long periods of high deficits. In fact, I could detect only 11 countries with "high deficits" for ten or more years. And of these, five are in Africa, three are in Asia and, surprisingly perhaps, only two are in Latin America and the Caribbean. Interestingly enough, Australia and New Zealand are among the very small group of countries with a streak of

[18] Notice, however, that the actual cut-off points correspond to fairly large deficits even for the Middle East Countries.

high current account deficits in excess of ten years. In the subsection that follows I will analyze some of the most important characteristics of deficits reversals.

IV.4 Current Account Reversals: How Common, How Costly?

In this subsection I provide an analysis of current account reversals. In particular I ask three questions: First, how common are large current account deficit reversals? Second, from a historical point of view, have these reversals been associated with a currency or financial crisis? And third, how costly, in terms of output growth, have these reversals been? With respect to this third point, I argue that the most severe effect of current account reversals on economic performance take place indirectly, through their impact on investment. The analysis presented in this subsection complements the results in a recent important paper by Milesi-Ferreti and Razin (2000).[19]

I use two alternative definitions of current account reversals: (1) *Reversal1* is defined as a reduction in the deficit of at least three percent of GDP in one year. (2) *Reversal2* is defined as a reduction of the deficit of at least 3% of GDP in a three year period. Due to space considerations the results reported here correspond to those obtained when the *Reversal1* definition was used. However, the results obtained under the alternative – and less strict – definition *Reversal2* where very similar to those discussed in this subsection.[20]

The first question I ask is how common are reversals. This issue is addressed in Table 8, where I present tabulations by region, as well as for the complete sample, for the *Reversal1* variable. As may be seen, for the sample as a whole the incidence of "reversals" was equal to 16.7% of the yearly episodes. This reversal occurrence varied across regions; not surprisingly, given the definition of reversals, the lowest incidence is in the industrialized countries (6%). The two highest ones are in Africa and in the Middle East, with 27 and 26 percent respectively. Both from a theoretical, as well as from a policy perspective, it is important to determine whether these reversals are short lived, or whether they are sustained. Short-term reversals may be the result of consumption smoothing, while more permanent ones are likely to be the consequence of

---

[19] My data set, however, is larger that that of Milesi-Ferreti and Razin (2000).

[20] These definitions of reversal are somewhat different than those used by Milesi-Ferreti and Razin (2000).

policy-related external adjustments. I address this issue by asking in how many "reversal" cases the current account deficit was still lower three years after the reversal was detected. The answer is in the two-way tabulation tables presented in Table 9.[21] These results indicate that for the sample as a whole, 45 percent of the "reversals" were translated into a medium (three year) improvement in the current account balance. The degree of permanency of these reversals varied by region, however. In the advanced countries 75% of the reversals were sustained after three years; the smallest percentage corresponds to the Latin American nations where 37% of the reversals were sustained after three years.

In their influential paper, Milesi-Ferreti and Razin (2000) analyzed the effects of current account reversals on economic performance, and in particular on GDP growth. They used two methods to address this issue: They first used a "before and after" approach, and tentatively conclude that "reversals in current account deficits are not necessarily associated with domestic output compression." (page 302). Since "before and after" analyses are subject to a number of serious shortcomings, they also address the issue by estimating a number of multiple regressions on different samples. Their dependent variable is the rate of per capita output growth, and the independent variables include a measure of exchange rate overvaluation, an index of openness, the level of indebtedness, initial GDP and the investment to GDP ratio, among other. After analyzing the results obtained from this regression analysis the authors argue that "reversals…are not systematically associated with a growth slowdown." (Milesi-Ferreti and Razin 2000, p. 303).

Milesi-Ferreti and Razin (2000) reach this conclusion after estimating growth equations that control for investment (among other variables). It is possible, however, that current account reversals affect *investment itself*, and that through this channel they impact on real GDP growth. The reason for this potential effect of reversals is rather simple: investment is financed by the sum of national and foreign savings. The latter, of course, is exactly equal to the current account deficit. Thus, any current account reversal will imply a reduction in foreign savings. What will happen to aggregate savings – and

[21] This Table includes only countries with population greater than half a million people and GDP per capita above $500. It also excludes countries whose current account was in surplus.

thus, to investment – will depend on the relationship between foreign and national savings. The existing empirical evidence on this matter strongly suggests that foreign savings partially, and only partially, crowd out domestic savings. Edwards (1996), for example, estimated private savings equations for developing countries, and found out that the coefficient of the current account deficit was in the neighborhood of –0.4. Loayza et al (2000) used a new data set on private savings in emerging economies, and estimated that the coefficient of the current account deficit was –0.33 and highly significant. These results, then, suggest that a decline in foreign savings – that is a lower current account deficit – will reduce aggregate savings and, thus, aggregate investment. Since there is ample evidence supporting the idea that investment has a positive effect on growth, the previous argument would suggest that, in contrast with Milesi-Ferreti and Razin's (2000) claim, current account reversals will have a negative – albeit indirect -- effect on growth. In order to test this hypothesis I estimated a number of investment equations using panel data for a large number of countries for the period 1970-1997. Following the recent empirical literature on investment equations I estimated equations of the following type:[22]

$$(10) \quad INVGDP_{tj} = \beta\, INVGDP_{t-1\ j} + \delta\, GOVCONS_{tj} + \phi\, OPENNESS_{tj} + \eta\, LOGGDPIN_{j} + \gamma\, REVERSAL_{tj} + \omega_{tj}.$$

Where INVGDP is the investment to GDP ratio, GOVCONS is the ratio of government expenditure to GDP, and OPENNESS is an index that captures the degree of openness of the economy. LOGGDPIN is the natural logarithm of initial (1970) GDP per capita. And REVERSAL is a variable that takes the value of one if the country in question has been subject to a current account reversal, and zero otherwise. Finally, ω is an error term, which is assumed to be heteroscedastic across panels.[23] In a recent study Attanasio et al

[22] On recent attempts to estimate investment equations using a cross section of countries see, for example, Barro and Sala-I-Marti (1995), and Attanasio et al (2000).

[23] Notice that the presence of a lagged dependsent variable poses somer problems for the estimation of (10). For instance, it is well known from eartly work by Balassa (1971) that if the error term contains a country specific term , the coefficient of the lagged dependent variable will be biased upward. There are several ways of handling that potential problem. One is using a fixed-effect model, wherew a country dummy (hopefully) picks up the effect of the country specific disturbance. A second way is to estimate, as in this paper a GLS method. This is indeed what Nerlove (1971) suggests. A third, and more elegant way of dealing with this problem is to use the procedure recently proposed by Arellano and Bond (1995).

(2000) have found that investment exhibits a considerable degree of persistence, and have argue that investment equations should include a lagged dependent variable as a regressor. The estimated β coefficient will capture the actual degree of persistence, with a value closer to one implying greater persistence. As Barro and Sala-I-Martin (1995) have pointed out, the coefficient of GOVCONS is expected to be negative, while that of openness is expected to be positive. If there is a catching-up effect in investment, as there is in growth, we would expect that the estimated coefficient of the logarithm of 1970 GDP per capita will be negative. The main interest of this analysis is the coefficient of REVERSAL. If sharp and large reductions in the current account deficit have a negative effect on investment, we would expect the estimated γ to be significantly negative. As pointed out, the error ω_{tj} is assumed to be heteroscedastic. Thus assuming k panels (countries):

$$(11) \qquad E[\,\boldsymbol{\omega}\,\boldsymbol{\omega}'\,] = \begin{pmatrix} \sigma^2_1\,\mathbf{I} & 0 & \dots & 0 \\ 0 & \sigma^2_2\,\mathbf{I} & \dots & 0 \\ . & . & . & . \\ . & . & . & . \\ 0 & 0 & \dots & \sigma^2_k\,\mathbf{I} \end{pmatrix}$$

Equation (10) was estimated using the feasible generalized least squares procedure (FGLS) suggested by Beck and Katz (1995) for unbalanced panels. The samples in the different estimations were determined by the availability of data on the different regressors. The data were obtained from the World Bank and from the Summer and Hestons data set. In the base estimates I used the definition of current account reversals given by *Reversal1* above. The basic results obtained from the estimation of equation (10) are presented in Table 10. As may be seen from the Table, the results obtained support the hypothesis that current account reversals have had a negative effect on the investment ratio. Moreover, the coefficients for the other variables in the regression have the expected signs, and are significant at conventional levels. A particularly interesting aspect of the results in Table 10 is that the coefficient of lagged investment is rather high, indicating that, as has been pointed out by Attanasio et al (2000) among others, the investment ratio exhibits a considerable degree of inertia. In order to investigate whether

reversals have a sustained negative effect on investment, I estimated equation 10 including REVERSAL with a one- and two-lags. The results are in Table 11 and indicate that current account reversal have had a negative effect on investment with up to a one year lag. Notice that the coefficient of two-year lagged REVERSAL is not significant at conventional levels. In order to check for the robustness of these results I also estimated equation (10) using alternative samples and definitions of current account reversals. The results obtained provide a strong support to those resulted here, and indicate that indeed current account reversals have affected economic performance negatively through the investment channel. An important question is whether the compression in investment is a result of private or public sector behavior. An analysis undertaken on a smaller (44 countries) sample suggests, although both private and public sector investment are negatively affected by current account reversals, the impact is significantly higher on private investment. According to these estimates, available from the author, a current account reversals results in a decline in private investment equal to 1,8% of GDP; the long term reduction of public sector investment is estimated to be, on average, 0.5% of GDP. An implication of this analysis is that the actual effect of current account reversals on GDP growth will be manifested with a lag. The reason for this is that changes in the capital stock will not impact actual growth instantaneously.

V. Current Account Deficits and Financial Crises: How Strong is the Link?

As was pointed out in section II of this paper, a large number of recent empirical studies have been unable to find a strong and significant connection between large current account deficits and financial crisis (Frankel and Rose, 1996). And yet, the policy literature – both from investment banks and from the multilateral institutions -- insists on arguing that large deficits have been at the center of recent crises. In this section I address this issue by analyzing in some detail the evidence on financial crises in a large cross section of countries. The section is organized as follows: In subsection V.1 I deal with the definition of crisis. In section V.2 I provide some preliminary evidence on the connection between current account reversals and crises, as well as between high current account deficits and crises. In this analysis I use statistical methods borrowed from the epidemiology literature. Finally, in subsection V.3 I provide some empirical

results, obtained using econometric techniques, on the relationship between large current account deficits and financial crises. I argue that whether one finds a connection depends largely on three factors: (1) the definition of crisis; (2) the sample considered; and (3) the lag structure used in the analysis.

V.1 Defining a Crisis

Paul Krugman has recently said that "there is no generally accepted formal definition of a currency crisis, but we know them when we see them. (Krugman 2000, p. 1)." While some authors, including myself in Edwards (1989) and Edwards and Santaella (1993), have defined a currency crisis as a very significant depreciation of the currency – see also Frankel and Rose, 1986; Milesi-Ferreti and Razin, 2000 --, others have defined a crisis as a situation where a country's currency is depreciated and/or its international reserves are seriously depleted (Eichengreen and Wyplosz 1996, Giolstein et al. 2000). In this paper, and in order to cast a very wide net in the empirical analysis, I have used two alternative criteria for defining crises.

The first definition follows Frankel and Rose (1996), and defines a currency crisis as a situation where there is a currency depreciation of at least 25%, that is also a 10% increase in the rate of depreciation. I call this variable ***aevent***.[24]

The second definition is broader, and includes as crises situations where the country in question has experienced a large depreciation, or has experienced a significant loss in reserves. In constructing this variable – which I call ***acrisis*** – I followed a four steps procedure:

(1) I created a weighted average index of monthly rate of change of the exchange rate ($\Delta e / e$), and of reserves ($\Delta R / R$), such as both components of the index have equal sample volatility: $I_t = \Delta e / e - (\sigma_e / \sigma_R) * (\Delta R / R)$.

(2) I define a crisis (C_t) to have taken place when the index exceed the mean of the index plus 3 standard deviations:

$$C_t = \begin{cases} 1 & if \quad I_t >= mean(I_t) + 3\sigma_I \\ 0 & otherwise \end{cases}$$

(3) I annualized the crisis index, by considering each year as a June-June period. In other words, a year "t" is assigned a crisis (=1), if any month between June of year "t" and June of year "t+1" is a crisis.

As Milesi-Ferreeti and Razin (2000) have pointed out, results from crisis analyses may be affected by the treatment of currency upheaval in consecutive years. In order to address this issue, I defined two additional crisis indicators that exclude adjacent "crises." These indicators, then consider a three-year window after each crisis: ***aevent2*** is the three-year window corresponding to ***aevent***, and ***acrisis2*** is the corresponding indicator for ***acrisis***.

According to these indicators, how frequent have currency crises been? This is addressed in Table 12, where I present tabulations for the four indexes for the complete sample. As may be seen, the frequency of "crises" goes from 4% to 11% of the country-year observations. In terms of the distribution across regions, according to both ***aevent*** indicators crises have had a higher frequency in Eastern Europe; the lowest frequency is in the industrialized nations, with no crises recorded. The ***acrisis*** records a frequency at approximately 10% in Latin America, Asia and Africa; the ***acrisis2*** index shows that the higher frequency of crises has been in Africa.

VI.2 Current Account Reversals and Crises: A Preliminary Analysis

Are current account reversals related to currency crises? In order to address this issue I followed a *case-control* methodology that is popular among epidemiologists.[25] This approach allows us to formally test – using a χ^2 statistic -- whether there is a significant relationship between a particular outcome (the case) and another variable to which both case and control variables have been "exposed." The first step in applying this approach, then, is to separate observations into a "case group" and a "control group." Countries that for a given year experienced a "crisis" are considered to be a "case." Non crisis observations constitute the "control group." The second step consists of calculating how many observations in both the case and control groups have been subject to a current

---

[24] The index was constructed on monthly data. In order to annualize it I consider June to June years.

[25] I became interested in statistical techniques used by epidemiologists in doing research on crisis contagion across countries. See Edwards (2000). See Fleiss (1991) for details on the actual method.

account reversal. From this information an odds ratio is computed, and a χ^2 test to estimate whether the odds ratio is significantly different from 1. If this null hypothesis cannot be rejected, then there is evidence supporting the hypothesis that countries that are subject to a reversal, have a significant probability of experiencing a crisis.

A straightforward application of this methodology – that is, a computation of the χ^2 test statistic using contemporaneous values of crisis and reversals --, result in the rejection of the null hypothesis that reversal countries are associated with a crisis. This result holds for all four definitions of crisis. The p-values of the χ^2 tests are in the order of 0.6, or higher. A possible limitation of this test, however, is that from a theoretical point of view the relationship between reversals and crisis implies complex timing and causality issues. In fact, there are valid reasons to believe that reversals may occur at the same time, before or after a "crisis." Indeed, the reversal may be so pronounced that the country in question has no alternative but to devalue its currency and/or deplete its international reserves. This phenomenon, however, needs not be contemporaneous. Also, the reversal may be the result, rather than the cause, of a devaluation. For this reason, I also asked whether there is statistical evidence that there is a current account reversal in the "neighborhood" of a crisis. In order to do this I define a new variable ***reversaln***, that takes a value of one on the year a reversal was detected, as well as in the previous and next year. The results from this second test suggest that it is not possible to reject the null hypothesis that currency crises occur "in the neighborhood of current account reversals." This is the case for any of the four crises definitions used in this study. In Table 13 I present, as an illustration, the results obtained from this analysis when the ***aevent*** definition of crisis was considered as the "case." In panel A I used the narrow one year definition of reversal, while in panel 2 the broader 3 year neighborhood definition of reversal is used. As may be seen, while in Panel A the χ^2 test is not significant, in Panel B it is highly significant – the p-value is 0.009.[26] Results obtained for the other three definitions of crisis are very similar and are available from the author on request.

V.3 Do High Current Account Deficits Help Predict Crises?

In a recent and influential paper, Frankel and Rose (1996) empirically analyzed the determinants of currency crises. Their data set included 105 countries for the period 1970-1991, and their definition of crisis was confined to devaluations in excess of 25%.[27] The results from their probit regression analysis indicated that a number of variables were good predictors of a currency crash. These included the fraction of the debt obtained in concessional terms, the FDI to GDP ratio, the reserves to imports ratio, the rate of growth of domestic credit, the country's rate of growth, and international interest rates. In terms of the present paper, what is particularly interesting is that in Frankel and Rose (1996) the current account deficit was not significant, and in many of the regressions had the wrong sign. This led the authors to conclude in that, "curiously, neither current account nor government budget deficits appear to play an important role in a typical crash." (page 365).[28]

My own initial analysis of the determinants of crises supports the results reported by Frankel and Rose (1996).[29] When a broad sample and their regressors are used, the current account seems to play no role in major currency crashes.[30] This is the case independently of the estimation technique used, or on whether the actual value of the current account deficit or a dummy for high deficits is included as an independent variable. To my surprise, the incorporation of an independent variable that interacted the fiscal and current account deficits (the "twin" deficits) did not change the result. In order to investigate this issue further I followed three avenues of analysis: First, I inquired whether the results would hold under alternative data sets. In particular, I investigated if the exclusion of particular regions would alter the results. Second, I considered alternative sets of independent variables in the estimation of probit equations for crises. In particular I considered alternative lag structures, and I included some variables that capture the economic structure of the countries in the sample. And third, I considered

---

[26] These results, however, should be interpreted with caution, as they are subject to all the limitation of thus type of case-control analysis, including the fact that no causality can be established. In this case, however, I am not particularly interested in causation.

[27] See subsection V.1 for a discussion of their definition.

[28] This finding is not affected by any of the sensitivity tests undertaken by the authors.

[29] In this paper I also report some of the results obtained in this research project. Detailed results are available on request.

[30] By broad sample I mean one that includes all regions in the world.

alternative definitions of "crisis." More specifically, I estimated a number of probit equations for all four definitions of crisis described in subsection V.1 of this paper: ***aevent***, ***aevent2***, ***acrisis***, and ***acrisis2***.

In the estimation of probit models of crisis I used the following regressors:[31] (1) Percentage of debt in commercial terms; (2) percentage of debt in concessional terms; (3) percentage of debt at variable rate; (4) percentage of short term debt; (5) FDI; (6) public sector debt as percentage of GDP; (7) debt to the multilateral institutions; (8) the ratio of (gross) international reserves to imports; (9) foreign debt to GDP; (10) the rate of growth of domestic credit: (11) deviations of the real exchange rate from PPP (a measure of "overvaluation"; (12) the rate of growth of GDP; (13) the degree of openness of the economy, measured as imports plus exports over GDP (from Summer and Heston); (14) the ration of government expenditure to GDP; (15) interest rates in the advanced countries; and (16) the current account deficit. With the exception of openness and government expenditure – which were obtained from Summer and Heston – all the variables are from the world Bank. In the current version of the paper the data cover the 1971-1992 period.

In reporting the regressions, I follow the tradition of presenting the effects of a unitary change in the independent variables on the probability of a crisis. The results obtained when all variables are entered contemporaneously, and all regions are included are presented in Table 14. The results are quite interesting and, to a large extent, in agreement with expectations. They suggest that higher reserves and higher growth reduce the probability of both types of crisis. Large FDI plays a particularly important role in reducing the probability of an ***event*** type of crisis. A high percentage of debt in commercial terms increases the probability of both types of crisis. While a greater degree of openness reduces the probability of both crisis, a larger government expenditure to GDP ratio increases it. The most interesting result, for the purposes of this paper, is that the current account deficit enters with the expected sign – positive, suggesting that a larger deficits increase the probability of a crisis. Only in one of the regressions, however, is its coefficient significant at the 10 percent level.

---

[31] Most, but not all, of these regressors were used by Frankel and Rose (1996). The results reported here are not directly comparable to Frankel and Rose (1996), since the data sets are somewhat different.

In order to analyze the robustness of these results I investigated whether they held under different sample selection and different lag structures for the regressors. I particular I considered the following structure: all debt variables were entered contemporaneously, as were the structural variables; the country performance and policy variables were entered with a one period lag. The results obtained are presented in Table 13. As may be seen from these results, when this alternative lag structure is used, the coefficient of the current account deficit remains positive and becomes significant. When every regressor is entered with one lag, the coefficient of the current account deficit remains positive and significant. In that case, however, some of the debt variables became non significant. Overall, the results reported in Tables 12 and 13 suggest that current account deficits convey (some) information on the probability of a crisis. This seems to be the case for all definitions of crisis.

As a final exercise I estimated these probit regressions excluding the African countries. This for two reasons: first, during the complete period under analysis a large number of African nations belonged to the CFA currency zone, and were institutionally shielded from devaluations. Second, it is well known that during most of this period even non CFA African nations had a great reluctance to adjust their parity. This even if the external imbalance was very large (World Bank 1994). When these nations are excluded from the sample the results reported above in terms of the role of the current account on crises becomes reinforced

TABLE 1
External world's Desired Holdings of a Country's Liabilities (% of GDP)

Country	*Desired Holding*	*Country*	**Desired Holding**
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 2
Sustainable Current Account Deficit (SCAD) (% of GDP)

	1997 CAD	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 3

Number of Observations per Region Used In Current Account Analysis

year	Industri	LatinAme	Asia	Africa	MiddleEa	EastEur	Total
1970	8	5	5	2	2	0	22
1971	9	6	5	2	3	0	25
1972	10	6	6	2	3	0	27
1973	10	6	6	2	3	0	27
1974	11	7	7	10	4	1	40
1975	18	10	9	18	5	1	61
1976	20	17	10	23	8	1	79
1977	22	25	11	32	9	1	100
1978	22	27	11	36	9	1	106
1979	21	29	12	37	9	1	109
1980	21	32	13	40	10	3	119
1981	22	32	15	41	10	3	123
1982	22	32	15	42	10	4	125
1983	22	32	15	42	10	4	125
1984	22	33	17	42	10	5	129
1985	22	33	17	44	10	5	131
1986	22	31	17	45	10	5	130
1987	22	32	17	47	10	6	134
1988	22	32	17	47	10	6	134
1989	22	32	17	47	10	6	134
1990	22	32	17	46	11	6	134
1991	23	32	17	45	10	7	134
1992	23	33	18	44	10	13	141
1993	23	33	18	44	10	18	146
1994	23	33	18	44	11	20	149
1995	23	31	18	36	11	20	139
1996	23	26	18	28	7	21	123
1997	20	17	18	22	7	19	103
Total	550	696	384	910	232	177	2,949

Source: Computed by the author.

TABLE 4
Average Current Account to GDP Deficit Ratios
By Region: 1970-1997*

year	Industri	LatinAme	Asia	Africa	MiddleEa	EastEur	Total
1970	-0.02	7.59	-0.52	0.92	7.86		2.40
1971	-0.28	5.59	0.08	5.25	-0.13		1.66
1972	-1.54	3.86	1.80	6.16	-4.39		0.66
1973	-1.18	3.40	0.53	7.18	0.61		1.04
1974	3.00	3.30	3.55	-3.22	-10.14	1.50	0.24
1975	1.49	2.44	2.02	4.72	-9.52	3.52	1.81
1976	2.20	1.42	0.81	5.70	-10.59	3.81	1.60
1977	1.86	4.09	0.90	3.77	-5.88	5.15	2.26
1978	0.52	3.39	2.82	8.62	0.77	1.88	4.28
1979	1.43	4.28	3.54	6.51	-8.18	1.54	3.35
1980	2.22	7.13	9.40	7.12	-9.02	2.06	5.02
1981	2.47	10.15	10.15	10.68	-8.00	3.17	7.30
1982	2.41	9.09	9.94	12.38	-1.67	1.46	8.02
1983	1.24	6.39	9.52	8.76	1.61	1.47	6.11
1984	0.99	4.16	5.83	6.19	1.32	0.40	4.14
1985	1.17	2.72	4.67	6.44	1.45	1.54	3.82
1986	0.98	5.44	3.60	6.60	1.30	2.80	4.43
1987	1.04	5.37	2.24	4.75	1.25	0.17	3.51
1988	0.91	4.28	1.65	5.80	0.54	-1.05	3.41
1989	1.20	5.28	2.85	4.64	-2.99	0.33	3.24
1990	1.18	4.59	2.31	4.51	-4.73	2.96	2.88
1991	0.68	7.19	2.56	4.79	n.a.	1.78	6.26
1992	0.44	5.47	2.33	6.31	7.90	-0.14	4.17
1993	-0.45	5.89	5.10	6.75	5.64	1.26	4.46
1994	-0.35	4.65	3.38	6.47	-0.31	0.91	3.39
1995	-0.32	4.43	5.07	8.00	-1.63	2.59	3.91
1996	-0.44	5.29	4.33	8.51	-2.60	6.45	4.56
1997	-0.66	3.87	3.79	4.57	-3.89	6.51	3.09
Total	0.87	5.28	4.12	6.56	-0.40	2.52	4.09

* A positive number denotes a current account deficit. A negative number is a surplus.

Source: Computed by the author from raw data obtained from the World Bank.

TABLE 5
Median Current Account to GDP Deficit Ratios
By Region: 1970-1997

year	Industri	LatinAme	Asia	Africa	MiddleEa	EastEur	Total
1970	-0.41	4.06	0.94	0.92	7.86		0.86
1971	-0.51	4.83	1.10	5.25	5.74		1.08
1972	-1.06	1.70	1.57	6.16	2.88		0.44
1973	0.18	1.24	0.77	7.18	5.42		0.95
1974	2.94	4.10	3.02	2.39	0.14	1.50	2.97
1975	1.34	4.52	3.23	6.56	-2.73	3.52	3.40
1976	2.71	1.41	0.62	5.00	-6.65	3.81	3.27
1977	2.11	3.80	-0.03	4.24	-3.71	5.15	2.84
1978	0.68	3.48	2.74	9.95	3.01	1.88	3.60
1979	0.66	4.68	3.73	6.52	-8.89	1.54	3.32
1980	2.35	5.59	5.03	8.36	-3.96	4.95	4.66
1981	2.73	9.06	5.92	10.09	1.46	2.72	6.58
1982	2.02	7.60	5.10	9.85	-1.53	1.88	6.41
1983	0.88	4.70	7.18	6.59	5.10	1.48	4.33
1984	0.22	3.66	2.12	3.76	4.89	1.43	2.51
1985	0.98	2.07	3.13	4.42	2.61	1.51	2.91
1986	-0.12	2.99	2.42	3.76	2.30	1.93	2.68
1987	0.42	4.15	1.34	5.22	3.04	0.76	2.61
1988	1.15	2.25	2.68	5.50	2.00	0.72	2.66
1989	1.54	4.41	3.35	3.76	-0.39	1.70	2.85
1990	1.60	3.00	3.41	3.78	-0.58	3.69	2.83
1991	0.91	4.83	3.17	3.64	9.74	0.70	3.02
1992	0.86	4.34	1.94	5.65	7.29	0.40	3.01
1993	0.55	4.60	4.18	6.81	4.20	1.58	3.18
1994	-0.37	3.19	4.63	5.65	-0.38	1.39	2.49
1995	-0.71	3.90	4.91	4.81	-2.14	1.99	2.70
1996	-0.56	3.97	4.76	4.15	-0.99	4.50	3.28
1997	-0.57	4.12	3.61	3.71	-2.39	6.29	2.94
Total	0.77	4.12	3.14	5.33	1.95	1.93	3.17

Source: Computed by the author from raw data obtained from the World Bank

TABLE 6
Third Quartile of Current Account to GDP Deficit Ratios
By Region: 1970-1997

year	group1 Industri	LatinAme	Asia	Africa	MiddleEa	EastEur	Total
1970	0.64	6.86	1.28	1.93	9.85		4.06
1971	0.43	7.77	1.74	8.28	9.31		4.55
1972	0.30	2.37	3.63	11.96	5.30		2.59
1973	1.33	4.12	1.30	9.99	5.81		4.12
1974	4.41	10.05	5.61	4.64	14.44	1.50	5.52
1975	4.46	6.78	5.06	8.44	13.98	3.52	7.75
1976	4.38	4.23	6.19	8.80	4.36	3.81	5.47
1977	3.62	7.37	4.49	7.86	2.47	5.15	6.35
1978	2.50	7.07	4.80	12.85	9.17	1.88	9.17
1979	2.76	6.60	6.57	12.30	5.17	1.54	7.62
1980	3.70	12.92	8.46	13.11	2.63	5.99	10.60
1981	4.32	15.06	10.04	12.85	5.85	7.38	11.76
1982	4.05	11.74	11.49	14.48	8.26	2.63	10.57
1983	2.41	8.33	9.01	12.39	7.73	2.61	8.33
1984	3.08	6.56	4.88	8.78	8.17	1.46	5.69
1985	3.75	6.05	4.82	9.68	7.45	1.85	6.42
1986	3.51	7.75	5.16	8.19	9.36	4.69	6.44
1987	3.24	8.79	4.07	9.69	6.35	2.53	6.35
1988	3.03	7.67	4.30	9.49	4.65	1.75	6.51
1989	3.60	7.61	5.91	7.02	5.43	2.02	5.69
1990	3.37	7.64	6.08	8.93	2.77	8.25	6.13
1991	2.78	11.57	6.61	9.05	17.96	3.51	7.57
1992	2.67	8.04	4.70	9.01	15.72	3.68	6.86
1993	1.65	8.81	6.42	8.80	11.45	4.45	7.86
1994	1.83	7.27	6.46	8.88	6.62	3.57	6.50
1995	1.64	5.42	8.06	10.42	4.24	5.54	6.61
1996	1.83	7.02	8.10	9.25	3.32	9.16	7.60
1997	1.91	5.93	6.89	7.05	2.94	11.07	6.29
1998							
Total	3.06	8.16	6.37	10.09	7.14	4.84	7.22

Source: Computed by the author from raw data obtained from the World Bank.

TABLE 7

Countries with Persistently High Current Account Deficits:
By Region, 1975-1997*

A. Industrialized Countries

I. Australia	**1981-1997**
Canada	1989-1994
Greece	1979-1985
Ireland	1976-1985
Malta	1993-1997
New Zealand	1975-1988 & 1993-1997

B. Latin America and the Caribbean

II. Grenada	**1986-1996**
Guyana	1979-1985
Honduras	1975-1979
Nicaragua	1980-1990

C. Asia

III. Bhutan	**1981-1997**
Lao	1980-1990
Malvides	1980-1985
Nepal	1985-1997
Vietnam	1993-1997

D. Africa

IV. Congo	**1990-1997**
Cote D'Ivoire	1980-1992
Equatorial Guinea	1987-1991
Guinea-Bissau	1982-1994
Mali	1984-1989
Mauritania	1975-1988
Mozambique	1986-1996
Sao Tome	1981-1990
Somalia	1982-1987
Sudan	1990-1997
Swaziland	1978-1985
Tanzania	1990-1997

TABLE 7 (continuation)

E. Middle East

V.	**Cyprus**	**1977-1981**

F. Eastern Europe

None

---

* The countries in this list have had a *"high current account deficit"* for at least five years in a row. See the text for the exact definition of *"high current account deficit."*

Source: Computed by the author.

TABLE 8
Current Account Reversals:
Tabulations by Region 1970-1997*

A. Industrialized

	Freq.	Percent	Cum.
0	451	93.96	93.96
1	29	6.04	100.00
Total	480	100.00	

B. Latin America

	Freq.	Percent	Cum.
0	359	81.04	81.04
1	84	18.96	100.00
Total	443	100.00	

C. Asia

	Freq.	Percent	Cum.
0	250	85.91	85.91
1	41	14.09	100.00
Total	291	100.00	

D. Africa

	Freq.	Percent	Cum.
0	230	72.56	72.56
1	87	27.44	100.00
Total	317	100.00	

E. Middle East

	Freq.	Percent	Cum.
0	156	74.29	74.29
1	54	25.71	100.00
Total	210	100.00	

F. Eastern Europe

	Freq.	Percent	Cum.
0	134	85.90	85.90
1	22	14.10	100.00
Total	156	100.00	

All Countries

	Freq.	Percent	Cum.
0	1580	83.29	83.29
1	317	16.71	100.00
Total	1897	100.00	

.

*Reversals are defined as a reduction in the deficit of at least 3% of GDP in one year. A number 1 captures reversals. The data set has been restricted to countries with population in excess of half a million people, and GDP per capita over $500 at PPP value.

Source: Calculated by the author

TABLE 9
Current Account Reversals and Medium-Term Improvement

A. Industrial

cad improvement in a 3 year period, forward	reversal in 1 yr greater 3% 0	1	Total
0	128	5	133
1	156	12	168
Total	284	17	301

b. Latin America

cad improvement in a 3 year period, forward	reversal in 1 yr greater 3% 0	1	Total
0	156	33	189
1	174	19	193
Total	330	52	382

C. Asia

cad improvement in a 3 year period, forward	reversal in 1 yr greater 3% 0	1	Total
0	137	18	155
1	116	13	129
Total	253	31	284

D. Africa

cad improvemen t in a 3 year period, forward	reversal in 1 yr greater 3% 0	1	Total
0	211	72	283
1	231	61	292
Total	442	133	575

E. Middle East

cad improvemen t in a 3 year period, forward	reversal in 1 yr greater 3% 0	1	Total
0	45	11	56
1	62	8	70
Total	107	19	126

F. Eastern Europe

cad improvemen t in a 3 year period, forward	reversal in 1 yr greater 3% 0	1	Total
0	67	6	73
1	36	6	42
Total	103	12	115

Source: Calculated by the author.

TABLE 10

Investment and Current Account Reversals: Feasible General Least Squares

Panel A. Openness Excluded (117 Countries Sample)

```
Coefficients:  generalized least squares
Panels:        heteroscedastic

Estimated covariances      =       117          Number of obs      =      2098
Estimated autocorrelations =         0          Number of groups   =       117
Estimated coefficients     =         5          Obs per group: min =         2
                                                               avg =  20.15825
                                                               max =        27
                                                Wald chi2(4)       =  18502.64
Log likelihood             =  -4563.66          Pr > chi2          =    0.0000

------------------------------------------------------------------------------
  invgdp |      Coef.   Std. Err.       z     P>|z|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
 invgdp1 |   .7459094   .0071959    131.451   0.000       .9318056    .9600132
  govcon |  -.0179916   .0076096     -2.364   0.018      -.0329061   -.0030771
 loggpp0 |  -.0947508    .040494     -2.340   0.019      -.1741177   -.0153839
     rev |  -1.686281   .1231934    -13.688   0.000      -1.927735   -1.444826
   _cons |   2.271841   .2892101      7.855   0.000       1.704999    2.838682
------------------------------------------------------------------------------
```

Panel B. Openness Included (62 Countries Sample)

```
Coefficients:  generalized least squares
Panels:        heteroscedastic

Estimated covariances      =        62          Number of obs      =      1044
Estimated autocorrelations =         0          Number of groups   =        62
Estimated coefficients     =         6          Obs per group: min =         3
                                                               avg =  17.78927
                                                               max =        22
                                                Wald chi2(5)       =   8871.53
Log likelihood             = -2067.496          Pr > chi2          =    0.0000

------------------------------------------------------------------------------
  invgdp |      Coef.   Std. Err.       z     P>|z|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
 invgdp1 |   .7316683   .0109454     85.120   0.000       .9102157    .9531209
  govcon |  -.0318622   .0105215     -3.028   0.002       -.052484   -.0112403
  opensh |   .0069603   .0014526      4.792   0.000       .0041133    .0098072
 loggpp0 |  -.1076795   .0577929     -1.863   0.062      -.2209515    .0055924
     rev |  -1.976731   .1673561    -11.812   0.000      -2.304743   -1.648719
   _cons |   2.594588   .4364334      5.945   0.000       1.739195    3.449982
------------------------------------------------------------------------------
```

Source: Estimated by the author. See text for details.

TABLE 11

Investment and Current Account Reversals: Several Lags (Feasible General Least Squares)

```
Coefficients:  generalized least squares
Panels:        heteroscedastic

Estimated covariances      =       113          Number of obs      =      1344
Estimated autocorrelations =         0          Number of groups   =       113
Estimated coefficients     =         7          Obs per group: min =         1
                                                                 avg =  14.90327
                                                                 max =        23
                                                Wald chi2(6)       =  23411.92
Log likelihood             = -2822.348          Pr > chi2          =    0.0000

------------------------------------------------------------------------------
  invgdp |      Coef.   Std. Err.       z     P>|z|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
 invgdp1 |   .7451615    .008058    117.295   0.000       .9293682    .9609548
  govcon |  -.0196429   .0090918     -2.161   0.031      -.0374624   -.0018233
 loggpp0 |  -.1186292   .0478984     -2.477   0.013      -.2125083     -.02475
     rev |   -1.86796   .1077986    -17.328   0.000      -2.079241   -1.656678
  revlag |  -.3801609   .1468229     -2.589   0.010      -.6679285   -.0923932
 revlag2 |  -.0981711   .1402574     -0.700   0.484      -.3730706    .1767284
   _cons |   2.549166   .3246099      7.853   0.000       1.912942     3.18539
------------------------------------------------------------------------------
```

Source: Estimated by the author. See text for details.

TABLE 12
Frequency of Crises: Alternative Indicators*

A: aevent

(mean) event	Freq.	Percent	Cum.
0	2818	94.09	94.09
1	177	5.91	100.00
Total	2995	100.00	

B. aevent2

aevent2	Freq.	Percent	Cum.
0	2318	95.79	95.79
1	102	4.21	100.00
Total	2420	100.00	

C. acrisis

(mean) crisis	Freq.	Percent	Cum.
0	2548	90.26	90.26
1	275	9.74	100.00
Total	2823	100.00	

D. acrisis2

acrisis2	Freq.	Percent	Cum.
0	1564	88.91	88.91
1	195	11.09	100.00
Total	1759	100.00	

*See the text for the exact definition of these indicators.

Source: Calculated by the author.

Table 13
Case-Control χ^2-test
Analysis of Crisis and Current Account Reversals

A. PANEL A

VI.
VII. Case: *Aevent* definition of crisis;
VIII. Exposed: *Reversal1* definition of current account reversal

	Exposed	Unexposed	Total	Proportion Exposed
Cases	28	124	152	0.1842
Controls	410	1793	2203	0.1861
Total	438	1917	2355	0.1860
	Point estimate		[95% Conf.	Interval]
Odds ratio (Cornfield)	.9874902		.6481554	1.504718
Prev. frac. ex. (Cornfield)	.0125098		-.504718	.3518446
Prev. frac. pop	.0023282			

chi2(1) = 0.00 Pr>chi2 = 0.9536

B. PANEL B

IX. Case: *Aevent* definition of crisis;
X. Exposed: *Reversaln1* definition of current account reversal

	Exposed	Unexposed	Total	Proportion Exposed
Cases	52	35	87	0.5977
Controls	563	679	1242	0.4533
Total	615	714	1329	0.4628
	Point estimate		[95% Conf.	Interval]
Odds ratio (Cornfield)	1.791829		1.15408	2.781784
Attr. frac. ex. (Cornfield)	.4419112		.1335086	.6405185
Attr. frac. pop	.2641308			

chi2(1) = 6.82 Pr>chi2 = 0.0090

Source: Computed by the author

TABLE 12
Probit Estimates of Crisis: Alternative Definitions

A. acrisis definition

Probit estimates — Number of obs = 523

LR chi2(17) = 62.42

Prob > chi2 = 0.0000

Log likelihood = -155.12054 — Pseudo R2 = 0.1675

acrisis	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0053264	.002025	2.56	0.010	27.6574	.001357	.009295
conrat	-.0013186	.0011752	-1.11	0.268	23.3448	-.003622	.000985
varrat	-.0042664	.0018918	-2.18	0.029	29.4032	-.007974	-.000559
fdistock	-.0075051	.0032982	-2.02	0.044	2.75867	-.013969	-.001041
shorttot	.0021687	.0020892	1.04	0.297	15.7348	-.001926	.006264
pubrat	.0025256	.0013513	1.86	0.063	70.0063	-.000123	.005174
multirat	.0027581	.001675	1.65	0.099	15.7147	-.000525	.006041
debty	.0005857	.000371	1.58	0.114	55.1118	-.000141	.001313
reservem	-.0000983	.0000469	-2.07	0.038	388.214	-.00019	-6.5e-06
defrat	.0017159	.0024085	0.72	0.473	4.87904	-.003005	.006436
dlcred	.000484	.0002953	1.75	0.080	27.4945	-.000095	.001063
dly	-.0025653	.0019943	-1.29	0.197	3.96917	-.006474	.001343
istar	.003181	.0041744	0.76	0.446	8.50171	-.005001	.011363
overvaln	.0000194	.0005176	0.04	0.970	-6.7892	-.000995	.001034
opensh	-.0016087	.00062	-2.42	0.015	57.2413	-.002824	-.000394
govcon	.0005609	.0031709	0.18	0.860	12.9706	-.005654	.006776
cad	.0044749	.002701	1.61	0.107	3.7333	-.000819	.009769
obs. P	.1147228						
pred. P	.067235	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0

B. acrisis2 definition

Probit estimates — Number of obs = 303; LR chi2(17) = 59.50; Prob > chi2 = 0.0000; Log likelihood = -88.47807; Pseudo R2 = 0.2516

acrisis2	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.006692	.0027318	2.40	0.016	26.2124	.001338	.012046
conrat	-.0034281	.0015524	-2.21	0.027	25.8394	-.006471	-.000385
varrat	-.0081713	.0027453	-2.93	0.003	28.3514	-.013552	-.002791
fdistock	-.0030593	.0034497	-0.84	0.402	3.43481	-.00982	.003702
shorttot	-.00007	.0027994	-0.03	0.980	15.8763	-.005557	.005417
pubrat	.0007515	.0017319	0.43	0.667	69.3736	-.002643	.004146
multirat	.0033964	.0021136	1.60	0.110	16.0941	-.000746	.007539
debty	.0007172	.0005419	1.34	0.180	48.1361	-.000345	.001779
reservem	-.0001198	.0000637	-1.88	0.060	404.129	-.000245	5.1e-06
defrat	-.0034987	.0035452	-0.99	0.324	4.32381	-.010447	.00345
dlcred	.0007554	.0005727	1.41	0.158	23.3754	-.000367	.001878
dly	-.0059806	.0031767	-1.94	0.052	4.94562	-.012207	.000246
istar	.0044094	.0054013	0.82	0.412	8.189	-.006177	.014996
overvaln	.0007416	.0007039	1.05	0.295	-5.40918	-.000638	.002121
opensh	-.0025367	.0008413	-2.89	0.004	58.5394	-.004186	-.000888
govcon	.0109418	.0046006	2.54	0.011	12.5518	.001925	.019959
cad	.0051826	.0037278	1.37	0.170	3.02324	-.002124	.012489
obs. P	.1320132						
pred. P	.0631756	(at x-bar)					

C. aevent definition

Probit estimates — Number of obs = 524; LR chi2(17) = 64.24; Prob > chi2 = 0.0000; Log likelihood = -118.98083; Pseudo R2 = 0.2126

aevent	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0032815	.0014877	2.22	0.027	27.6054	.000366	.006197
conrat	.0000203	.0008434	0.02	0.981	23.4337	-.001633	.001673
varrat	-.0016771	.001377	-1.20	0.232	29.3478	-.004376	.001022
fdistock	-.0058847	.0023419	-2.06	0.039	2.75367	-.010475	-.001295
shorttot	.0032785	.0016088	2.16	0.031	15.7109	.000125	.006432
pubrat	.0022183	.0010488	2.17	0.030	70.0459	.000163	.004274
multirat	.0015928	.0012594	1.29	0.198	15.716	-.000875	.004061
debty	.0003531	.0002701	1.32	0.188	55.1459	-.000176	.000882
reservem	-.0000639	.000033	-1.96	0.050	388.607	-.000128	7.4e-07
defrat	.0024475	.0018165	1.40	0.162	4.88289	-.001113	.006008
dlcred	.0003058	.0002205	1.58	0.115	27.4581	-.000126	.000738
dly	-.0016435	.0014327	-1.16	0.248	3.97183	-.004452	.001165
istar	.0002737	.0029887	0.09	0.927	8.49993	-.005584	.006132
overvaln	-.0002295	.0003954	-0.59	0.554	-6.67278	-.001005	.000546
opensh	-.000962	.0004434	-1.99	0.047	57.1885	-.001831	-.000093
govcon	-.0039242	.0024103	-1.67	0.095	12.9679	-.008648	.0008
cad	.0028743	.0019208	1.44	0.149	3.72866	-.00089	.006639
obs. P	.0839695						
pred. P	.0373201	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0

D. aevent2 definition

Probit estimates — Number of obs = 363
LR chi2(17) = 35.11
Prob > chi2 = 0.0060
Log likelihood = -78.577039 — Pseudo R2 = 0.1826

aevent2	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0027626	.0018059	1.54	0.124	25.8559	-.000777	.006302
conrat	-.0003299	.0009605	-0.34	0.733	25.7629	-.002213	.001553
varrat	-.0020191	.0017173	-1.16	0.245	27.2727	-.005385	.001347
fdistock	-.0030638	.0026379	-1.01	0.314	3.30312	-.008234	.002106
shorttot	.0024202	.0018803	1.36	0.174	15.6504	-.001265	.006106
pubrat	.0014154	.001189	1.22	0.224	69.9649	-.000915	.003746
multirat	.0004943	.0014515	0.34	0.733	16.4219	-.002351	.003339
debty	.000488	.0003489	1.43	0.152	49.1888	-.000196	.001172
reservem	-.0000829	.0000434	-2.01	0.045	392.657	-.000168	2.2e-06
defrat	.000396	.0021124	0.19	0.851	4.90965	-.003744	.004536
dlcred	.0003975	.0003729	1.20	0.231	22.6847	-.000333	.001128
dly	-.0028823	.0018938	-1.61	0.107	4.92387	-.006594	.000829
istar	.0010784	.0035838	0.30	0.763	8.34298	-.005946	.008103
overvaln	-.0000506	.0004434	-0.11	0.909	-6.40344	-.00092	.000819
opensh	-.0011661	.0005526	-1.96	0.050	59.3686	-.002249	-.000083
govcon	-.0017672	.0026411	-0.66	0.506	13.3561	-.006944	.003409
cad	.0007612	.002441	0.31	0.758	3.31854	-.004023	.005545
obs. P	.0743802						
pred. P	.0359241	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0

Table 13
Probit Estimates of Crisis
A. acrisis

Probit estimates — Number of obs = 443; LR chi2(16) = 49.32; Prob > chi2 = 0.0000; Log likelihood = -143.45971; Pseudo R2 = 0.1467

acrisis	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0067398	.0021446	2.99	0.003	28.1267	.002536	.010943
conrat	-.0010345	.0014483	-0.71	0.476	22.16	-.003873	.001804
varrat	-.0052604	.002104	-2.41	0.016	30.7223	-.009384	-.001137
fdistock	-.0056488	.0045057	-1.21	0.225	2.40992	-.01448	.003182
shorttot	.0029321	.0026866	1.09	0.276	15.6367	-.002334	.008198
pubrat	.0023035	.0016625	1.37	0.169	70.4918	-.000955	.005562
multirat	.0032262	.0018768	1.69	0.091	15.8271	-.000452	.006905
debty	.0007814	.0004489	1.75	0.081	56.9947	-.000098	.001661
reserve1	-.0000688	.0000493	-1.38	0.168	411.015	-.000165	.000028
defrat1	.00187	.002698	0.70	0.486	4.66874	-.003418	.007158
dlcred1	.0005658	.0003187	1.78	0.076	27.3848	-.000059	.001191
dly1	-.0007804	.0023277	-0.34	0.737	4.24879	-.005343	.003782
istar1	.0004495	.00459	0.10	0.922	8.11989	-.008547	.009446
overval1	-.0003345	.000601	-0.56	0.576	-6.71219	-.001512	.000843
cadlag	.0066326	.0032781	1.96	0.050	3.50233	.000208	.013057
opensh	-.0026199	.0006898	-3.54	0.000	56.1613	-.003972	-.001268
obs. P	.1264108						
pred. P	.0817497	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0

XI. B. acrisis2

Probit estimates — Number of obs = 826; LR chi2(15) = 23.55; Prob > chi2 = 0.0732; Log likelihood = -278.89451; Pseudo R2 = 0.0405

acrisis	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0044355	.0018677	2.36	0.018	20.4821	.000775	.008096
conrat	-.000244	.0009296	-0.26	0.793	32.6123	-.002066	.001578
varrat	-.0031264	.0018317	-1.70	0.089	21.9749	-.006716	.000464
fdistock	-.0034602	.0022863	-1.50	0.133	2.77771	-.007941	.001021
shorttot	.0016639	.0017613	0.94	0.345	14.4349	-.001788	.005116
pubrat	.0009051	.0012773	0.71	0.479	73.3015	-.001598	.003409
multirat	.0008847	.0009758	0.91	0.365	22.3332	-.001028	.002797
debty	.0001146	.0002608	0.44	0.660	62.2386	-.000397	.000626
reserve1	.0000101	.0000399	0.25	0.800	342.294	-.000068	.000088
defrat1	.0005306	.001906	0.28	0.781	5.11639	-.003205	.004266
dlcred1	.0007842	.0003209	2.44	0.015	22.7418	.000155	.001413
dly1	-2.64e-06	.0018039	0.00	0.999	3.68699	-.003538	.003533
istar1	.0005185	.0037967	0.14	0.891	8.13081	-.006923	.00796
overval1	.0002948	.0004647	0.63	0.526	-7.39963	-.000616	.001206
cadlag	.0024454	.0017876	1.37	0.172	4.6108	-.001058	.005949
obs. P	.1125908						
pred. P	.1037697	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0

C. aevent

Probit estimates — Number of obs = 439
LR chi2(17) = 64.56
Prob > chi2 = 0.0000
Log likelihood = -112.83376 — Pseudo R2 = 0.2224

aevent	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.	]
comrat	.0026508	.0014201	1.84	0.066	27.9253	-.000133	.005434
conrat	-.000283	.0009184	-0.31	0.758	22.3614	-.002083	.001517
varrat	-.0015222	.0014263	-1.05	0.293	30.4172	-.004318	.001273
fdistock	-.0071803	.0030388	-2.07	0.038	2.42201	-.013136	-.001224
shorttot	.0021761	.0018209	1.21	0.225	15.6019	-.001393	.005745
pubrat	.0023019	.0012237	1.92	0.055	70.6993	-.000096	.0047
multirat	-.0005814	.0013425	-0.43	0.664	15.9503	-.003213	.00205
debty	.0002743	.0002938	0.94	0.345	56.9917	-.000302	.00085
reserve1	-.0000462	.0000323	-1.42	0.156	409.543	-.00011	.000017
defrat1	.0029015	.0019444	1.58	0.114	4.65606	-.000909	.006712
dlcred1	.000086	.0002273	0.39	0.700	26.8377	-.000359	.000531
dly1	-.0017313	.0015964	-1.08	0.280	4.30394	-.00486	.001398
istar1	.0000892	.0030285	0.03	0.977	8.12247	-.005847	.006025
overval1	-.0004955	.0004653	-1.12	0.264	-6.57233	-.001408	.000417
cadlag	.0046016	.0021704	2.02	0.043	3.50116	.000348	.008856
opensh	-.0016943	.000539	-3.07	0.002	56.5313	-.002751	-.000638
govcon	-.0070824	.0028355	-2.66	0.008	12.6914	-.01264	-.001525
obs. P	.1025057						
pred. P	.040207	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0

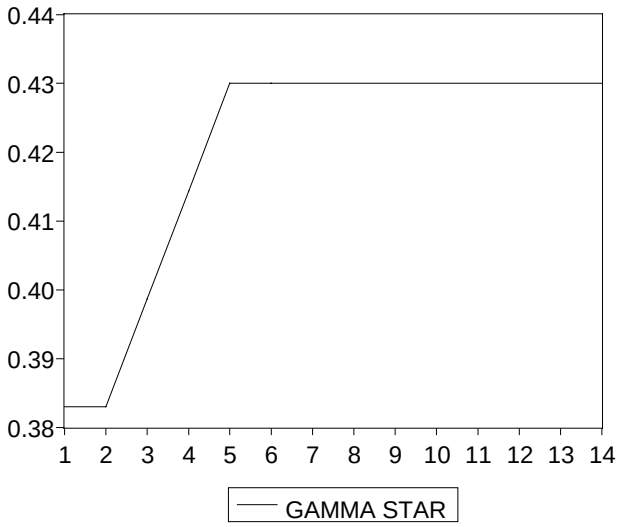
XII. D. aevent2

Probit estimates — Number of obs = 302
LR chi2(16) = 38.95
Prob > chi2 = 0.0011
Log likelihood = -66.747732 — Pseudo R2 = 0.2259

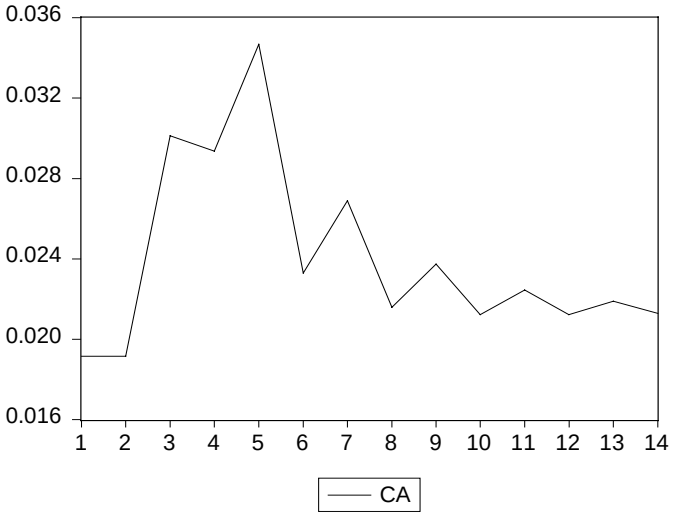
aevent2	dF/dx	Std. Err.	z	P>|z|	x-bar	[95% C.I.	]
comrat	.0015602	.0014213	1.15	0.252	26.452	-.001226	.004346
conrat	-.0004978	.0008415	-0.60	0.548	24.6148	-.002147	.001151
varrat	-.0011663	.0014507	-0.82	0.410	28.4819	-.00401	.001677
fdistock	-.0049362	.0025895	-1.65	0.099	2.87662	-.010012	.000139
shorttot	.0022585	.0017187	1.39	0.165	15.5656	-.00111	.005627
pubrat	.0014814	.0010793	1.46	0.145	70.5036	-.000634	.003597
multirat	-8.55e-07	.0012093	0.00	0.999	16.625	-.002371	.002369
debty	.000179	.0002761	0.67	0.505	50.7204	-.000362	.00072
reserve1	-.0000904	.0000403	-2.43	0.015	407.536	-.000169	-.000011
defrat1	.0003988	.0016118	0.25	0.804	4.65317	-.00276	.003558
dlcred1	.0002125	.0002241	1.03	0.301	24.4888	-.000227	.000652
dly1	-.0017434	.0015405	-1.21	0.227	4.75651	-.004763	.001276
istar1	.0023454	.0028115	0.88	0.379	8.13724	-.003165	.007856
overval1	.0000323	.0003691	0.09	0.930	-6.09677	-.000691	.000756
cadlag	.0040304	.0021502	1.99	0.047	3.04916	-.000184	.008245
opensh	-.0013253	.0005418	-2.59	0.010	58.873	-.002387	-.000263
obs. P	.0827815						
pred. P	.0258021	(at x-bar)					

z and P>|z| are the test of the underlying coefficient being 0.

FIGURE 1: 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

References

(INCOMPLETE)

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 Canoical 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-fulfiling 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 Mangement." In R. Glick *ed. Managing Capital Flows and Exchange Rate Rates,* Cambrige: 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, Ridiger. 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* A*ssessment.* 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.

Milesi-Ferretti, Gian Maria and Assaf Razin. 2000, “Current Account Reversals and Curreency Crises: Empirical Regularities” in P. Krugman (Ed), *Currency Crises*, U. of Chicago Press

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. 2000. “The Onset of the East Asian Financial Crisis.” in P. Krugman (Ed), *Currency Crises*, U. of Chicago Press

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.

Ventura, Jaume. 1999.

Wang, Yan and John D. Shilling. 1995. “Managing Capital Flows in East Asia.” World Bank Discussion Paper.