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DOES THE CURRENT ACCOUNT MATTER?

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ABSTRACT

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 covers over 120 countries during more than 25 years. Important controversies related to the current account – including the extent to which current account deficits help predict currency crises – are also analyzed. Throughout the paper I am interested in analyzing whether there is evidence supporting the idea that there are costs involved in running "very large" deficits. Moreover, I investigate the nature of these potential costs, including whether they are particularly high in the presence of other type of imbalances.

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I. Introduction

The currency crises of the 1990s shocked investors, 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 is 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 major currency crashes, according to others the current account has not been overly important 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 (1996), 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. Throughout the paper I am interested on whether there is evidence supporting the idea that there are costs involved in running "very large" deficits. Moreover, I investigate the nature of these potential costs, including whether they are particularly high in the presence of other type of imbalances.

The rest of the paper is organized as follows: In Section II I review the way in which economists' *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 "current 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 that have recently become popular in financial institutions, both private and official. More specifically, I argue that although these models provide some useful information about the long run sustainability of the external sector accounts, they are of limited use to determine if, a particular moment in time, a country's current account deficit is "too large." 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 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, and 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 (1951), Harberger (1950), Laurence and Metzler (1950), Machlup (1943), and Johnson (1955) --, 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 (1971a, 1971b) 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. Cooper (1971a), argued although the relevant elasticities were indeed small, devaluations had, overall, been successful in helping improve the trade and current account balances in the countries in his sample. In an extension of Cooper's work,

[3] See, for example, Meade's (1951) discussion in pages 35-36.

Kamin (1988) confirmed the results that historically (large) devaluations tended to improve developing countries' trade balance.

Authors in the structuralist tradition argued that in the developing nations 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 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. 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.

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:[4]

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

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 (Y_t^*) is defined as :

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

The sum runs from j=t to infinity. That is, equation (2) 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 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

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

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^*. With 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, $B_t > 0$.[5] 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 (Obstfeld and Rogoff, 1996). 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. Razin and Svensson (1983), for example, built an 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 mocdern optimizing models of the current account.

Numerical simulations based on the intertemporal approach sketched above, suggest that a country's optimal response to negative 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 models' result is that a small country can accumulate a very large external debt, and will have to run a sizeable trade *surplus* in the steady state in order to repay it. The problem, however, is that the external accounts and the external debt ratios implied by these models 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.[6] 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.[7] 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 (2000) 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 the rate of technological progress is equal to that of the rest of the world. The authors calibrate the model for the case of Spain, and find that the optimal response to a financial reform is to run a current account deficit that peaks at 60% of GDP.[8] As the authors themselves acknowledge, this figure tends to contradict strongly what is observed in reality. Following the financial liberalization reform, Spain's current account deficit peaked at 3.4% of GDP.

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[5] See Obstfeld abd Rogoff (1996).

[6] Small means that the cost of borrowing does not rise with the qiantity.

[7] 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.

[8] 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.

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 with Brazil's characteristics should accumulate foreign debt in excess of 300% of 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, and are not usually observed in the real world. Fernandez de Cordoba and Kehoe (2000) 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 by assuming costly and slow factor mobility across sectors they could generate current account deficits in their simulation exercises that were more modest – although still very high from a historical perspective. More recently, a number of authors have developed models with borrowing constraints in an effort to generate current account paths that are closer to reality.

II.2.2 Policy Interpretations of the Intertemporal Approach

An important policy implication of the intertemporal perspective is that policy actions 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 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%.[9] 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 Lawson, and has become to be known as *Lawson's Doctrine*.

The respected Australian economist Max Corden has possibly been the most articulate 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,

> "[A]n 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)."

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

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

In light of the debt crisis of 1982, 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 high and increasing. Fischer (1988) made this point forcefully in an article on real exchange rate overvaluation and currency crises:

> "The primary indicator [of a looming crisis] 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 is not whether there is 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 years immediately following the 1982 debt crisis, Cline (1988) also emphasized the importance of current 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 (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 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, however, 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). 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, and in the midst of international capital abundance, 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 years preceding the peso crisis of 1994-95. 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. In 1993 the Bank of Mexico maintained that:

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

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. According to him, two of the most influential cabinet members – Secretary of Commerce Jaime Serra and Secretary of Programming, and future president, Ernesto Zedillo -- pointed out in the early 1990s that, since the public sector was in equilibrium, Mexico's large current account deficit was harmless.[10]

Not everyone, however, agreed with this position. In the 1994 Brookings Panel session on Mexico, Stanley Fischer 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).

The World Bank staff expressed concern about the widening current account deficit. 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).

II.5 Views on the Current Account in the Post 1990s Currency Crashes

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 (1996,

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

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). According to Secretary Summers "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, Pesenti, 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 (2000) 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. A close analysis of the data shows, however, 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).

In view of the (perceived) limited importance of the current account, many authors have developed crisis models where the current account deficit is not central. In Calvo (2000), for example, a currency crisis responds to financial fragilities in the country in question and is independent of the current account. A particularly important

fragility is the mismatch between the maturity of banks' assets and obligations. Chang and Velasco (2000) have developed a series of models where a crisis is the result of self-fulfilling expectations. A somewhat different line of research has emphasized the role of 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 this type of models is that the optimal current account deficit does not take the implausible values generated by the small country models discussed above. Moreover, in borrowing constraints 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. A good example is Atkenson and Rios-Rull (1996) model of a credit-constrained country. In this setting current account problems may arise even if fiscal and monetary policies are consistent; all it takes is that investors' perceptions change.

An important consequence of the 1990s currency crushes was that market participants, and in particular private investors, became concerned with the evolution of emerging nations' current account balances. This has been translated in formal efforts to develop models of current account "sustainability." The issue at hand has been succinctly put by Milesi-Ferreti and Razin (1996) as follows: "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…"

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 (as in East Asia) 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:[11]

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

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,

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

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

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.[12]

In this framework, and under the simplifying assumption that international reserves don't change, the "sustainable" current account ratio is given by:[13]

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

where g_j is the country's sustainable rate of growth, and π^*_j is a valuation factor (approximately) equal to international inflation.[14] 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

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

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

[14] 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)

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 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 does it exceed 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.

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

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.[15]

IV. Current Account Behavior since the 1970s

In this section I provide a broad analysis of current account behavior in both emerging and advanced countries. The section deals with three specific issues: (1) the distribution of the current account across regions. (2) The persistence of high current account deficits. And (3), a detailed analysis of current account reversals and their costs. The discussion of the relationship – if any – between current account deficits and financial crises is the subject of section V.

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

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?" "Historically, for how long have countries been able to run 'large' current account deficits?" The data are 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 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 contains medians, and 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 as cut-off points to define "high deficit" countries. Later in this section I analyze the persistence of high deficits in each of the six 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 corresponding to 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."[16] 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. 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 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?

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

Second, from a historical point of view, have these reversals been associated with currency or financial crashes? And third, how costly, in terms of economic performance indicators, 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).[17]

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.[18]

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 regions are Africa and the Middle East, with 27 and 26 percent of reversals 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 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.[19] These results indicate that for the sample as a whole, 45 percent of the "reversals" were translated into a medium term (three year) improvement in the current account balance.

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

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

[19] 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.

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 only 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 relied on 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 highly probable, 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 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 a number of private savings equations for developing countries, and found that the coefficient of the current account deficit was significant and 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 whether indeed current account reversals have affected aggregate investment negatively, I estimated a number of investment equations using panel data for a large number of countries for the period 1970-1997. The recent empirical literature on investment, including Attanasio et al (2000), indicates that investment exhibits a strong degree of persistence through time. This suggests estimating equations of the following type:[20]

$$(10) \quad INVGDP_{t\,j} = \beta\, INVGDP_{t-1\;j} + \delta\, GOVCONS_{t\,j} + \phi\, TRADE\_OPENNESS_{t\,j} + \gamma\, REVERSAL_{t\,j} + \omega_{t\,j}.$$

Where INVGDP is the investment to GDP ratio, GOVCONS is the ratio of government expenditure to GDP, and TRADE_OPENNESS is an index that captures the degree of openness of the economy. 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.[21] Finally, ω is an error term, which takes the following form:

$$\omega_{t\,j} = \varepsilon_{j} + \mu_{t\,j},$$

where ε_{j} is a country specific error term, and $\mu_{t\,j}$ is an iid disturbance with the standard characteristics.

The estimation of equation (10) presents two problems. First, it is well known from early work on dynamic panel estimation by Nerlove (1971) that if the error contains

[20] 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).

[21] In principle, the log of initial GDP may also be included. However, because of the panel nature of the data, and given the estimation procedures used this is not possible.

a country specific term, the coefficient of the lagged dependent variable will be biased upward. There are several ways of handling this potential problem. Possibly the most basic approach is using a fixed-effect model, where a country dummy (hopefully) picks up the effect of the country specific disturbance. A second way is to estimate the instrumental variables procedure recently proposed by Arellano and Bond (1991) for dynamic panel data. This method consists of differentiating the equation in question – equation (10) in our case --, in order to eliminate the country specific disturbance ε_j. The differenced equation is then estimated using instrumental variables, where the lagged dependent variable (in levels), the predetermined variables (also in levels), and the first differences of the exogenous variables are used as instruments. In this paper I report results from the estimation of equation (10) using both a fixed effect procedure as well as the Arellano and Bond method.

A second problem in estimating equation (10) is that, since current account reversals are not drawn from a random experiment, the $REVERSAL_{jt}$ dummy is possibly correlated with the error term. Under these circumstances the estimated coefficients in equation (10) will be biased and misleading. In order to deal with this problem I follow the procedure recently suggested by Heckman et al (1997, 1998) for estimating *"treatment interventions"* models. This procedure consists of estimating the equation in question using observations that have a common support for both the treated and the non-treaded. In the case at hand, countries that experience a reversal are considered to be subject to the "treatment intervention." From a practical point of view, a two steps procedure is used: (1) The conditional probability of countries facing a reversal – this is called the *propensity score* -- is first estimated using a probit regression. (2) The equation of interested is estimated using only observations whose estimated probability of reversal fall within the interval of estimated probabilities for countries with actual reversals. I follow the Heckman et al (1997, 1998) sample correction both for the fixed effect and the Arellano and Bond procedures. In estimating the propensity scores I used a panel data probit procedure, and included as regressors the level of the current account deficit in the previous period, the level of the fiscal deficit, domestic credit creation, and time specific dummies. The results obtained from this first step are not presented here due to space consideration, but are available on request. Table 10 contains the results of

estimating investment equation (10) on an un-balanced panel of 128 countries for period 1971-1997. In Table 10.a I present the results obtained from the estimation of the Arellano-Bond instrumental variables procedure. In Table 10.b I present the results from the fixed effect estimation. In both cases I have introduced the REVERSALS indicator both contemporaneously, as well as with a one period lag. In the Arellano-Bond estimates the standard errors have been computed using White's robust procedure that corrects for heteroskedasticity. The results obtained are quite interesting. In both panels the coefficient of the lagged dependent variable is relatively high, capturing the presence of persistence. Notice, however, that the coefficient is significantly smaller when the Arellano-Bond procedure is used. The coefficient of GOVCON is positive and non significant. The estimated coefficient of trade openness is significant and positive, indicating that after controlling for other factors, countries with a more open trade sector will tend to a higher investment to GDP ratio. More important for this paper, the coefficients of the contemporaneous and lagged reversal indicator are significantly negative, with very similar point estimates. Interestingly, when the REVERSAL variable was added with a two-year lag its estimated coefficient was 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 important question is whether current account reversals have affected economic growth through other channels. I investigated this issue by using the large data set to estimate a number of basic growth equations of the following type.

$$(11)\quad GROWTH_{tj} = \beta\, INVGDP_{tj} + \delta\, GOVCONS_{tj} + \phi\, TRADE\_OPENNESS_{tj} + \theta\, LOGGDPO_{j} + \gamma\, REVERSAL_{tj} + \xi_{tj}.$$

W here $GROWTH_{tj}$ is growth of GDP per capita in country j during year t, and $LOGGDPO_{j}$ is the initial level of GDP (1970) for country j. 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 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. The error ξ_{tj} is assumed to be heteroscedastic, with a different variance for each country (panel). Thus, assuming k panels (countries):

$$(12)\quad E[\xi\xi'] = \begin{pmatrix} \sigma^2_1\,\mathbf{I} & 0 & \dots & 0 \\ 0 & \sigma^2_2\,\mathbf{I} & \dots & 0 \\ & . & . & . \\ . & . & . & . \\ 0 & 0 & \dots & \sigma^2_k\,\mathbf{I} \end{pmatrix}$$

Equation (12) 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 (11) are presented in Table 11. In addition to the regressors in equation (11) I introduced time specific dummy variables. As may be seen from the Table, the results obtained support the hypothesis that current account reversals have had a negative effect on GDP

per capita growth, even after controlling by investment. Moreover, the coefficients for the other variables in the regression have the expected signs, and are significant at conventional levels. When alternative estimation techniques were used, including fixed effects, the results obtained were very similar.[22]

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, much of 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, 1996; 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, Rose and Wyplosz 1996,

[22] Naturally, when fixed effects are used it is not possible to include (the log of) initial GDP as a regressor.

Goldstein 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***.[23] 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 three 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 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***.

How frequent have currency crises been, according to these indicators,? 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 – the results are not presented in detail due to space considerations --, 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 highest frequency of crises has been in Africa with a 13.7% frequency of occurrence .

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

An important finding from the preceding analysis is that current account reversals are common and quite frequent. Countries in every region tend to run deficits that occasionally exceed their long run sustainable level. This means that, as documented above, at some point the country has to go through an adjustment process where the current account deficit is reversed and moves closer to its long run equilibrium. From a policy perspective it is important to understand whether current account reversals are related to currency crises. In order to address this issue I followed a *case-control* methodology.[24] This approach consists of formally testing – 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 account reversal. From this information an odds ratio is computed, and a χ^2 test is computed in order to determine whether the odds ratio is significantly different from 1. If the 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.

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

[24] This approach is used frequently by epidemiologists. I became interested in statistical techniques used by epidemiologists in doing research on financial crisis contagion across countries. See Edwards (2000). See Fleiss (1981) for details on the actual case-control method.

The computation of the χ^2 test statistic using contemporaneous values of crisis and reversals results 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 on the order of 0.6, or higher. This result is consistent with the conclusions reached through a less formal analysis, and using a smaller data set, by Milessi-Ferreti and Razin (2000).

A possible limitation of a simple application of this $\chi 2$ 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 reasons to believe that reversals may occur at the same time as a crisis, before a crisis, or even after a "crisis." For instance, 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. There is no reason, however, why these phenomena would take place at exactly the same time. 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 years. 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, the results obtained from the computation of these $\chi 2$ statistics when the ***aevent*** definition of crisis was considered as the "case." In order to illustrate the nature of the results I have presented the $\chi 2$ corresponding to two definitions of reversals. 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.[25] Results obtained for the other three definitions of crisis are very similar and are available from the author on request.

V.3 Current Account Deficits and Currency Crises: A Formal Analysis

In a recent and influential paper, Frankel and Rose (1996) empirically analyzed the determinants of currency crashes. Their data set included 105 countries for the period 1970-1991, and their definition of crisis was confined to devaluations in excess of 25%.[26] 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 it even 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).[27]

My own initial analysis of the determinants of crises, using an almost identical data set, supports the results reported by Frankel and Rose (1996). When a broad sample and their regressors are used, the current account seems to play no role in major currency crashes.[28] 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 a regressor. 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, and in an effort to determine the robustness of these results, I followed four 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 finding of current account "irrelevancy." 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. Third,

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[25] 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.

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

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

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

I considered 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***. And fourth, I used different estimation techniques, and considered assumptions regarding the nature of the error term, including that it takes a random effect form. Generally speaking, the results obtained were not affected by the technique used, and for this reason I only report the basic results.

In the estimation of crisis models I used the following regressors:[29] (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; (14) the ration of government expenditure to GDP; (15) interest rates in the advanced countries; and (16) the current account deficit. All the variables are from the World Bank and , as in the Frankel and Rose (1996) paper, cover the 1971-1992 period. With the exception of the crisis indexes, the trade openness and government consumption, these variables correspond to those used by Frankel and Rose (1996).

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. In all of the regressions I report White's robust standard errors, that correct for heteroskedasticity.

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. In terms of the current account – the variable of greatest interest in this paper --, the results show significant differences, depending on the definition of crisis used. For both the ACRISIS and ACRISIS2 indicators the estimated coefficient of the current account deficit to GDP is positive and significant at the 10% level. On the other hand, when the AEVENT and AEVENT2

[29] 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.

currency crash indicators are used as the dependent variable, the estimated coefficients of the current account deficits are not significant, and in the case of AEVENT2, it has the incorrect sign (although it is not significantly different from zero). Of course, the results for the EVENTs correspond to the Frankel and Rose (1996) findings discussed above. In terms of the other regressors, the results in Table 14 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. A greater degree of openness reduces the probability under all both crisis definitions. Notice that in contrast with the Frankel and Rose (1996) results, a higher public deficit ratio significantly increases the probability of ***Aevent*** type crises.

The results presented in Table 14 were obtained using a data set that covers every region. There are, however, important reasons to believe that (most) African countries have behaved differently during the period under study. 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 was the case even when the external imbalance was very large (World Bank 1994). An important question, then, is how will these results be affected if the African nations are excluded from the sample. This is done in Table 15, where probit regressions for our four crisis definitions are presented for a non-Africa sample. As may be seen, when this is done, the estimated coefficient of the current account deficit are positive and significant either at the 5 or 10% level. It is important to notice that what makes a difference here is whether Africa is included in the sample or not. If instead of focusing on Africa I use GDP per capita as the key variable to split the sample – as Milessi-Ferreti and Razin (2000) do --, and I only include middle income countries, the results are not as sharp as those reported in Table 15.

The results presented above, follow Frankel and Rose (1996), and control for a number of variables, including the external debt ratio, capital flows in the form of FDI and international reserves. A problem with including this group of controls, however, is that it becomes difficult to interpret the current account coefficient in the probit

regressions. The reason for this is that we are not allowing the current account deficit to be financed through the traditional channels: an increase in indebtness and/or a reductioin in international reserves. In fact, in the results reported above – as well as in Frankel and Rose (1996) – higher account deficits are being financed exclusively by an increase in non-debt generating capital inflows. It is interesting to understand, however, if an increase in the current account deficit that is financed by running up the debt and/or running down international reserves increases the probability of a crisis. The results in Table 16, which were obtained when both reserves and debt are not included as controls, show that an increase in the current account deficit financed by traditional means indeed increases the probability of an ***aevent*** type of crisis.[30]

As a final exercise, and in order to analyze the robustness of these results I investigated whether they held under different lag structures for the regressors. In 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 indicate that when this alternative lag structure is used, the coefficient of the current account deficit remains positive and significant at conventional levels. 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.

To sum up, the results presented in this sub-section suggest that the effects of larger current account deficits on crisis depend on both the definition of crisis and on the region's of the world being covered. More specifically, the results indicate that when the broader definitions ACRISIS and ACRISIS2 are used, a higher current account deficit increases the probability of crisis in the larger sample. Higher current account deficits also increase the probability of AEVENT crises significantly when the African nations are excluded from the sample.

[30] The resultsa for an ***acrisis*** type of crisis are similar and are not reported here due to space considerations.

VI. Concluding Remarks

The main question addressed in this paper is whether the current account "matters." If this question is interpreted very narrowly, in the sense that countries with an (arbitrarily defined) large current account deficit, almost inevitably face a crisis, then the answer is "no." If, however, it is interpreted more broadly, as suggesting that there are costs involved in running "very large" deficits, the research reported in this paper suggests that the answer is a qualified "yes." [31]

The analysis presented in this paper has shown that large current account deficits tend not to be persistent. Very few countries run large deficits for five years in a row, and only a handful have run large deficits for ten years in a row. As the analysis in Section IV of this paper suggests, the typical mechanics of current account deficits is that countries that experience large imbalances do so for a limited time; after a while these imbalances are reduced and a current account reversal is observed. In section IV I analyzed in detail the consequences, in terms of economic performance, of current account reversals using a large (unbalanced) panel of countries for 1970-1997. Using recently developed econometric techniques I found that, contrary to what has been recently suggested, reversals do have a negative effect on economic performance. They affect negatively aggregate investment; moreover, even when I control for investment, the regression analysis suggests that reversals have a negative impact on GDP growth per capita.

In section V I addressed the narrower question of whether larger deficits increase the probability of a country experiencing a currency crisis. My results suggest that the answer to this question depends on the definition of crisis, as well as on the sample used in the analysis. As the detailed explanation I that section indicate, my results show that when Africa is excluded – and I argue that there are good reasons for doing it --, an increase in the deficit raises the probability of a crisis, independently on how this is defined. When the complete sample is used, higher deficits increase the probability of

[31] Naturally, a major challenge in this work is defining what a large deficit means. In theory large should mean (significantly) larger than the sustainable level. In practice, however, and as shown in Section III of this paper existing sustainability models are not very useful, especially in a dynamic environment. For this reason in this paper I have defined a "high deficit" arbitrarily, as a deficit that for that year exceeds the third quartile of the deficit distribution for the region to which the country belongs.

broadly defined crises. They have no statistical effect on narrowly defined crashes, however.

In sum, my conclusion is that, in spite of recent claims of the irrelevancy of current account deficits, the evidence provides a rather strong support for the view that, from a policy perspective, large deficits should be a cause for concern. This does not mean, of course, that every large deficit leads to a crisis; nor does it mean that only when there is a large current account deficit a crisis can take place.

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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

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

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

C. Asia

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

D. Africa

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

Cyprus	1977-1981

F. Eastern Europe

None

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* 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

a. Arellano-Bond Instrumental Variables

```
Arellano-Bond dynamic panel data                Number of obs      =      1800
Group variable (i): imfcode                     Number of groups   =       127

                                                Wald chi2(5)       =    181.56

Time variable (t): year                         min number of obs  =         1
                                                max number of obs  =        25
                                                mean number of obs =  14.17323
------------------------------------------------------------------------------
             |               Robust
invgdp       |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
invgdp       |
          LD |   .6212481   .0835012     7.44   0.000     .4575887    .7849075
govcon       |
          D1 |   .0819257   .1063111     0.77   0.441    -.1264401    .2902916
rev          |
          D1 |  -2.021207   .2545002    -7.94   0.000    -2.520018   -1.522396
revlag       |
          D1 |  -.8834781   .2235849    -3.95   0.000    -1.321696   -.4452596
trade        |
          D1 |   .0436178   .0127593     3.42   0.001     .0186101    .0686255
_cons        |  -.0480371   .0169209    -2.84   0.005    -.0812014   -.0148727
------------------------------------------------------------------------------
Arellano-Bond test that average autocovariance in residuals of order 1 is 0:
         H0: no autocorrelation   z =  -4.46   Pr > z = 0.0000
Arellano-Bond test that average autocovariance in residuals of order 2 is 0:
         H0: no autocorrelation   z =  -1.08   Pr > z = 0.2809
```

b. Fixed Effects Method

```
Fixed-effects (within) regression               Number of obs      =      1927
Group variable (i) : imfcode                    Number of groups   =       128

R-sq:  within  = 0.6523                         Obs per group: min =         1
       between = 0.9301                                        avg =      15.1
       overall = 0.8357                                        max =        26
                                               F(5,1794)          =    672.98
corr(u_i, Xb)  = 0.3082                         Prob > F           =    0.0000
------------------------------------------------------------------------------
      invgdp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     invgdp1 |   .7655012   .0139967    54.69   0.000     .7380497    .7929527
      govcon |   .0326171   .0186247     1.75   0.080    -.0039113    .0691455
         rev |   -2.05903   .1622943   -12.69   0.000    -2.377336   -1.740724
      revlag |  -.8404217   .1585791    -5.30   0.000    -1.151441   -.5294026
       trade |   .0324689   .0051885     6.26   0.000     .0222927     .042645
       _cons |   3.266194   .4745214     6.88   0.000     2.335521    4.196867
-------------+----------------------------------------------------------------
     sigma_u |  1.6838827
     sigma_e |  2.4746612
         rho |  .31647855   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(127, 1794) =     2.61           Prob > F = 0.0000
```

TABLE 11
GDP GROWTH AND CURRENT ACCOUNT REVERSALS
Feasible Least Squares with Heteroskedastic Panels

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares
Panels: heteroskedastic
Correlation: no autocorrelation

Estimated covariances	= 111	Number of obs	= 1856
Estimated autocorrelations	= 0	Number of groups	= 111
Estimated coefficients	= 32	Obs per group: min	= 1
		avg	= 19.28987
		max	= 26
		Wald chi2(31)	= 708.80
Log likelihood	= -4913.651	Prob > chi2	= 0.0000

gdpgrowt	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
invgdp	.1732786	.0129535	13.38	0.000	.1478901	.198667
govcon	-.044147	.0129061	-3.42	0.001	-.0694425	-.0188514
trade	.0066118	.0021185	3.12	0.002	.0024595	.010764
loggpp0	-.7458834	.0754805	-9.88	0.000	-.8938225	-.5979443
rev	-.8387433	.2063497	-4.06	0.000	-1.243181	-.4343053
revlag	-.3106008	.2014468	-1.54	0.123	-.7054293	.0842277
d73	1.270318	.759329	1.67	0.094	-.2179398	2.758575
d74	-1.342419	.7482716	-1.79	0.073	-2.809004	.1241666
d75	-3.115973	.7482444	-4.16	0.000	-4.582505	-1.649441
d76	.6267746	.7248618	0.86	0.387	-.7939283	2.047478
d77	-.9757318	.6522791	-1.50	0.135	-2.254175	.3027116
d78	.1379759	.5050662	0.27	0.785	-.8519357	1.127887
d79	-1.096983	.6317958	-1.74	0.083	-2.33528	.1413142
d80	-2.360201	.6280218	-3.76	0.000	-3.591101	-1.129301
d81	-2.826354	.6242467	-4.53	0.000	-4.049855	-1.602853
d82	-4.194326	.6217559	-6.75	0.000	-5.412945	-2.975707
d83	-2.990355	.6199746	-4.82	0.000	-4.205483	-1.775227
d84	-1.221758	.6185186	-1.98	0.048	-2.434032	-.0094836
d85	-1.784731	.6187208	-2.88	0.004	-2.997401	-.5720605
d86	-1.75282	.617261	-2.84	0.005	-2.962629	-.5430107
d87	-1.596635	.6173792	-2.59	0.010	-2.806676	-.3865935
d88	-.7132081	.6150168	-1.16	0.246	-1.918619	.4922027
d89	-1.492796	.6147887	-2.43	0.015	-2.69776	-.2878324
d90	-2.005303	.6140373	-3.27	0.001	-3.208794	-.8018121
d91	-2.686583	.6082038	-4.42	0.000	-3.878641	-1.494526
d92	-2.38132	.6155925	-3.87	0.000	-3.587859	-1.17478
d93	-2.23038	.6150288	-3.63	0.000	-3.435814	-1.024945
d94	-.8790476	.6164939	-1.43	0.154	-2.087353	.3292582
d95	-.9938183	.5940141	-1.67	0.094	-2.158065	.170428
d96	-1.480438	.6129868	-2.42	0.016	-2.68187	-.2790063
d97	-1.263988	.6449348	-1.96	0.050	-2.528037	.0000611
_cons	7.826786	.8179467	9.57	0.000	6.22364	9.429932

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

Case: *Aevent* **definition of crisis;**
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

Case: *Aevent* **definition of crisis;**
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 14
CRISIS PROBIT MODEL: ALL REGIONS
(1971-1992)

A. ACRISIS

Probit estimates — Number of obs = 931
Wald chi2(17) = 56.70
Prob > chi2 = 0.0000
Log likelihood = -274.9083 — Pseudo R2 = 0.1103

acrisis	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0033323	.0017217	1.90	0.057	21.0027	-.000042	.006707
conrat	-.0010057	.0007642	-1.30	0.193	32.5979	-.002504	.000492
varrat	-.0025776	.0016872	-1.51	0.131	21.9735	-.005884	.000729
fdistock	-.0052372	.0022728	-2.27	0.023	2.62669	-.009692	-.000783
shorttot	.0019636	.0015704	1.27	0.203	14.6745	-.001114	.005041
pubrat	.0009573	.0010942	0.88	0.381	72.419	-.001187	.003102
multirat	.0020735	.0008301	2.44	0.015	21.4711	.000447	.0037
debty	.0002462	.0002104	1.16	0.247	59.5954	-.000166	.000659
reservem	-.0000357	.0000375	-0.94	0.345	324.331	-.000109	.000038
defrat	.0011096	.0016363	0.68	0.497	5.15325	-.002097	.004317
dlcred	.0010474	.0003367	3.23	0.001	21.875	.000387	.001707
dly	-.0027143	.0013687	-2.00	0.046	3.51322	-.005397	-.000032
istar	.0020625	.0030204	0.68	0.497	8.64066	-.003857	.007982
overvaln	.0001934	.0004058	0.48	0.634	-7.88634	-.000602	.000989
trade	-.0009073	.0005028	-1.74	0.082	46.3937	-.001893	.000078
govcon	-.0001539	.0017092	-0.09	0.928	14.0511	-.003504	.003196
cad	.0031167	.0016689	1.83	0.067	4.36866	-.000154	.006388
obs. P	.1031149						
pred. P	.0773022	(at x-bar)					

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

B. ACRISIS2 Definition of Crisis

Probit estimates — Number of obs = 562
Wald chi2(17) = 56.69
Prob > chi2 = 0.0000
Log likelihood = -178.57014 — Pseudo R2 = 0.1387

acrisis2	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0046036	.0026754	1.65	0.100	19.9146	-.00064	.009847
conrat	-.0012766	.0010286	-1.24	0.213	34.1878	-.003293	.000739
varrat	-.0044843	.0025206	-1.71	0.086	21.1016	-.009425	.000456
fdistock	-.0046245	.0028175	-1.65	0.099	3.12262	-.010147	.000898
shorttot	.0014552	.0020551	0.71	0.479	14.7062	-.002573	.005483
pubrat	-.0001517	.0014676	-0.10	0.918	72.5714	-.003028	.002725
multirat	.003031	.0010866	2.66	0.008	21.5175	.000901	.005161
debty	.0002802	.0003342	0.83	0.404	54.2499	-.000375	.000935
reservem	-.0000196	.0000514	-0.38	0.703	328.907	-.00012	.000081
defrat	.0020843	.002524	0.82	0.410	4.60205	-.002863	.007031
dlcred	.0020764	.0005264	4.02	0.000	18.7089	.001045	.003108
dly	-.002937	.0019957	-1.48	0.140	3.97093	-.006849	.000975
istar	.0052748	.0038629	1.36	0.173	8.50495	-.002296	.012846
overvaln	.0005167	.000559	0.91	0.361	-8.22226	-.000579	.001612
trade	-.0008263	.0006416	-1.28	0.201	47.0451	-.002084	.000431
govcon	.0016096	.002514	0.65	0.518	13.8002	-.003318	.006537
cad	.0039213	.0023943	1.61	0.107	3.95843	-.000771	.008614
obs. P	.1209964						
pred. P	.0854189	(at x-bar)					

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

C. Aevent Definition

Probit estimates — Number of obs = 934
Wald chi2(17) = 70.66
Prob > chi2 = 0.0000
Log likelihood = -189.0942 — Pseudo R2 = 0.2072

aevent	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.0003686	.0008709	0.42	0.671	20.962	-.001338	.002075
conrat	-.000823	.0004234	-1.82	0.069	32.6715	-.001653	6.9e-06
varrat	-.0007301	.0008421	-0.86	0.388	21.9302	-.002381	.000921
fdistock	-.0033417	.0012196	-2.69	0.007	2.62084	-.005732	-.000951
shorttot	-.0000499	.0008731	-0.06	0.955	14.6571	-.001761	.001661
pubrat	-.0001298	.0006229	-0.21	0.836	72.4703	-.001351	.001091
multirat	-.0002948	.0005312	-0.56	0.578	21.4961	-.001336	.000746
debty	.0002863	.0001209	2.49	0.013	59.7336	.000049	.000523
reservem	-.0000194	.0000197	-1.01	0.315	325.061	-.000058	.000019
defrat	.0016828	.0009088	1.85	0.065	5.21531	-.000098	.003464
dlcred	.0004188	.0002005	2.53	0.012	21.8889	.000026	.000812
dly	-.001096	.0008227	-1.34	0.179	3.51907	-.002708	.000516
istar	-.0000236	.0017433	-0.01	0.989	8.63804	-.00344	.003393
overvaln	-.0003881	.0002363	-1.64	0.102	-7.82043	-.000851	.000075
trade	-.001114	.0003071	-3.06	0.002	46.3682	-.001716	-.000512
govcon	-.0037107	.0012011	-2.97	0.003	14.071	-.006065	-.001357
cad	.0003098	.0010221	0.30	0.764	4.37692	-.001693	.002313
obs. P	.0706638						
pred. P	.0296255	(at x-bar)					

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

D. Aevent2 Definition

Probit estimates — Number of obs = 702
Wald chi2(17) = 48.97
Prob > chi2 = 0.0001
Log likelihood = -117.36778 — Pseudo R2 = 0.2208

aevent2	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	-.000135	.0009079	-0.15	0.883	19.8866	-.001914	.001644
conrat	-.0003336	.000392	-0.85	0.395	35.0182	-.001102	.000435
varrat	7.77e-06	.0008146	0.01	0.992	20.4507	-.001589	.001604
fdistock	-.0015405	.0009866	-1.62	0.104	3.08108	-.003474	.000393
shorttot	.0005935	.0007601	0.81	0.416	14.3259	-.000896	.002083
pubrat	.000125	.0005304	0.24	0.810	72.7421	-.000914	.001164
multirat	-.0004797	.0005018	-0.94	0.349	22.8628	-.001463	.000504
debty	.0002004	.0001292	1.62	0.105	54.0278	-.000053	.000454
reservem	-.0000252	.0000191	-1.38	0.166	328.073	-.000063	.000012
defrat	.0022043	.0010298	2.11	0.035	4.93033	.000186	.004223
dlcred	.0005069	.000229	2.74	0.006	18.4827	.000058	.000956
dly	-.0015771	.0008004	-1.90	0.057	4.18559	-.003146	-8.3e-06
istar	.0000685	.0014788	0.05	0.963	8.62569	-.00283	.002967
overvaln	-.0001668	.0002045	-0.84	0.402	-7.73555	-.000568	.000234
trade	-.0007145	.0002938	-2.41	0.016	48.7758	-.00129	-.000139
govcon	-.0028422	.001161	-2.20	0.028	14.5617	-.005118	-.000567
cad	-.0007552	.0009831	-0.79	0.432	4.27947	-.002682	.001172
obs. P	.0555556						
pred. P	.0206342	(at x-bar)					

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

Table 15
Probit Model of Currency Crises
Africa Excluded
(1971-1992)

A. ACRISIS Definition

Probit estimates — Number of obs = 586
Wald chi2(17) = 47.59
Prob > chi2 = 0.0001
Log likelihood = -172.36345 — Pseudo R2 = 0.1381

acrisis	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]
comrat	.0029271	.0020359	1.42	0.157	26.3123	-.001063 .006917
conrat	-.0012155	.0008973	-1.32	0.186	28.4099	-.002974 .000543
varrat	-.0020405	.0019753	-1.02	0.306	27.1534	-.005912 .001831
fdistock	-.005784	.0024845	-2.24	0.025	3.17666	-.010653 -.000915
shorttot	.0016729	.002148	0.81	0.418	15.9367	-.002537 .005883
pubrat	.0014678	.0013265	1.13	0.258	69.9099	-.001132 .004068
multirat	.0026282	.000894	2.77	0.006	19.8038	.000876 .00438
debty	3.91e-06	.0003489	0.01	0.991	53.1143	-.00068 .000688
reservem	-7.38e-06	.0000403	-0.18	0.855	412.658	-.000086 .000072
defrat	.0010166	.0019793	0.52	0.606	4.5621	-.002863 .004896
dlcred	.0008556	.0003243	2.85	0.004	25.8435	.00022 .001491
dly	-.0021348	.0017565	-1.24	0.215	3.8471	-.005577 .001308
istar	.0026776	.0036062	0.73	0.466	8.48895	-.00439 .009746
overvaln	-.0000309	.0005285	-0.06	0.953	-5.23607	-.001067 .001005
trade	-.0010877	.0006823	-1.48	0.140	47.171	-.002425 .00025
govcon	.0017909	.0023691	0.76	0.448	13.3222	-.002852 .006434
cad	.0048408	.0021958	2.08	0.037	3.62618	.000537 .009145
obs. P	.1075085					
pred. P	.0718758	(at x-bar)				

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

B. ACRISIS2 Definition

Probit estimates — Number of obs = 349
Wald chi2(17) = 56.33
Prob > chi2 = 0.0000
Log likelihood = -102.86684 — Pseudo R2 = 0.2104

acrisis2	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	.004239	.0031281	1.27	0.203	25.0805	-.001892	.01037
conrat	-.0013723	.0013069	-1.08	0.279	30.3854	-.003934	.001189
varrat	-.0049427	.0028411	-1.67	0.095	26.3258	-.010511	.000626
fdistock	-.0015863	.0024665	-0.65	0.515	3.68785	-.006421	.003248
shorttot	.001403	.0024508	0.57	0.569	16.3144	-.003401	.006207
pubrat	-.0001419	.001806	-0.08	0.937	69.3619	-.003682	.003398
multirat	.003184	.0011121	2.54	0.011	19.659	.001004	.005364
debty	.0001755	.0006922	0.25	0.800	47.3123	-.001181	.001532
reservem	.0000193	.0000523	0.37	0.709	418.177	-.000083	.000122
defrat	.0015161	.0030651	0.49	0.625	3.85896	-.004491	.007524
dlcred	.0016191	.0005431	3.02	0.003	22.0399	.000555	.002684
dly	-.0028787	.0026685	-1.12	0.261	4.74403	-.008109	.002352
istar	.0047575	.0043004	1.12	0.264	8.25318	-.003671	.013186
overvaln	.0004106	.0006962	0.59	0.555	-3.96003	-.000954	.001775
trade	-.0019974	.0007404	-2.51	0.012	48.4653	-.003448	-.000546
govcon	.0074273	.0029808	2.69	0.007	12.9495	.001585	.01327
cad	.0066269	.0030252	2.15	0.032	2.94552	.000698	.012556
obs. P	.1232092						
pred. P	.0684454	(at x-bar)					

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

C. AEVENT Definition

```
Probit estimates                                  Number of obs =    588
                                                  Wald chi2(17) =  64.52
                                                  Prob > chi2   = 0.0000
Log likelihood = -121.01338                       Pseudo R2     = 0.2262

------------------------------------------------------------------------------
             |               Robust
      aevent |      dF/dx   Std. Err.      z    P>|z|     x-bar  [    95% C.I.   ]
-------------+----------------------------------------------------------------
      comrat |   .0005594   .0009588     0.58   0.561   26.2654   -.00132  .002439
      conrat |  -.0004993   .0005171    -0.89   0.373   28.4811  -.001513  .000514
      varrat |  -.0002586    .000949    -0.27   0.787   27.1044  -.002119  .001601
    fdistock |  -.0029753   .0012766    -2.27   0.023   3.16641  -.005477 -.000473
    shorttot |   .0009613   .0011325     0.91   0.363   15.9162  -.001258  .003181
      pubrat |   .0012306   .0008209     1.71   0.086   69.9671  -.000378   .00284
    multirat |  -.0006806   .0006162    -1.21   0.227   19.7912  -.001888  .000527
       debty |   .0000792   .0001567     0.51   0.613   53.3316  -.000228  .000386
    reservem |  -.0000334   .0000222    -1.57   0.115   412.677  -.000077   .00001
      defrat |   .0011607   .0009477     1.19   0.233   4.61603  -.000697  .003018
      dlcred |   .0002325   .0001554     1.85   0.064   25.8675  -.000072  .000537
         dly |  -.0015439   .0009927    -1.73   0.084   3.85051  -.003489  .000402
       istar |   .0001112   .0019632     0.06   0.955    8.4883  -.003737  .003959
    overvaln |  -.0003815   .0002373    -1.49   0.137  -5.18871  -.000847  .000084
       trade |  -.0010118   .0003537    -2.52   0.012   47.1363  -.001705 -.000318
      govcon |  -.0021182   .0012636    -1.57   0.116     13.35  -.004595  .000358
         cad |   .0018845   .0011319     1.62   0.105   3.64741  -.000334  .004103
-------------+----------------------------------------------------------------
      obs. P |   .0748299
     pred. P |   .0253162  (at x-bar)
------------------------------------------------------------------------------
    z and P>|z| are the test of the underlying coefficient being 0

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D. AEVENT2 Definition

Probit estimates — Number of obs = 424
Wald chi2(17) = 44.63
Prob > chi2 = 0.0003
Log likelihood = -73.926915 — Pseudo R2 = 0.2642

aevent2	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	-.000477	.0006752	-0.72	0.472	24.5388	-.0018	.000846
conrat	-.0001558	.0003666	-0.41	0.680	31.8778	-.000874	.000563
varrat	.0003588	.0006383	0.57	0.569	24.764	-.000892	.00161
fdistock	-.0011275	.0007419	-1.46	0.145	3.82585	-.002582	.000327
shorttot	.0000871	.0007133	0.12	0.901	15.8634	-.001311	.001485
pubrat	.0002927	.0005123	0.63	0.529	69.6303	-.000711	.001297
multirat	-.0011583	.0005954	-2.48	0.013	21.8597	-.002325	8.6e-06
debty	.0001485	.000146	1.05	0.295	45.5271	-.000138	.000435
reservem	-.000016	.0000162	-1.10	0.271	427.66	-.000048	.000016
defrat	.000573	.0007951	0.71	0.476	4.27868	-.000985	.002131
dlcred	.0000761	.000141	0.61	0.541	21.1944	-.0002	.000353
dly	-.0013861	.0008992	-1.99	0.046	4.62599	-.003148	.000376
istar	-.0002626	.0011823	-0.22	0.823	8.3681	-.00258	.002055
overvaln	-.0003454	.0001643	-2.03	0.042	-4.5647	-.000667	-.000023
trade	-.0008508	.0003236	-3.50	0.000	50.8592	-.001485	-.000217
govcon	-.0004142	.0008319	-0.48	0.630	13.843	-.002045	.001216
cad	.001496	.0009603	1.62	0.105	3.12759	-.000386	.003378
obs. P	.0636792						
pred. P	.01217	(at x-bar)					

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

Table 16
Crisis and the Current Account:
Probit Estimates, Alternative Set of Controls
(Africa Excluded, 1970-1992)

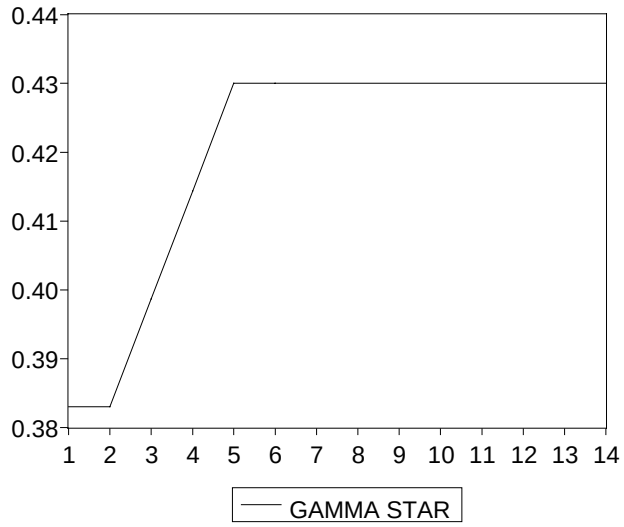
EXCLUDES RESERVES AND DEBT

Probit estimates — Number of obs = 591
Wald chi2(15) = 65.13
Prob > chi2 = 0.0000
Log likelihood = -124.15434 — Pseudo R2 = 0.2198

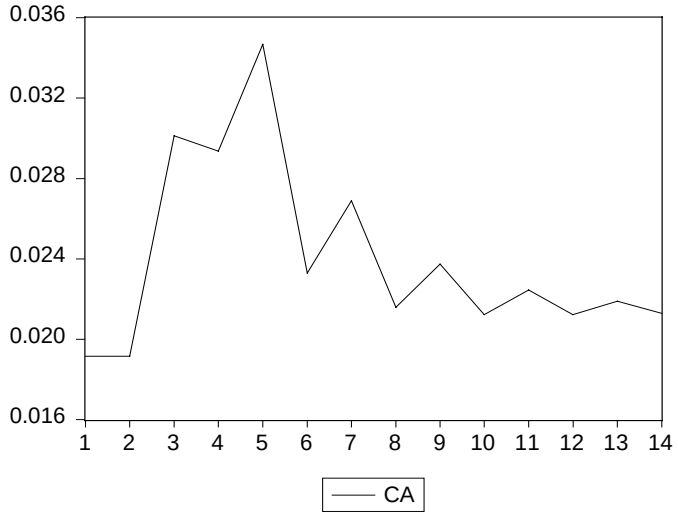
aevent	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95% C.I.]	
comrat	-.0000411	.0008099	-0.05	0.960	26.3022	-.001629	.001546
conrat	-.0005226	.000528	-0.93	0.354	28.4596	-.001557	.000512
varrat	.000294	.000864	0.34	0.731	27.1331	-.001399	.001988
fdistock	-.0034274	.0013471	-2.52	0.012	3.15382	-.006068	-.000787
shorttot	.0009178	.0011867	0.81	0.417	15.9153	-.001408	.003244
pubrat	.0012746	.0008641	1.65	0.099	70.0393	-.000419	.002968
multirat	-.0007383	.0006296	-1.27	0.202	19.7436	-.001972	.000496
defrat	.0017021	.000881	1.85	0.064	4.68826	-.000025	.003429
dlcred	.0002103	.0001511	1.66	0.096	26.0009	-.000086	.000506
dly	-.0018491	.0010946	-1.87	0.062	3.83729	-.003995	.000296
istar	.0003013	.0020829	0.14	0.885	8.48095	-.003781	.004384
overvaln	-.000391	.0002352	-1.52	0.128	-5.48445	-.000852	.00007
trade	-.0010849	.0003564	-2.56	0.011	47.1491	-.001783	-.000386
govcon	-.0019375	.0012981	-1.43	0.153	13.455	-.004482	.000607
cad	.0024955	.001186	2.09	0.037	3.71074	.000171	.00482
obs. P	.0761421						
pred. P	.0279486	(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