ON CURRENT ACCOUNT SURPLUSES AND THE CORRECTION OF GLOBAL IMBALANCES

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I. Introduction

During the last few years the United States has run an increasingly large current account deficit. Forecasts by J.P. Morgan suggest that in 2007 the deficit will reach almost one trillion dollars, or 7% of GDP. This unprecedented situation has generated concern among analysts and policy makers. Indeed, many have argued that this deficit is unsustainable and that, at some point, it will have to decline. Much of the recent research on the area has inquired whether the U.S. external adjustment will be gradual or abrupt, and how it will impact on the (real) value of the dollar.[1]

Of course, one country's current deficit must be another country, or countries, surpluses. In that regard, then, any discussion on the decline of the U.S. deficit implies a discussion of the reduction of the rest of the world's combined current account surpluses. This point was made forcefully by the Fed's Chairman Ben Bernanke in a March 2005 speech – before he became Chairman –, where he argued that the main cause of the U.S. external deficit was a major "savings glut" in the rest of the world. Bernanke's words generated significant controversy, and many newspaper pages and blogs were filled with commentary, on the future Chairman's views.[2]

Many of the participants in these current account debates have argued that regional growth differentials have been at the heart of "global imbalances." The argument runs along the following lines: rapid growth in the U.S. has been associated with an increase in U.S. investment (over savings); at the same time, slower growth in Europe and Japan has been associated with higher savings (relative to investment) in those parts of the world.[3] Global imbalances, the argument goes, are a reflection of these growth differentials. An implication of this perspective is that, far from reflecting a serious problem, the large current account deficits in the U.S. are a sign of strength; they

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[1] See, for example, recent papers published in the 2005(1) issue of the *Brookings Papers on Economic Activity*; see also the articles in the September 2006 issue of the *Journal of Policy Modeling*.

[2] See Bernanke (2005). Some recent theoretical papers have investigated this issue, and have inquired under what conditions the large U.S. deficit could be maintained through time. See, for example, Dooley, Folkerts-Landau and Garber (2004 and 2006). See also Caballero, Fahri and Gourinchas (2006), Loayza et al (2000), and De Gregorio (2005). On the global savings glut view see, also, Clarida (2005a,b), and Hubbard (2005). One of the few empirical papers on the savings glut is Chinn and Ito (2005). See Chinn and Lee (2005) for a VAR analysis of two surplus countries. See, also, Gruber and Kamin (2005). Two important volumes with papers on the U.S. deficit and global adjustment are Bergsten and Williamson (2003, 2004).

[3] Notice that this argument is very general, and refers to the relationship between investment, savings and growth; in fact, no causality is implied there is in the above statement.

reflect the fact that during the last few years the U.S. has been the locomotive of global growth. According to this view a realignment of growth – with an increase in growth in Europe and Japan and a slowdown in the U.S. – would play an important role in correcting global imbalances. In a recent interview, U.S. Secretary of the Treasury Hank Paulson "acknowledged to reporters that …he saw the problem of [the U.S.] deficits as …part of the problem of other imbalances in other countries." From here the Secretary went on to say: "The U.S. has for a good number of years now *been growing much faster* than the major developed trading partners, Europe and Japan." Then he added that for the imbalances to be corrected, Japan and Europe had "to *get the kind of growth* on the consumption side that is going to make the difference."[4]

In the 1940's Keynes was particularly interested in understanding the role of surplus countries in global adjustment. Indeed, his proposal for an international Clearing Union was based on the notion that in the face of large payments imbalances both deficit and surplus nations should share the burden.[5] In recent years, however, there have been very few empirical academic studies that have analyzed, in a systematic way, the process through which countries with large external surpluses have reduced their imbalances. This paucity of analyses contrasts with the case of current account deficits, a topic that has been analyzed extensively.[6]

The purpose of this paper is to analyze the historical evidence on the nature of current account adjustments in surplus countries. I am particularly interested in investigating whether large surpluses are persistent, and the process and speed through which large surplus countries have, in the past, reduced their imbalances. A particularly relevant issue is whether, historically, there have been large and abrupt declines in current account surpluses. The importance of this question is that such abrupt surplus adjustments would be required if, as some fear, the U.S. – and other Anglo Saxon countries, such as the U.K., Australia and New Zealand, for that matter – experience a sudden stop of capital inflows and rapid current account reversals. I also investigate the

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[4] Steven R. Weisman, "Paulson Shows Talent for Deflecting Criticism," *International Herald Tribune*, September 27, 2006; emphasis added.

[5] See, for example, the discussion in Chapter 6 of Skidelsky's (2000) third volume of Keynes' biography, and the papers, reports and memoranda by Keynes cited in that chapter.

[6] Of course, as pointed out above, at a definitional level the sum of all deficits is equal to the sum of all surpluses. So, knowing how all deficit countries behave on the aggregate tells us *exactly* how the sum of all surpluses behaves on the aggregate. This, however, is not a very interesting proposition.

connection between (large) surpluses and the business cycle, and I ask whether it is likely that, as recently argued by U.S. Secretary of the Treasury Hank Paulson and others, once the non Anglo-Saxon advanced countries experience an acceleration in their rates of growth, there will be a decline in their surpluses and, thus, in global imbalances.

The rest of the paper is organized as follows: In Section II I analyze the distribution of current account deficits and surpluses during the last 35 years (1970-2004). The analysis focuses on the asymmetries between surpluses and deficits. In Section III I focus on large and persistent current account surpluses, and I inquire whether large surpluses tend to last for prolonged periods of time. In Section IV I analyze the relationship between current account balances and the business cycle. In particular, I ask whether an acceleration in the rate of growth (relative to long term trend) in advanced countries (other than the U.S.) is likely to reduce their surpluses. In Section V I deal with the anatomy of large surplus adjustments. I use data for 35 years and over 100 countries to analyze the most important characteristics of rapid and major declines in current account surpluses. I focus on several aspects of adjustments, including their frequency and distribution across different groups of countries and regions. In this Section I also analyze the concomitant behavior of exchange rates, growth, inflation and interest rates. In particular, I use a battery of non parametric tests to analyze whether the behavior of these key variables has been statistically different in surplus adjustment countries and a control group of countries. Finally, Section VI contains some concluding remarks and discusses directions for future research. The paper also has a data appendix.

II. Current Account Surpluses and the Distribution of Imbalances in the World Economy

A fundamental accounting principle in open economy macroeconomics is that the sum of all current account balances (deficits and surpluses) across all countries in a given year, should add up to zero.[7] However, the fact that the *value* of the sum of all current account balances adds up to zero, does not mean that the *number* of deficit countries should be equal to the *number* of surplus countries. Indeed, it is perfectly possible that

[7] As is discussed in some detail below, during the last few years the actual sum of balances has become significantly different from zero.

the vast majority of countries run deficits, and that only a handful of nations run (rather large) surpluses. In this section I analyze the distribution of current account balances (deficits and surpluses) in the world economy during the last thirty-five years, and I investigate the evolution of this distribution. I am particularly interested in understanding how the increasingly large U.S. – and more generally, Anglo-Saxon – deficit has been financed: is it being financed by an increasingly larger number of countries? How important are surpluses in the emerging countries? What has been the role of commodity-exporting countries?

The data are taken from the World Bank data set and cover all countries – advanced, transition and emerging – for which there is information.[8] In order to organize the discussion I have divided the data into six groups: (1) Africa; (2) Asia; (3) Eastern Europe; (4) Industrialized (or advanced) nations; (5) Latin America and the Caribbean; and (6) Middle East and Northern Africa. The data set covers 160 countries during the 1970-2004 period. There are over 4,200 observations, and it is the largest data set that can be used in empirical work on current account balances. Table A.1 in the Appendix presents a summary on data availability on the current account, both for the complete sample as well as for the different groups of countries. In most of the empirical exercises that I report in the rest of this paper I have restricted the data set to countries with population over half a million, and income per capita above $ 500 in 1985 PPP terms. Also, the analysis presented in this paper is (mostly) carried out using data on current account balances as a percentage of GDP; in what follows positive numbers refer to a current account *surplus*, while negative numbers refer to *deficits*.

Tables 1 and 2 summarize the basic data on current account imbalances during the last thirty-five years. Table 1 contains data on average balances, while Table 2 presents data on median balances. Several interesting results emerge from these tables.

- During the period under study current account balances in Asia have experienced a deep change. As may be seen, until 1998 both the mean and median reflected the fact that most countries in that region posted large current account deficits. Another way of saying this is that until that year

[8] When data from the IMF's *International Financial Statistics* are used the results are very similar.

the Asian nations had positive foreign savings. As these tables show, things changed drastically after the 1997-98 Asian debt crisis. For the period 1990-1995 the mean current account balance in Asia was a *deficit* of 3.3% of GDP. For 1999-2004 the mean current account balance was a surplus of 2.4%. This represents a remarkable *current account reversal* in excess of 5% of GDP!

- Current account balances also experienced important changes in most other country groups. In the Middle East, there have been surpluses, on average, since 1999. These have become more accentuated during 2005-06, as a result of the higher oil prices.
- The magnitude of the external adjustment in the Latin American countries is particularly noticeable from the data on the median balances (Table 2). As may be seen, the current account deficit declined from 5.3% of GDP in 2002 to barely 1.0% of GDP in 2004.
- The data in Tables 1 and 2 also show a difference in the mean and median behavior in the advanced countries. During the last few years the mean current account over GDP balance has been a small surplus – below 1% -- in the industrial nations. On the other hand, the media balance in 2003 and 2004, was a small deficit.

As pointed out above, even though the *value* of all current account balances has to add up to zero, there is no reason why the *number* of deficit countries should be equal to the *number* of surplus countries. Table 3 contains data on the proportion of countries with current account surpluses in each year. This Table shows an important asymmetry between surpluses and deficits: many more countries run deficits than surpluses. Indeed, for the complete sample, only 27.6% of countries experienced surpluses. However, the percentage of surplus countries has changed significantly through time: during 2003 and 2004, this proportion has been 38.6% and 37.8%. As may be seen from table 3, these are the highest figures in the last 25 years, and indicate that the growing U.S. deficit has been financed by an increasingly larger array of countries. Interestingly, the last time the U.S. experienced large deficits (1985-1987), the proportion of surplus nations was much

lower, ranging from 25.0% to 27.9%. In many ways this is not surprising, as the magnitude of the U.S. deficit has been significantly larger during the last few years than in 1985-87. As Table 3 shows, the main difference between these two periods refers to the Asian countries: in 1985-87 less than 25% of the Asian nations run a current account deficit; in 2002-04 almost 70% of the Asian nations run a surplus.

It is important to notice that the results discussed above don't say anything regarding causal relationships. It is not possible to know if the number of surplus countries has increased because there is a need to finance an ever growing U.S. current account deficit, or if the U.S. deficit has expanded because the number of surplus countries has grown during the last few years.[9] As pointed out above, the sum of all current account balances should add up to zero. However, since these balances are gathered by independent country agencies, there is bound to be a statistical discrepancy. In fact, it would be highly unlikely that for any given year the sum of these balances would be actually identical zero; there is bound to be a (small) statistical discrepancy. In the last few years, however, the size of the statistical discrepancy has been growing and since 1997has become increasingly negative (IMF, 2005). According the 2003 *World Economic Outlook* by 2002 the (negative) discrepancy exceeded 3% of the world's imports. This might be called "the mystery of the missing current account surpluses." Marquez and Workman (2001) have argued that this may reflect a number of factors, including: (a) cross country differences in the lags with which actual transactions are recorded; (b) asymmetric valuations of the same transaction in the two countries involved; and (c) misreporting of investment income.

III. High and Persistent Large Current Account Surpluses

According to modern intertemporal models of the current account, including the portfolio-based models of Obstfeld and Rogoff (1996), Kraay and Ventutra (2000, 2002) and Edwards (2002, 2004), countries will tend to experience short-term deviations from

[9] Bernanke's (2005) view on the "global savings glut" assumes that the causal relationship goes from higher national savings in the rest of the world to a U.S. increased deficit.

their long run *sustainable* current account levels.[10] This implies that large current account imbalances – or large deviations from sustainability -- should not persist through time. Once the temporary shocks that trigger the large imbalances have passed, the current account will return to its long-run sustainable level. In this Section I use the data set described above to analyze the degree of persistence through time of large current account surpluses. I am particularly interested in finding out whether some countries have experienced very high surpluses for long periods of time.

As a first step I constructed two measures of *"high surpluses."* (I also constructed equivalent measures of *"high deficits."*)

- *"High Surplus 1:"* This index takes the value of one if, in a particular year, a country's surplus is among its region's 25% highest surpluses. The index takes a value of zero otherwise.
- *"High Surplus 2:"* This index takes the value of one if, in a particular year, a country's surplus is among its region's 10% highest surpluses. It takes a value of zero otherwise.

In Table 4 I list those countries that have had *persistently* high surpluses. I define *persistently* high surpluses as a situation where the country in question has a *high surplus* as defined above for *at least four years in a row*. The first column in Table 4 refers to *High Surplus 1* while the second column refers to *High Surplus 2*. As may be seen, there are 35 countries with persistently high surpluses according to the *"High Surplus 1"* definition, and only 12 according to the more stringent *"High Surplus 2"* definition. Some interesting facts emerge from these tables (in what follows I focus on the *"High Surplus 1"* definition in Column 1).

- First, the number of *large* countries that have had persistently large surpluses is very small. Only Germany and Japan make the list, among

[10] In these models changes in current account balances are (largely) the result of efforts by domestic economic agents to smooth consumption. The sustainable level of the current account balance, in turn, will depend on portfolio decisions both by foreigners as well as by domestic investors.

the advanced nations, and China and Russia among the emerging and transition countries.

- Many oil producing countries are in the list of *persistently* high surpluses. This is particularly the case in the years following a major oil price increase.
- Many East Asian countries have had persistently large surpluses in the aftermath of the 1997-1998 debt crisis.
- Only a handful of countries have been truly long term high surplus nations. The most important ones are Switzerland and Singapore.

Overall, the picture that emerges from Table 4 has two implications. First, the fact that large countries don't seem to run high surpluses in a very persistent way, is consistent with the notion that in order to finance the increasingly large U.S. deficit, more a more small and medium size countries have to run surpluses. And second, the lack of persistency suggests that the majority of countries that do run large surpluses, only do it for a rather limited period of time. After posting these large surpluses they go through an adjustment process that reduces their surpluses to more "normal" – or sustainable – levels. An important question – and one that I address in Section V of this paper – refers to the nature of these *"surplus adjustment"* episodes: from a historical point of view, have these adjustments been gradual or abrupt? Other relevant questions from a policy perspective include: what has been the evidence on the behavior of other key macroeconomic variables during the adjustment? During a surplus adjustment, do macro variables such as inflation, interest rates, exchange rates and growth, behave differently than in non adjustment countries?

III.2 The Persistence of High Surpluses: Some Econometric Results

In order to investigate further the degree of persistence of high current account imbalances I estimated a number of variance component *probit* regressions of the following type:

$$(1) \qquad High_{jt} = a + \sum b_k High_{jt-k} + gX_{jt} + e_{jt}$$

Where $High_{jt}$ is a dummy variable that takes a value of 1 if country j has a *high surplus* (as defined above) in period t; X_{jt}, refers to other covariates including time, country and/or region fixed effects. The error term e_{tj} is given by a variance component model: $e_{tj} = n_j + m_{tj}$. n_j is iid with zero mean and variance s_n^2; m_{tj} is normally distributed with zero mean and variance $s_m^2 = 1$. My main interest is on the b_k coefficients on lagged high surpluses: I am interested in finding out whether having had a high surplus in the past (up to four years) affects the probability of having a high deficit in the current period. An important question is whether the degree of persistence is similar for *high surpluses* and *high deficits.* In order to address this issue I also estimated equations such as (1) for deficit countries. [11] The results are in Table 5, where I report the estimated *marginal effects*, which capture the change in the probability of a high surplus (deficit) in period t, if there is a high surplus (deficit) in period t-k.[12]

As may be seen, these results suggest that the degree of persistence of *high deficits* is larger than that of *high surpluses*; this is particularly the case for the stricter definition of high imbalances *High 2*. These results show that beyond the first lag, the point estimates of the marginal effects are very small, and that in many cases they are not statistically significant. This confirms the results in Table 4 that indicate that during bthe last 35 years the degree of persistence of high imbalances has tended to be low.

III.3 Large and Persistent Surpluses in Absolute Terms

The results presented above on persistently high deficits were constructed on the bases of current account balances to GDP ratios. From a global financing perspective, however, what really matters is which countries have large deficits measured in convertible currency. Table 6 contains data on countries with *persistently high surpluses*, measured in absolute terms. As may be seen, this table has some important differences with Table 4 on surpluses measured as a proportion to GDP. As expected, in Table 6 there is a greater presence of large countries: France and Italy are now "highly persistent

[11] The variables *"High Deficit 1"* and *"High Deficit 2"* where computed in a symmetric way to the two high surpluses variable.

[12] The marginal effects dF/dx in Table 5 have been computed for a discrete change in the dummy variables from 0 to 1, and have been evaluated for the mean values of all the regressors. In addition to these panel probits I also estimated dynamic linear probability models and dynamic panel probits (Heckman 1981). The results obtained support those presented here.

surplus" countries; also, Japan's streak of high surpluses appears to be much longer than in Table 4. But the most important difference between both tables is that according to Table 6, China has run a persistently high surplus for more than a decade. This suggests that an adjustment in China's large external surplus will be an important component in solving current global imbalances.

IV. Current Account Surpluses and the Business Cycle: Will an International Growth Realignment help solve Global Imbalances?

One of the basic macroeconomic relationships – and one that is taught early on to undergraduate students – is that the current account is the difference between savings and investments. This means that countries that experience an investment boom will go through a deterioration of their current account. Likewise, countries that experience an increase in savings will tend to post larger surpluses. Of course, this savings-investment perspective is complementary to the more popular one that focuses on trade flows, net incomes from abroad and international net transfers. The advantage of focusing on the savings-investment relationship is that it allows analysts to focus on the way in which changes in aggregate demand – and changes policies that affect aggregate demand, for that matter -- will affect current account balances.

A practical implication of the savings-investment perspective – and one that has played an important role in recent debates on global imbalances – emphasizes the role of differences in regional rates of growth on current account balances. As pointed out above, the analysis runs along the following lines: During the last few years rapid growth in the U.S. has been associated with an increase in U.S. investment (over savings); on the other hand, slower growth in Europe and Japan has been associated with higher savings (relative to investment) in those parts of the world.[13] According to this view, global imbalances are, to a large extent, a reflection of these growth differentials. Thus, far from reflecting a serious problem, the large current account deficits in the U.S. are a sign of strength; they reflect the fact that during the last few years the U.S. has been the locomotive of global growth. An implication of this perspective is that, an international

[13] Notice that this argument is very general, and refers to the relationship between investment, savings and growth; in fact, no causality is implied there is in the above statement.

realignment of growth – with an increase in growth in Europe and Japan and a slowdown in the U.S. – would play an important role in correcting global imbalances.[14] In a 1999 article, the *Financial Times* summarized the IMF's ***World Economic Outlook*** views on global imbalances as follows (emphasis added):

> "Current account imbalances between the world's three main economic blocks have widened in recent years, *reflecting stronger growth in the US economy than in Japan and Europe*."[15]

In a 2004 speech, then Under Secretary of the Treasury John B. Taylor discussed the relationship between savings, investment, growth differentials and global imbalances. According to him (emphasis added):

> "[The] increase in investment was a key factor in *U.S. economic growth* during this period. Over a longer period the increase in investment will expand the capital stock… [T]he increase of the U.S. current account deficit over more than a decade has been linked to domestic U.S. capital formation increasing more than U.S. saving…" (Taylor 2004)

Regarding the correction of global imbalances, in the same speech Taylor said that there was a need to boost global growth:

> "We would certainly not object - in fact, we'd be very pleased - if other countries strengthened their investment environment, their level of investment, and their *economic growth performance*. [Pro growth] policies are those that will raise global growth…[and] will ameliorate the deficit by raising U.S. exports and increasing investment opportunities around the globe… *[M]ore growth*

[14] Implicit in this view is the notion that growth realignment would require higher savings (and/or lower investment) in the U.S. and higher investment (and/or lower savings) in Europe and Japan (and maybe in other parts of non-China Asia).

[15] See, Robert Chote, "IMF: US Slowdown Now Inevitable," *Financial Times*, April 21, 1999.

> *throughout the world …[will] reduce external imbalances*." (Taylor 2004, emphasis added).

In a 2004 article, former IMF's Chief Economist Michael Mussa wrote:

> "With respect to the necessary correction of the U.S. current account deficit, *acceleration of growth in the rest of the world* and the depreciation of the U.S. dollar since 2001 should help to bring an end to further increases in the U.S. imbalance." (Mussa 2004, emphasis added).

Many authors have addressed the question of whether large external imbalances are worrisome by investigating whether they are consistent with intertemporal optimizing models that posit that savings and investment decisions -- and thus the current account -- are the result of *optimal* decisions by the private sector. If the data support the intertemporal model, observed current account balances (even very large balances) are the reflection of optimal decisions and, thus, they should not be a cause for concern. An important and powerful implication of intertemporal models is that, at the margin, changes in national savings should be fully reflected in changes in the current account balance (Obstfeld and Rogoff 1996). Empirically, however, this prediction of the theory has been systematically rejected by the data.[16] Typical analyses that have regressed the current account on savings have found a coefficient of approximately 0.25, significantly below the hypothesized value of one. Many numerical simulations based on the intertemporal approach have also failed to account for current account behavior. According to these models a country's optimal response to negative exogenous shocks is to run *very high* current account deficits, indeed much higher than what is observed in reality. Obstfeld and Rogoff (1996), for example, develop a model of a small open economy where 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.[17] The

[16] See, for example, Aizenman (1983), Ogaki, Ostry and Reinhart (1995), Gosh and Ostry (1997), and Nason and Rogers (2006).

[17] 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.

common rejection by the data of the intertemporal (or Present Value) model of the current account has generated an intense debate among international economists. Some have argued that there is a group of "usual suspects" that explain this outcome (Nason and Rogers 2006); others have argued that the problem resides on the low power of traditional statistical tests (Mercereau and Miniane 2004). In a series of recent papers Kraay and Ventura (2000, 2002) and Ventura (2003) have proposed some amendments to the traditional intertemporal model that go a long way in helping bridge theory with reality. In their model portfolio decisions play a key role in determining the evolution of the current account balance. When investors care about both return and risk, changes in savings will not be translated into a one-to-one improvement in the current account. In this case investors will want to maintain the composition of their portfolios, and only a proportion of the additional savings will be devoted to increasing the holdings of foreign assets (i.e. bank loans). In addition, they argue that when short run adjustment costs in investment are added to the analysis, the amended intertemporal model traces reality quite closely. In this setting the behavior of countries' net foreign assets play an important role in explaining current account behavior. In particular, and as pointed out by Lane and Milesi-Ferreti (2002, 2003), changes in foreign asset valuation stemming from exchange rate adjustments will tend to affect the adjustment process and the evolution of current account balances.

Intertemporal-based models of the current account don't generate clear-cut predictions on the relation between growth (or deviations of growth from long term trend) and the current account balance. Generally speaking, the relationship may be positive or negative, depending on the source of the shock that affect growth.[18]

In this Section I take a somewhat different approach to analyzing the determinants of the current account, and the mechanisms through which current global imbalances are likely to be solved. Instead of testing whether the implications of the present value model of the current account hold for a particular set of countries, I use panel data to investigate the relationship between the business cycle and the current account. In particular, I ask how sensitive have current account balances been to expansions (contractions) in real GDP growth relative to its long term trend in different countries. I also investigate the

[18] See, for example, Obstfeld and Rogoff (1996) and Kraay and Ventura (2000).

way in which current account balances have been affected by terms of trade shocks, fiscal imbalances, changes in the real exchange rate, and the country's net external position or net international investment position. In principle, this analysis should throw light on the extent to which an expansion that propels growth closer to its long term trend – or, for that matter, above this trend – in Europe and Japan, will affect global imbalances. The analysis also allows us to have an idea on the long run relationship between a country's net external position and its current account balance.[19]

IV.1 The Empirical Model

The point of departure of the empirical analysis is the notion that, in the long run, a country's current account balance (relative to nominal GDP) should be at its *sustainable* level. Modern analyses of current account sustainability are based on the notion that in equilibrium the ratio of the net external position (NEP) to GDP (or to some other aggregate) has to stabilize at some level.[20] The relationship between the equilibrium and stable ratio of NEP to GDP – which I will denote as g – and the sustainable current account to GDP balance (*SCA*) may be written as follows:[21]

$$SCA = g\,(g^T + p), \tag{2}$$

where $(g^T + p)$ is the nominal rate of growth of trend GDP; g^T is the long run trend real rate of growth of GDP, and p is the long run steady-state inflation rate. If a country's equilibrium NEP to GDP ratio is negative, then the country is said to be a "net debtor," and will run a current account deficit. If, on the other hand, the country is a global "net creditor," g will be positive, and the country will run a sustainable current account surplus.[22] Current account regressions, then, should incorporate this "sustainability" condition and provide estimates on the long run relationship between the current account

[19] Recent attempts at estimating current account regressions for a panel of countries include Calderon, Chong and Loayza (2002), , Chinn and Prasad (2003), Chinn and Lee (2005), Chinn and Ito (2005), and Gruber and Kamin (2005).

[20] See Milesi-Ferreti and Razin (1996) and Edwards (2005).

[21] See Edwards (2005) for a detailed analysis along these lines that incorporates the dynamic effects of changes in g .

[22] In rigor the net international investment position refers to all assets and liabilities held by non-nationals. In that sense, the concept includes equities, and FDI, and goes beyond debt. It is for this reason that in the paragraph above "net debtor" and "net creditor" are in quotation marks.

balance and the NEP to GDP ratio. The empirical analysis presented in this Section is based on the following two-equation formulation:

(3) $$CA_{jt} = a_0 + a_1\left(g_j^T - g_{jt-1}\right) + fNEPGDP_j^* + \sum b_i Xi_{jt-k} + e_{jt}$$

(4) $$g_j^T = y + \sum d_i Zi_j + \sum q_i Vi_j + x_j .$$

Where the following notation was used:

- CA_{jt} is the current account balance relative to GDP, in country j in year t (a positive number denotes a current account surplus).
- g_j^T is country *j*'s long term trend rate of growth per capita, and g_{jt-1} is country *j*'s actual rate of growth per capita in period t-1.
- Thus, the term $(g_j^T - g_{jt-1})$ is a measure of the growth gap: if the country in question is growing below trend this term is positive, and if it is expanding at a rate that exceeds the long term trend, its sign will be negative. This term captures the effect of the business cycle on the current account balance, and is of particular interest for the issues discussed in this paper. If, economic activity slows down, $(g_j^T - g_{jt-1})$ will become positive. There are, of course, many reasons for $(g_j^T - g_{jt-1})$ to be positive or negative. The formulation in equation (3) does not distinguish between the specific factor driving $(g_j^T - g_{jt-1})$. In that sense, this analysis is very general. In long run equilibrium, however, $(g_j^T - g_{jt-1}) = 0$. An important question refers to the sign of coefficient a_1. If, as argued by the policy makers, analysts and scholars cited above, an acceleration in growth (relative to long term trend) results in a deterioration of the current account balance, the estimated coefficient of $(g_j^T - g_{jt-1})$ – the coefficient a_1 – will be positive. In equation (3) – as in

most panel data equations – the coefficients are common for all regions/countries. In Section IV.4 on robustness, however, I present results where I allow some of the coefficients to differ by region.

- $NEPGDP_j^*$ is a measure of the equilibrium (long run) ratio of country's *j*'s net external assets (or NIIP) to GDP. It will be positive if the country is a "net global creditor," and negative if it is a "net debtor." In the estimation of equation (3) its coefficient should be positive; it will capture the long run relationship between NEP and the sustainable current account balance. The way this variable is constructed in the empirical analysis is explained in detail below.
- The variables Xi_{jt-k} in equation (3) are other determinants of the current account, such as: (a) changes in the real exchange rate: (b) the fiscal balance over GDP: and (c) changes in the international terms of trade. These Xi_{jt-k} are defined in a way such that in long run steady state equilibrium their value is equal to zero.
- The error term e_{tj} is given by given by: $e_{tj} = n_j + m_{tj}$. n_j is an iid country-specific disturbance with zero mean and variance s_n^2; m_{tj} is normally distributed with zero mean and variance $s_m^2 = 1$.

Equation (4) is the equation for the long run (trend) rate of growth of real GDP. The Zi_j are economic determinants, while the Vi_j are institutional determinants of long term growth. x_j is an error term assumed to be heteroskedastic. In determining the specification of (4) I followed the standard literature on growth (Barro and Sala-i-Martin, 1995).

An important property of the model in equations (3) and (4) is that, since in the long run equilibrium $(g_j^T - g_{jt-1}) = 0$, and the $Xi_{jt-k} = 0$, it follows that:

(5) $$CA_j^{LongRun} = a_0 + fNEPGDP_j^*.$$

This is, indeed, an estimate of the long run sustainable current account balance. If the model given by equations (3) and (4) is estimated for different groups of countries, the estimated f coefficients will help provide an estimate for the *sustainable* current account balance, for different values of $NEPGDP_j^*$. Also, the estimated value of f is the average value of $(g^T + p)$. In the base run I estimate a common f; in Section IV.4, however, I report different f for different regions.

The specification in equations (3) - (4) differs from recent papers on current account behavior in several ways. The most important difference with Chinn and Prasad (2003) and Chinn and Ito (2005) is that in the current paper the long run current account balance does converge in the long run towards $fNEPGDP_j^*$. Another difference is that while in this paper I have included the deviations of (per capita) growth from long term trend, Chinn and Prassd (2003) and Chinn and Ito (2005) focus on average growth. Chinn and Ito (2005) incorporate governance and institutional variables directly into the estimation of the current account balance; in this paper, in contrast, institutional variables play a role through the long run value of $NEPGDP_j^*$. Another recent paper similar in spirit to this one is Gruber and Kamin (2005). As Chinn and Ito (2005), Gruber and Kamin (2005) incorporate institutional variables directly into the estimation of their current account equations. Also, Gruber and Kamin (2005) include dummy variables for crisis periods. Another important difference between this paper and Gruber and Kamin (2005) refers to the growth terms: in equation (3) the relevant growth variable is deviations of growth from trend, while in Gruber and Kamin (2005) it is the change in per capita growth differentials.

IV.2 Estimation and Basic Results

I estimated the system (3) - (4) using a two step procedure. In the first step I estimated the long run growth equation (4) using a cross-country data set. These data are averages for 1974-2004, and the estimation makes a correction for heteroskedasticity. First stage estimates are then used to generate long-run predicted growth rates to replace g_j^T in the current account equation (3). In the second step, I estimate equation (2) using both random effect and fixed effects methods. In estimating equation (3) for long-run per

capita growth, I followed the by now standard literature on growth, as summarized by Barro and Sala-I-Martin (1995), and use average data for 1974-2004. In terms of the equation specification, I also follow Barro and Sala-I-Martin (1995), Sachs and Warner (1995) and Dollar (1992) among others, and assume that the rate of growth of GDP (g_j^T) depends on a number of structural, policy and social variables. More specifically, I include the following covariates: the log of initial GDP per capita; the investment ratio; the coverage of secondary education; an index of the degree of openness of the economy; the ratio of government consumption relative to GDP; and regional dummies for Latin American, Sub Saharan African and Transition economies. The results obtained in this first step estimation of the long run growth equations are not reported due to space consideration; they are available on request.

The empirical definition of $NEPGDP_j^*$ in equation (3) poses an interesting challenge. Conceptually this variable is the equilibrium, or desired, long term ratio of country *j's* net external position relative to GDP. It is not trivial, however, to obtain data on this "desired" ratio. In the basic specification I proxied $NEPGDP_j^*$ by the mean value of the actual ratio of the net external position to GDP for the period 1970-2004. In order to check for the robustness of the results, in Sub-Section IV.3 I report regression estimates using alternative definitions of $NEPGDP_j^*$.

Following the empirical literature on the current account, the following Xi_{tj} covariates were included in the estimation of equation (3), (see the Appendix for data sources):

- A terms of trade shock defined as the percentage change of the relative price of exports to imports. A positive (negative) number represents an improvement (deterioration) in the terms of trade. This variable is introduced lagged one period. Its coefficient is expected to be positive, indicating that a positive terms of trade shock results in an improvement in the current account balance.
- The accumulated percentage change in the real exchange rate in a three-year span, lagged one period. The real exchange rate is defined in a way

such that a positive change represents a real exchange rate depreciation. The coefficient is expected to be positive: a real depreciation results in a higher (lower) surplus (deficit).

- The ratio of the public sector deficit to GDP, lagged one period. It is expected that its coefficient will be negative.
- In order to check for robustness, alternative specifications and variables definitions were considered. The results obtained are reported in Sections IV.3 and IV.4 below, and show that the main findings from the base run are not affected in a significant way.

In the regression analysis reported in this Section I focus on mid size and large countries; these are defined as countries with a GDP in 1995 of at least USD 52 billion.[23] The sample includes 41 countries over the period 1974-2004. Of these, 20 are advanced nations and 21 are emerging or transition countries. The size of the sample was determined by data availability; not all countries had data for all variables (See the appendix for a list of countries). I estimated equation (3) for three alternative samples within the "large countries" group: advanced, non-advanced and all countries.

The base estimates are presented in Table 7, where the first three columns are for the random effect results and the last three columns are for the fixed effect estimates. Robust standard errors were used to estimate the z-statistics. As may be seen, all the estimated coefficients have the expected signs and the vast majority is significant at expected levels. Moreover, the estimated coefficients are very similar for the random and fixed effect results. The point estimates for the coefficient of $(g^T + p)$ are very similar across sample and estimation technique, and range from 0.180 to 0.225. These estimates indicate that, with other things given, a decline in the rate of growth of GDP per capita of, say, 1 percentage point below long term trend, will result in an increase in the current account surplus of at most one quarter of a percent point of GDP. These results have interesting implications for the analysis of "global imbalances." As an illustration, consider the case of Japan: according to my estimates, during 2003-2004 Japan's per capita growth was, on average, 3.3 percentage points below trend. This implies that, had

[23] Below I discuss the results obtained when all countries – large and small – are included in the sample.

Japan growth been on trend, its current account surplus would have been between 0.54% of GDP and 0.68% of GDP *lower* than what it actually was. During 2003-04 GDP growth was also below trend in other large industrial countries: In Germany, during 2003-2004 growth was 1% below trend; in France it was 0.6% below trend, and in Italy growth was 1% below trend. In Section IV.5 I present a more detailed analysis of the effects of a realignment of growth national rates on global imbalances.

The estimates in Table 7 also imply that improvements in terms of trade result in larger (smaller) surpluses (deficits); this effect is particularly clear in the advanced countries. An accumulated real depreciation also improves the current account balance. The point estimates of this coefficient are significantly higher for the emerging and transition countries than for the advanced nations. A higher public sector deficit, on the other hand, tends to reduce the current account surplus, or increase the deficit.

The coefficients of $NEPGDP_j^*$ are positive, as expected, and significant (Since $NEPGDP_j^*$ is, for each country, constant across time, its coefficient cannot be estimated using fixed effects). The estimated coefficients of $NEPGDP_j^*$ range from 0.064 to 0.070, and are similar for the advanced nations and the emerging and transition countries. The results in this Table suggest that for advanced countries with long run net asset position of 30% of GDP the sustainable current account balance is a surplus 1.9% of GDP.[24] On the other hand, these results suggest that for an (average) emerging nation with a *negative* net external position of 40% of GDP – that is, $NEPGDP_j^* = -40$ – the long run sustainable deficit will be, on average, equal to 1.1% of GDP.[25]

IV.3 Alternative Definitions of $NEPGDP_j^*$

The results presented in Table 7 were obtained when the long run equilibrium $NEPGDP_j^*$ was proxied by the average ratio of net external assets to GDP over the sample period. In this Sub-Section I report results obtained when an alternative measure of $NEPGDP_j^*$ is used. To generate this new variable I followed a two-step procedure:

[24] This assumes that all other variables are given at their mean. They use the point estimate for advanced nations in Table 7.

[25] Remember that the sustainable surplus/deficit includes the intercept. These computations assume that in the long run the fiscal deficit is equal to zero. If alternative assumptions are made, the calculated sustainable balances will be different.

First, I used long term averages to estimate a cross-section equation for $NEPGDP_j^*$. In the second step, I used the predicted values obtained from this equation as estimates of $NEPGDP_j^*$. In estimating the cross section equation, the dependent variable is the actual 1970-2004 average of the net external position for each country. In specifying the equation I considered the following covariates:[26] (a) The degree of trade openness, measured as exports plus imports over GDP. Its coefficient is expected to be positive. (b) The ratio of government consumption to GDP. I expect its coefficient to be negative. (c) A dummy variable for commodity exporting countries (including oil exporters). (d) A measure of political stability, captured by an index of civil liberties. (e) The average rate of growth of GDP per capita. (f) A measure of the degree of financial openness, calculated as the sum of total external liabilities and total external assets (these include debt, equities, FDI and international reserves) relative to GDP. I expect its coefficient to be positive. (g) Inflation, measured as the average percentage rate of change of CPI; its coefficient is expected to be negative. (h) Initial level of GDP per capita, its coefficient is expected to be positive. And (i) regional dummy variables.

The results obtained from the estimation of this long run cross country regression of the net external position, for a sample of 130 countries are reported in Table 8; the first column excludes regional dummies, while the second column includes them. As shown by the between R^2, the fit is quite good Moreover, many of the coefficients are statistically significant and have the expected signs. Whether a country is a commodity exporter doesn't appear to affect the (average) level of NEP over GDP. Interestingly, there is no evidence that countries with a faster average rate of economic growth have a higher NEP over GDP ratio.

I used the estimates in Column 2 of Table 8 to generate predicted values of $NEPGDP$ that include estimates of the country specific error component. I call this variable *NEPGDP_STAR*, and I used it as a proxy for $NEPGDP_j^*$ in a series of regressions for the current account equation (3). The results obtained when a random effects procedure was used are in Table 9; z-statistics were computed using robust

[26] For estimations along these lines see, for example, Lane and Milesi-Ferreti (2005, 2006). Aizenman and Noy (2004) argue that the degree of openness is an important determinant of countries; external position.

standard errors. As may be seen, the overall results are similar to those reported in Table 8: all coefficients have the expected signs and most of them are significant at conventional levels. Interestingly, the estimated coefficients of *NEPGDP_STAR* are lower tyahn those obtained when the average NEP to GD ratio was used (See Table 7). The difference between these two coefficients is particularly marked for the emerging and transition countries: 0.070 in Table 7, vs 0.011 in Table 8. This implies that according to Table 8 the (average) sustainable current account balance for the emerging and transition countries is smaller than what was previously suggested. A possible interpretation for this result – and one that I investigate in Sub Section IV.4 – is that this aggregate estimate is averaging (very) different estimates for the different regions.

An important result from the perspective of the discussion on global imbalances is that the estimates of the coefficients for $(g_j^T - g_{jt-1})$ in Table 9 are similar to those reported above, and support the view that current account balances have been quite sensitive to the business cycle.

IV.4 Potential Endogeneity and Other Robustness Checks

In this Sub Section I deal with potential endogeneity issues and I report the results from a number of robustness checks. As will be seen, the main results reported above stand up to this scrutiny.

Potential endogeneity: One of the covariates in the current account equation (3) is the (lagged) accumulated change in the real exchange rate. It is possible that this variable will be influenced by the perceived (future) evolution of the current account.[27] In order to deal with this potential source of endogeneity I re-estimated equation (3) using an instrumental variables random effects procedure. The following instruments were used: an index that measures the proportion of countries in the country's region that were subject to a sudden stop in capital inflows, lagged one period; a similar index that measures the incidence of sudden stops in other regions, also lagged one period; two periods lagged changes in terms of trade; two periods lagged inflation; initial (1970) GDP per capita; population growth and regional dummy variables. The results obtained from this instrumental variables random effects estimation are reported in Table 10. As may

[27] Since the change in the RER is lagged one period, it is a predetermined variable. However, if there is serial correlation, it may still be correlated with the error term.

be seen, in most respects the results are very similar to those reported above. Particularly important for the purpose of this discussion in this paper, the estimated coefficients of $NEPGDP_j^*$ and $(g_j^T - g_{jt-1})$ continue to have the expected positive sign and to be significant. Also, their point estimates are quite similar to those reported above. The most important difference between the instrumental variable random effect estimates in Table 10 and those in Tables 7 and 9 is that the coefficient of the accumulated change in the RER is not any longer significant for advanced countries. A possible interpretation for this result is that the measure of rela exchange rate changes is a poor proxy for real exchange rate misalignment.

Alternative samples: I also estimated the model in equations (3) and (4) for alternative samples; the detailed results are not rep[orted here due to space considerations. Interestingly, for a sample of smaller countries, the point estimate of the $(g_j^T - g_{jt-1})$ variable is significantly smaller, although still significant. Other sample variations, including the elimination of "outliers" did not alter the main results in significant ways.

Alternative specifications: I considered alternative specifications for the current account equation (3). In particular, instead of the accumulated change in the RER, I used a variable that captures the deviation of an estimate of the "equilibrium" RER and the one period lagged actual RER. I also modeled in greater detail the mechanics of the dynamic adjustment of the current account. In both cases the results obtained are similar to those reported above; these results are available on request.

Region-specific coefficients: The results reported above were obtained under the assumption of common coefficients for all countries. This, of course, needs not be the case. In this Sub-section I report the results obtained when different regional coefficients are allowed for $NEPGDP_j^*$ and $(g_j^T - g_{jt-1})$. This is done by interacting regional dummies with these two variables. The results are reported in Table 11. As may be seen, the coefficients for the different variables continue to have the same signs as in the previous tables, and continue to be significant at conventional levels. Notice, however, that the point estimate of $(g_j^T - g_{jt-1})$ is somewhat smaller than what was reported earlier. Two of the regional dummies interacted with $NEPGDP_j^*$ are significant: for

Latin America and Asia. Interestingly, the results in Table 11 suggest that the coefficient of net external assets for the Latin American region is not different from zero; the c^2 test has a value of 0.29 and a p-value of 0.58. The coefficient of net external assets interacted with the Asia dummy is 0.039 and significant. This implies an overall coefficient for Asia of 0.095.

The estimate in Table 11 also includes terms that interact regional dummy variables with $(g_j^T - g_{jt-1})$. As may be seen, the interactive terms for Asia and Africa are significant at conventional levels. Their point estimates suggest that the sensitivity of the current account to changes in growth relative to trend is higher in these two regions than in the rest of the world.

Interacting growth deviations with net external assets: An interesting question – and one that has been explored by Kraay and Ventura (2000) – is whether the effects of different shocks – including shocks to growth – on the current account depend on the country's net external position. In order to explore this possibility I included in the estimation of equation (3) a variable that interacts $(g_j^T - g_{jt-1})$ with the (twice lagged) ratio of net external assets to GDP. The estimated coefficient was negative --- as suggested by Kraay and Ventura (2000) --, but it was not significant at conventional levels. The results are not reported, but are available on request.

IV.5 Would Growth Realignment in Japan and the Euro Zone be enough to Correct Current Global Imbalances?

As pointed out above, many analysts and government officials have argue that a realignment of regional growth – with Japan and the Euro Zone growing faster and the U.S. moderating its rate of growth – would contribute significantly towards solving current global imbalances. In this Sub-Section I use the econometric estimates reported above to investigate the extent to which global imbalances would be reduced if growth moved towards a more "normal" level in a number of key countries. In particular, I assume that per capita growth increases in the Japan and Germany, two countries with the second and third largest surpluses in 2005, and that posted a combined surplus of USD 270 billion that year. More specifically, I assume that Japan's growth increases by 3.3% relative to its 2003-04 average, while Germany's growth increases by 1%. These higher

growth rates would put both of these countries back onto their long term growth trends. In addition, I assume that France and Italy, two countries that posted small deficits in 2005, increase their growth by 1% each.[28]

Using the estimated coefficients from the equations in Table 7, the acceleration in growth in Japan and the most important Euro countries would result in a surplus reduction of merely USD 40 billion. Of these, USD 27 billion correspond to surplus reduction in Japan, and USD 13 billion to surplus reduction in the Euro zone. What will happen if U.S. growth declines towards its long term trend? According to my estimates, this would result in a decline in the deficit of USD 23 billion.

The magnitude of these corrections is quite small when compared with the type of adjustment that many analysts believe is required. Indeed, if the "sustainable" current account deficit in the U.S. is 3.6% of GDP, the needed correction would add up to approximately USD 350 billion. These results suggest, then, that without a significant adjustment in China and the oil exporting countries, global imbalances will not be corrected. Moreover, these results support the view that (significant) exchange rate realignments will be needed to correct global imbalances.[29]

V. The Anatomy of Major and Rapid "Surplus Adjustments": Lessons from Thirty Five Years of History

Since the mid-1990s a number of authors have analyzed episodes of *sudden stops* of capital inflows and *current account reversals*.[30] These studies have focused on the abrupt decline of international financing and the resulting rapid turnaround in the current account, from a large deficit to a moderate one (or, even, to a surplus). Until now, there have been no equivalent studies on episodes of large and sudden adjustments in surplus countries. The purpose of this Section is to fill this void, and analyze the anatomy of "surplus adjustment" episodes, or large reductions in current account surpluses during short periods of time. In particular, I am interested in analyzing how a number of key macroeconomic variables – including inflation, GDP growth, interest rates and real

[28] Notice that Germany, France and Italy's GDP add up to the bulk of the Euro Zone's GDP.
[29] See Blanchard, Giavazi and Sa (2005), Obstfeld and Rogoff (2005), and Edwards (2005).
[30] For recent papers, see Calvo et al (2004) and Frankel and Cavallo (2004). For capital flows and crises, see Eichengreen (2003).

exchange rates – behave in the period surrounding these *surplus adjustments* or SA. I define "*surplus adjustments*" in two alternative ways:

- *Surplus Adjustment 2%:* Defined as a reduction of a country's current account surplus in at least 2% of GDP in one year. In addition to this requirement, the initial surplus has to be of 3% of GDP or higher.
- *Surplus Adjustment 3%:* Defined as an accumulated reduction of a country's current account surplus in at least 3% of GDP in three years. In addition to this requirement, the initial surplus has to be of 3% of GDP or higher.

Table 12 contains information on the incidence of both definitions of surplus adjustments for the period 1970-2004. The data are for the complete sample, as well as for six groups of countries: advanced, Latin America, Asia, Africa, Middle East and North Africa and Eastern Europe. As may be seen, *"Surplus Adjustment 2%"* has been a more common phenomenon than *"Surplus Adjustment 3%."* The overall incidence for the former is 6.6%; it is only 3.0% for the latter. For both definitions the highest incidence has been in the Middle East and North Africa region with 19.7% and 10.2%. This reflects the important role played by Middle East oil producing countries in the generation of current account surpluses in the last 35 years. Interestingly, the data in Table 12 show that the industrial countries have had the *lowest occurrence* of surplus adjustments in our sample.

V.1 Surplus Adjustment and Exchange Rates

An important policy question – and one that is particularly relevant within the context of current policy debate on global imbalances – is whether surplus adjustment episodes (as defined above) have historically been associated with large exchange rate appreciations.[31] In Figure 1 I present the evolution of the median (bilateral) *real* exchange rate in surplus adjustment countries. These data are centered on the year of the surplus adjustment, and presented as an index with a value of 100 during that year. The indexes

[31] A related question, of course, has been asked of current account reversal episodes. For the relationship between depreciations and crises see Eichengreen et al (1996).

are tracked from three years prior to the current account surplus adjustment to three years after the adjustment.[32] In this Figure a lower value of the index reflects a *real exchange rate appreciation*.[33] There are three panels in this Figure: one for advanced countries, one for large countries – as pointed out above, these are defined as those having a GDP in the top 25% of the distribution in 1995 --, and one for the complete sample. As may be seen from Figure 1, in the "large" and "advanced" countries samples there appears to be a visible real exchange rate appreciation in the period surrounding the surplus adjustment episodes. On the other hand, the figure for "all" countries shows no significant changes in the period around the surplus adjustments episodes.

Figure 2 shows the behavior of the (median) *nominal* effective exchange rate index. As before, a decline in the index is a real appreciation. In this case, the picture is rather mixed. There is a slight nominal depreciation in the "all countries" sample, a small appreciation in the "advanced nations" sample and no clear pattern in the "large countries" sample.

In order to gain further insights on the nature of these surplus adjustment episodes I estimated c^2 statistics to test whether the medians in these figures were statistically different at different points in time. The tests were performed for various comparisons: (a) Three years after the adjustment relative to three years previous; (b) one year after the adjustment relative to one year previous; and (c) three years after the surplus adjustment relative to one year before the adjustment. The results are reported in Table 13a for the *"Surplus Adjustment 2%"* episodes, and in Table 13b for the *"Surplus Adjustment 3%"* episodes. For the RER the null hypothesis of equal medians is rejected in seven out of the nine cases in this Table. According to these computations the magnitude of the RER adjustment may be quite sizable. For instance, for the *"Surplus Adjustment 2%"* episodes the median appreciation between one year before and three years after the adjustment is 12.6% (c^2 =8.25; p-value 0.004).

[32] For the "Surplus Adjustment 3%" episodes, period zero corresponds to the first year of the 3-year adjustment period.

[33] If data for trade weighted RER are used the results are similar. The limitation of using trade-weighted data is that they are available for a smaller number of countries.

V.2 Surplus Adjustments, Interest Rates, Inflation and Real Growth

Figures 3 and 4 present "before" and "after" data for real interest rates and inflation for our two definitions of surplus adjustments. As may be seen, these figures – as well as the data on c^2 statistics in Table 13a and b -- show a small decline in real interest rates, and no significant trend for inflation in the years following the adjustment. Figure 5 presents data for GDP per capita growth during the period surrounding our surplus adjustment episodes. Once again, there is very little action here, and no clear pattern of behavior can be extracted form this analysis. This impression is largely supported by the results from the c^2 tests reported in Table 13a and b.

V.3 Surplus Adjustment and Terms of Trade

An interesting question is whether the surplus adjustment episodes identified in this paper have been associated with a sudden deterioration in the terms of trade. This is investigated in Figure 6. As may be seen, in all three samples there is a worsening in the terms of trade in the year of the adjustment (period 0), relative to the previous year. This deterioration in the relative price of exports is reverted – in some cases partially and in others more than fully – in subsequent years. However, and in spite of these changes in the terms of trade, the data on the formal tests don't support the hypothesis that surplus adjustment episodes have been driven by terms of trade shock (see the c^2 tests in Table 13a and b).

V.5 Are Current Account Surplus Adjustment Episodes Different from Deficit Reversal Episodes?

The picture that emerges in Figures 1- 6 on the evolution of key macro variables in the period surrounding surplus adjustment episodes is not very sharp, and does not provide a clear-cut pattern of behavior. There is some evidence that, as one would expect from theory, there is some real exchange rate appreciation, a slight decline in real interest rates and, a short lived and modest decline in the terms of trade in the period surrounding the surplus adjustment. Interestingly, this lack of a well defined and sharp "typical" behavior in current account surplus adjustment episodes contrasts with the case of large and abrupt current account reversals. As I document in Edwards (2005), current account reversal episodes have historically been characterized by sharp depreciations, significantly higher real interest rates and (very) significant declines in the rate of growth

relative to trend. These differences between current account reversals and surplus adjustment episodes confirm the notion discussed throughout this paper of the asymmetry of these two phenomena.

VI. Concluding Remarks

This paper has dealt with current account surplus. Several questions were asked: (1) What have been the most important regularities of surpluses during the last 35 years. More specifically, has there been an asymmetry between surpluses and deficits? (2) How persistent have large surpluses been? Has their degree of persistence been higher than large deficits? (3) What has been the relationship between current account balances and the business cycle? (4) What has been the relationship between external balances and countries' net external position? (5) Is a realignment of world growth rates -- with Japan and Europe growing faster and the U.S. growing more slowly – likely to solve the current situation of global imbalances? This is a particularly important question, as a number of analysts and U.S. government officials have argued that a "normalization" of growth would help solve global imbalances. And, (6) what has been the anatomy of significant and large surplus adjustments – defined as a decline in the surplus of at least 2% of GDP in one year?

The results obtained may be summarized as follows:

- There has been an important asymmetry between current account deficits and surpluses. During the last 35 years, on average, only 27.6% of all countries have run surpluses during a particular year. This percentage, however, has increased significantly during the last few years. During 2003-2004 almost 40% of countries posted surpluses.
- The most important recent changes in current account balances have occurred in Asia, where there has been a current account reversal in excess of 5% of GDP between 1997 and 2003-2004.
- Large surpluses exhibit very little persistence through time.
- Very few large countries have had persistently large surpluses to GDP ratios. Persistency of surpluses is higher in the Middle East; this is mostly a reflection of the role played by oil exporting countries.

- Large surpluses are slightly more persistent than large deficits. However, the degree of persistence of both type of imbalances is low.
- Large and abrupt reductions in surpluses – what I call "surplus adjustment" episodes -- are a relatively rare phenomenon. Their incidence fluctuates between 3.0% and 6.6% of all country years.
- The incidence of surplus adjustment episodes has been largest in the Middle East and smallest in the Advanced countries.
- Surplus adjustment episodes have been associated with real exchange rate appreciations and with deterioration in the terms of trade.
- No clear-cut picture emerges regarding the behavior of interest rates, inflation, and economic growth in the period surrounding major surplus adjustment episodes.
- The econometric results reported in this paper indicate that the behavior of the current account balance can be explained by parsimonious models based on economic theory.
- In particular, current account balances have been associated to the business cycle, real exchange rates, fiscal imbalances and the country's net external position. All of these variables enter into the current account equation with the expected sign, and their coefficients are significant.
- The results obtained suggest that a decline in growth relative to long term trend of 1 percentage point results in an improvement in the current account balance – higher surplus or lower deficit – of one quarter of a percentage point of GDP.
- These results indicate that a realignment of global growth – with Japan and the Euro Zone growing faster and the U.S. moderating its growth – would only make a modest contribution towards the resolution of current global imbalances.
- This suggests that, even if there is a realignment of global growth, the world is likely to need significant exchange rate movements.
- This analysis also suggests that a reduction in China's (very) large surplus will be needed if global imbalances are to be resolved.

Table 1

Current Account Balances as Percentage of GDP in the World Economy: Means, 1970-2004

	Region						
Year	Africa	Asia	East Europe	Industrial	Latin America	Middle East	All Countries
1970	-3.01	-0.26		0.05	-7.51	-6.66	-2.81
1971	-6.01	-0.64		0.26	-5.53	-2.50	-2.21
1972	-4.44	-2.43		1.38	-3.78	3.79	-0.68
1973	-5.10	-1.36		1.15	-3.32	1.82	-0.78
1974	2.25	-4.57	-1.50	-2.51	-3.20	6.44	-0.68
1975	-4.45	-5.46	-3.55	-1.33	-2.33	8.38	-2.20
1976	-5.70	0.37	-3.81	-2.00	-1.46	9.42	-1.43
1977	-3.63	0.76	-5.14	-1.70	-4.08	5.39	-1.97
1978	-8.25	-1.79	-1.90	-0.42	-3.74	-0.46	-4.06
1979	-6.02	1.58	-1.60	-1.30	-4.54	8.44	-2.56
1980	-7.05	-7.49	-0.02	-2.03	-6.91	9.13	-4.72
1981	-9.51	-11.63	-1.15	-2.32	-10.00	7.61	-7.15
1982	-10.82	-10.85	-0.96	-2.23	-9.08	1.76	-7.66
1983	-8.22	-8.22	-1.26	-1.14	-6.53	-1.03	-5.82
1984	-5.63	-3.07	-0.15	-0.88	-4.27	-0.87	-3.56
1985	-5.64	-5.04	-1.54	-1.01	-2.84	-0.89	-3.59
1986	-6.00	-3.84	-2.80	-0.75	-5.44	-0.58	-4.16
1987	-4.64	-3.20	-0.17	-0.86	-5.42	-0.05	-3.48
1988	-5.80	-2.85	1.05	-0.71	-4.44	0.03	-3.51
1989	-4.42	-3.94	-0.33	-0.99	-5.22	4.74	-3.09
1990	-4.04	-4.50	-2.96	-1.04	-4.26	4.99	-2.86
1991	-4.40	-2.30	-2.70	-0.71	-6.87	-28.55	-5.87
1992	-5.33	-3.07	-0.01	-0.46	-5.59	-8.93	-4.12
1993	-5.39	-4.32	-2.04	0.42	-6.13	-7.68	-4.30
1994	-4.80	-2.49	-1.37	0.27	-4.80	-3.30	-3.16
1995	-6.66	-3.24	-3.45	0.80	-5.10	-1.42	-3.91
1996	-6.51	-2.95	-6.84	0.69	-5.74	-0.32	-4.42
1997	-4.13	-3.57	-7.31	1.04	-7.83	-0.15	-4.25
1998	-7.36	-0.44	-9.28	0.18	-8.09	-5.48	-5.68
1999	-6.69	1.76	-5.31	0.03	-6.45	2.55	-3.63
2000	-3.58	1.87	-3.02	0.00	-6.00	6.74	-2.02
2001	-5.99	1.52	-3.27	0.37	-7.61	2.53	-3.38
2002	-4.78	2.85	-3.56	0.72	-7.46	1.82	-2.96
2003	-2.48	4.80	-4.40	0.28	-5.42	3.70	-1.75
2004	-2.07	1.97	-4.56	0.12	-2.97	4.00	-1.29
All Years	-5.65	-2.74	-3.89	-0.50	-5.71	0.47	-3.73

Table 2
Current Account Balances as Percentage of GDP in the World Economy: Medians, 1970-2004

	Region						
Year	Africa	Asia	East Europe	Industrial	Latin America	Middle East	All Countries
1970	-1.90	-0.90		0.40	-4.07	-5.90	-1.10
1971	-7.53	-1.00		0.27	-4.60	-7.25	-1.04
1972	-0.93	-1.55		0.71	-1.45	-1.10	-0.41
1973	-4.40	-0.70		0.44	-1.07	-2.18	-0.86
1974	-2.71	-3.00	-1.50	-1.90	-4.00	0.29	-2.92
1975	-6.13	-3.64	-3.55	-1.26	-4.09	3.01	-3.30
1976	-5.17	1.28	-3.81	-1.96	-1.41	2.19	-2.94
1977	-3.39	0.84	-5.14	-1.89	-3.96	1.45	-2.80
1978	-9.91	-2.03	-1.90	-0.63	-3.95	-2.76	-3.23
1979	-4.64	-2.67	-1.60	-0.65	-4.68	9.02	-2.73
1980	-7.21	-3.77	-0.02	-2.29	-5.59	3.96	-4.04
1981	-9.44	-8.54	-1.15	-2.58	-7.80	-1.43	-6.46
1982	-8.68	-7.77	-1.48	-1.84	-7.41	1.53	-5.81
1983	-6.35	-6.56	-0.86	-0.77	-4.70	-2.98	-4.24
1984	-2.61	-2.27	-0.63	-0.17	-3.96	-4.84	-2.43
1985	-3.90	-3.59	-1.51	-0.96	-2.08	-2.68	-2.37
1986	-3.95	-2.19	-1.94	0.21	-2.98	-2.34	-2.58
1987	-4.66	-1.68	-0.76	-0.35	-3.95	-2.07	-2.36
1988	-5.76	-2.57	-0.72	-1.03	-2.36	-2.21	-2.61
1989	-3.52	-3.44	-1.70	-1.47	-4.36	0.47	-2.63
1990	-3.78	-3.93	-3.69	-1.37	-2.78	2.82	-2.63
1991	-3.18	-3.10	-0.70	-0.88	-4.35	-9.38	-2.83
1992	-4.51	-3.66	0.10	-0.80	-3.98	-9.26	-3.01
1993	-4.29	-4.11	-2.29	-0.53	-5.47	-6.75	-3.19
1994	-3.66	-3.49	-1.42	0.35	-3.11	-4.60	-2.28
1995	-4.48	-4.97	-1.89	0.73	-2.96	-1.37	-2.50
1996	-4.21	-3.90	-5.01	0.93	-4.50	0.36	-3.43
1997	-4.65	-2.82	-6.08	0.20	-5.39	-0.15	-3.74
1998	-5.68	-0.73	-7.21	-0.47	-5.36	-2.56	-4.30
1999	-6.52	2.73	-5.29	0.26	-4.33	0.26	-2.97
2000	-4.50	1.71	-4.80	-0.46	-4.50	6.74	-3.18
2001	-4.79	1.84	-4.74	-0.06	-4.34	3.53	-2.95
2002	-2.82	3.15	-5.13	0.52	-5.31	5.44	-1.98
2003	-4.28	2.94	-5.78	-0.10	-3.91	3.53	-1.65
2004	-3.28	1.83	-5.18	-0.60	-1.09	1.75	-2.00
All Years	-4.74	-2.36	-3.47	-0.55	-4.33	-0.58	-2.96

Table 3
Current Account Balances as Percentage of GDP in the World Economy: Proportion of Countries with Surpluses, 1970-2004

	Region						
Year	Africa	Asia	East Europe	Industrial	Latin America	Middle East	All Countries
1970	0.333	0.200		0.625	0.000	0.000	0.292
1971	0.000	0.200		0.600	0.167	0.250	0.321
1972	0.000	0.333		0.727	0.167	0.500	0.433
1973	0.000	0.333		0.545	0.333	0.500	0.400
1974	0.273	0.143	0.000	0.333	0.143	0.600	0.279
1975	0.200	0.100	0.000	0.316	0.200	0.667	0.258
1976	0.083	0.545	0.000	0.238	0.412	0.667	0.313
1977	0.242	0.500	0.000	0.304	0.231	0.500	0.305
1978	0.162	0.333	0.000	0.435	0.250	0.222	0.264
1979	0.237	0.400	0.000	0.261	0.233	0.556	0.284
1980	0.244	0.125	0.500	0.217	0.188	0.600	0.242
1981	0.143	0.000	0.500	0.304	0.094	0.400	0.165
1982	0.116	0.056	0.333	0.391	0.031	0.500	0.171
1983	0.093	0.222	0.333	0.348	0.125	0.400	0.194
1984	0.256	0.250	0.500	0.391	0.212	0.300	0.278
1985	0.311	0.100	0.000	0.391	0.303	0.300	0.279
1986	0.213	0.250	0.000	0.565	0.219	0.200	0.270
1987	0.229	0.250	0.333	0.304	0.212	0.300	0.250
1988	0.167	0.250	0.333	0.261	0.242	0.200	0.221
1989	0.208	0.250	0.333	0.348	0.242	0.545	0.277
1990	0.208	0.200	0.333	0.348	0.303	0.750	0.303
1991	0.250	0.250	0.429	0.391	0.152	0.182	0.254
1992	0.188	0.286	0.538	0.391	0.273	0.182	0.282
1993	0.208	0.190	0.350	0.478	0.242	0.250	0.274
1994	0.333	0.286	0.391	0.522	0.212	0.417	0.344
1995	0.277	0.200	0.208	0.542	0.125	0.417	0.277
1996	0.283	0.250	0.120	0.542	0.091	0.583	0.275
1997	0.200	0.100	0.120	0.500	0.030	0.500	0.208
1998	0.116	0.450	0.080	0.478	0.030	0.333	0.205
1999	0.163	0.600	0.080	0.542	0.156	0.545	0.290
2000	0.256	0.529	0.200	0.458	0.156	0.667	0.320
2001	0.227	0.647	0.160	0.480	0.063	0.583	0.297
2002	0.256	0.688	0.200	0.583	0.152	0.636	0.351
2003	0.297	0.786	0.160	0.500	0.241	0.818	0.386
2004	0.259	0.583	0.227	0.458	0.304	0.727	0.378
All Years	0.215	0.305	0.215	0.422	0.185	0.462	0.276

Table 4
Countries with "Persistently High" Current Account Surpluses, 1970-2004

	High 1		*High 2*	
Country	**Years**	**Country**	**Years**
	Industrial		
Belgium:	(1989 - 2001)	Germany:	(1986 - 1989)
Finland:	(1995 - 2004)	Luxembourg:	(1995 - 1999)
Germany:	(1984 - 1990)	Malta:	(1975 - 1981)
Japan:	(1983 - 1989)	Norway:	(2000 - 2004)
Luxembourg:	(1995 - 2004)	Switzerland:	(1991 - 2001)
Malta:	(1972 - 1982)		
Netherlands:	(1972 - 1977) (1981 - 1985) (1987 - 1991) (1993 - 1999)		
Norway:	(1980 - 1985) (1994 - 1997) (1999 - 2004)		
Switzerland:	(1981 - 2004)		
United Kingdom:	(1980 - 1983)		
	Latin America		
Guyana:	(1986 - 1989)	Suriname:	(1987 - 1990) (1992 - 1995)
Panama:	(1987 - 1990)	Venezuela, RB:	(1999 - 2004)
Suriname:	(1987 - 1990) (1992 - 1995)		
Trinidad and Tobago:	(1975 - 1978) (1992 - 1996) (1999 - 2003)		
Uruguay:	(1988 - 1991)		
Venezuela, RB:	(1994 - 1997) (1999 - 2004)		
	Asia		
China:	(1994 - 1997)	Hong Kong, China:	(1984 - 1990)
Fiji:	(1985 - 1988)	Papua New Guinea:	(1993 - 1996)
Hong Kong, China:	(1970 - 1978) (1983 - 1994) (2001 - 2004)	Singapore:	(1989 - 1992) (1994 - 2004)
Korea, Rep.:	(1986 - 1989)		
Malaysia:	(1998 - 2003)		
Papua New Guinea:	(1992 - 1996)		
Singapore:	(1988 - 2004)		
	Africa		
Botswana:	(1985 - 1989) (1991 - 2003)	Botswana:	(1985 - 1989) (1991 - 1999)
Chad:	(1980 - 1984)	Gabon:	(1979 - 1984) (1994 - 1997) (1999 - 200
Gabon:	(1978 - 1984) (1994 - 1997) (1999 - 2003)	Gambia, The:	(1987 - 1990)
Gambia, The:	(1984 - 1992)	Lesotho:	(1990 - 1994)
Lesotho:	(1980 - 1984) (1989 - 1994)	Libya:	(1977 - 1980)
Liberia:	(1979 - 1982)		
Libya:	(1977 - 1980) (1994 - 1997)		
Mauritania:	(1995 - 2001)		
Namibia:	(1990 - 2004)		
Nigeria:	(1989 - 1992) (1999 - 2004)		
South Africa:	(1977 - 1980) (1985 - 1993)		
Swaziland:	(1986 - 1991)		
Zimbabwe:	(1986 - 1989)		
	Middle East		
Kuwait:	(1975 - 1990) (1993 - 2004)	Kuwait:	(1980 - 1990) (1993 - 2004)
Saudi Arabia:	(1971 - 1974)		(1998 - 2004)
	East Europe		
Russian Federation:	(1998 - 2004)	Russian Federation:	
Ukraine:	(1999 - 2004)		
	Other		
Samoa:	(1995 - 1998)		

Table 5
Persistence in Current Account Imbalances: Marginal Effects From Variance Component Probits

	High1		High2	
	Surplus	Deficits	Surplus	Deficits
Lag 1	0.403	0.478	0.137	0.279
	(12.53) ***	(18.99) ***	(4.35) ***	(5.66) ***
Lag 2	0.059	0.085	0.040	0.032
	(2.62) ***	(3.32) ***	(2.50) **	(1.92) *
Lag 3	0.008	0.032	0.015	0.003
	(0.39)	(1.28)	(1.37)	(0.24)
Lag 4	0.089	0.084	0.025	0.021
	(3.75) ***	(3.39) ***	(1.96) **	(1.36)
Probability	0.122	0.788	0.025	0.034
Number of Observations	3415	3415	3415	3415
Number of Groups	161	161	161	161

***,** ,* null is rejected at 1, 5 and 10 percent level. Test - t in parenthesis

Table 6
Countries with "Persistently High" Current Account Surpluses, 1970-2004

Country	Years
	Industrial
Belgium:	(1991 - 1997)
France:	(1995 - 2001)
Germany:	(1973 - 1978) (1983 - 1990)
Italy:	(1994 - 1998)
Japan:	(1981 - 2004)
Netherlands:	(1981 - 1999)
Norway:	(1999 - 2004)
Switzerland:	(1984 - 2004)
	Latin America
El Salvador:	(1979 - 1984)
Trinidad and Tobago:	(1990 - 1996) (1999 - 2003)
Venezuela, RB:	(1999 - 2004)
	Asia
China:	(1994 - 2004)
Hong Kong, China:	(1970 - 1980) (1982 - 1994)
Papua New Guinea:	(1993 - 1997)
Singapore:	(1988 - 2004)
	Africa
Botswana:	(1985 - 1989) (1991 - 2001)
Ethiopia:	(1993 - 1997)
Gabon:	(1978 - 1984) (1999 - 2003)
Namibia:	(1990 - 2004)
Nigeria:	(1999 - 2004)
South Africa:	(1985 - 1994)
Swaziland:	(1986 - 1991)
	Middle East
Kuwait:	(1977 - 1981) (1983 - 1990) (1993 - 2004)
Saudi Arabia:	(1971 - 1977) (2000 - 2004)
	East Europe
Russian Federation:	(1992 - 2004)
Ukraine:	(1999 - 2004)

Table 7
The Current Account and the Business Cycle: Variance Component Regressions, 1970-2004

	Random Effects			Fixed Effects		
	Large Countries	Industrial Countries	Non Industrial Countries	Large Countries	Industrial Countries	Non Industrial Countries
Growth Gap	0.217	0.18	0.207	0.225	0.191	0.206
	(5.72) ***	(3.21) ***	(4.5) ***	(5.8) ***	(3.3) ***	(4.3) ***
Change in Terms of Trade	0.028	0.113	0.013	0.029	0.114	0.013
	(2.25) **	(4.74) ***	(0.97)	(2.24) **	(4.75) ***	(0.96)
Public Sector Deficit / GDP	-0.162	-0.211	-0.06	-0.188	-0.222	-0.116
	(-4.23) ***	(-4.08) ***	(-1.13)	(-4.38) ***	(-4.14) ***	(-1.66) *
Accumulate Change RER	0.008	0.004	0.026	0.008	0.004	0.026
	(3.62) ***	(3.54) ***	(4.44) ***	(4.25) ***	(4.37) ***	(4.47) ***
Net External Position / GDP	0.064	0.069	0.070	--	--	--
	(9.06) ***	(5.54) ***	(5.66) ***			
R^2	0.2377	0.3627	0.184	0.0628	0.0822	0.0995
Number of Observations	1001	522	479	1001	522	479
Number of Groups	41	20	21	41	20	21

***,** ,* statistical significant at 1, 5 and 10 percent level.

Table 8
Net External Position Regressions: 1970-2004

	No Regional Dummies	Regional Dummies
Trade Openness	0.293	0.163
	(2.3) **	(1.18)
Gov. Consumption / GDP	-2.488	-2.507
	(-2.48) **	(-2.13) **
Commodity Dummy	-3.592	-5.223
	(-0.85)	(-1.02)
Political Stability	6.616	1.541
	(1.73) *	(0.33)
GDP per capita Growth	-1.622	-3.159
	(-0.71)	(-1.31)
Financial Openness	0.39	0.395
	(1.29)	(1.29)
Inflation	-0.153	-0.13
	(-3.87) ***	(-3.03) ***
Initial GDP per capita	28.329	29.45
	(5.84) ***	(4.72) ***
R^2	0.1747	0.2104
Between R^2	0.3986	0.4555
Number of Observations	2912	2904
Number of Groups	130	129

***,** ,* statistical significant at 1, 5 and 10 percent level.

Table 9
The Current Account and the Business Cycle, Alternative Measure of NEP/GDP: Variance Component Regressions, 1970-2004

	Large Countries	Industrial Countries	Non Industrial Countries
Growth Gap	0.244	0.155	0.251
	(6.00) ***	(2.68) ***	(5.17) ***
Change in Terms of Trade	0.027	0.127	0.012
	(2.06) **	(4.65) ***	(0.84)
Public Sector Deficit / GDP	-0.139	-0.138	-0.04
	(-3.3) ***	(-2.79) ***	(-0.67)
Accumulate Change RER	0.007	0.005	0.025
	(3.54) ***	(3.92) ***	(4.33) ***
Net External Position / GDP	0.017	0.049	0.011
	(2.78) ***	(6.83) ***	(2.51) **
R^2	0.1611	0.391	0.1446
Number of Observations	949	488	461
Number of Groups	41	20	21

***,** ,* statistical significant at 1, 5 and 10 percent level.

Table 10
The Current Account and the Business Cycle:
Variance Component Instrumental Variable Regressions, 1970-2004

	Large Countries	Industrial Countries	Non Industrial Countries
Accumulate Change RER	0.067	-0.001	0.111
	(2.02) **	(-0.04)	(0.044) **
Growth Gap	0.155	0.19	1.36
	(2.76) ***	(3.39) ***	(0.074)
Change in Terms of Trade	0.011	0.124	-0.180
	(0.61)	(4.74) ***	(0.019)
Public Sector Deficit / GDP	-0.163	-0.190	0.040
	(-3.42) ***	(-2.4) **	(0.066)
Net External Position / GDP	0.075	0.069	5.590
	(9.65) ***	(5.55) ***	(0.015) ***
R^2	0.0916	0.3706	0.1069
Between R^2	0.5953	0.6783	0.7941
Number of Observations	924	475	449
Number of Groups	40	19	21

***,** ,* statistical significant at 1, 5 and 10 percent level.

Table 11
The Current Account and the Business Cycle:
Variance Component Regressions with Interactions, 1970-2004

	Full Sample
Growth Gap	0.124
	(2.27) **
Change in Terms of Trade	0.033
	(2.48) **
Public Sector Deficit / GDP	-0.073
	(-1.85) *
Accumulate Change RER	0.008
	(4.01) ***
Net External Position / GDP	0.055
	(8.09) ***
Growth Gap / GDP interactions with	
Latin America	0.029
	(0.33)
Asia	0.306
	(3.39) ***
Africa	0.523
	(2.75) ***
Middle East	0.037
	(0.3)
East Europe	-0.081
	(-0.84)
Net External Position / GDP interactions with	
Latin America	-0.054
	(-7.58) ***
Asia	0.038
	(2.36) **
Africa	-0.036
	(-0.85)
Middle East	-0.004
	(-0.22)
East Europe	-0.001
	(-0.02)
R^2	0.3031
Between R^2	0.6068
Number of Observations	949
Number of Groups	41

***,** ,* statistical significant at 1, 5 and 10 percent level.

Table 12
Surplus Adjustment Episodes:
Incidence by Region, 1970-2004

	2%	3%
Industrial	2.51	1.64
Latin America	5.41	2.15
Asia	6.93	3.43
Africa	6.3	2.51
Middle East	19.69	10.2
East Europe	5.62	2.43
No region	9.49	3.28
All	6.63	3.02

Table 13a
Surplus Adjustment 2% Episodes: Non-Parametric Tests

	All Countries		Industrial Countries		Large Countries	
	Chi^2	Obs.	Chi^2	Obs.	Chi^2	Obs.
			t = +3 v/s t = -3			
Real Exchange Rate	3.6085 *	233	0	22	2.45	80
Nominal Exchange Rate	35.6447 ***	258	0.7273	22	9.561 ***	82
Real Interest Rate	0.0554	147	0.0903	13	3.4309 *	49
GDP PC growth	6.1089 **	251	0	22	3.5742 *	81
Inflation	2.8648 *	238	0.7273	22	0.05	80
Terms of Trade	0.2243	164	0.0903	13	0.0149	61
			t = +1 v/s t = -1			
Real Exchange Rate	10.9325 ***	257	6.042 **	24	14.4061 ***	85
Nominal Exchange Rate	31.2238 ***	281	2.6853	24	8.3887 ***	87
Real Interest Rate	2.9858 *	177	0.2917	14	0.6676	54
GDP PC growth	0	278	0.6713	24	0.0465	86
Inflation	0.5547	260	0	24	0.1051	85
Terms of Trade	30.2112 ***	187	0	16	14.3338 ***	67
			t = +3 v/s t = -1			
Real Exchange Rate	5.5415 **	247	2.9091 *	22	8.2488 ***	82
Nominal Exchange Rate	47.9801 ***	273	0.7273	22	9.3386 ***	84
Real Interest Rate	7.1592 ***	171	0.0903	13	3.7692 *	52
GDP PC growth	0.4495	269	0	22	0.9736	83
Inflation	2.4481	255	0	22	0.0488	82
Terms of Trade	13.9164 ***	180	0	14	10.5625 ***	64

***,** ,* null is rejected at 1, 5 and 10 percent level. Null: medians are equal. Groups are 2 in all cases

Table 13b
Surplus Adjustment 3% Episodes: Non-Parametric Tests

	All Countries		Industrial Countries		Large Countries	
	Chi^2	Obs.	Chi^2	Obs.	Chi^2	Obs.
			t = +3 v/s t = -3			
Real Exchange Rate	1.2217	118	0.0764	11	1.316	37
Nominal Exchange Rate	18.9553 ***	129	0.0764	11	0.235	39
Real Interest Rate	0.0607	68	0.5	8	1.1494	21
GDP PC	0	124	0.8831	11	0.0244	39
CPI	2.421	119	0.0764	11	0.0285	37
Terms of Trade	2.4747	80	0.1094	7	0.6154	26
			t = +1 v/s t = -1			
Real Exchange Rate	6.4127 **	131	1.1429	14	2.2727	44
Nominal Exchange Rate	14.3686 ***	144	1.1429	14	5.5652 **	46
Real Interest Rate	0.014	81	0.5	8	0.0344	27
GDP PC	1.2107	139	0	14	1.3913	46
CPI	2.7507 *	131	0	14	0.0909	44
Terms of Trade	6.7189 ***	93	0.5	8	2.5996	31
			t = +3 v/s t = -1			
Real Exchange Rate	1.1616	124	1.3714	12	0.2317	41
Nominal Exchange Rate	21.3833 ***	136	0	12	5.2122 **	43
Real Interest Rate	0.4618	78	0.5	8	1.0193	25
GDP PC	1.0912	132	1.3714	12	0.601	43
CPI	2.5721	126	1.3714	12	0.0211	41
Terms of Trade	0.0112	87	0.1094	7	0.5744	28

***,** ,* null is rejected at 1, 5 and 10 percent level. Null: medians are equal. Groups are 2 in all cases

Figure 1

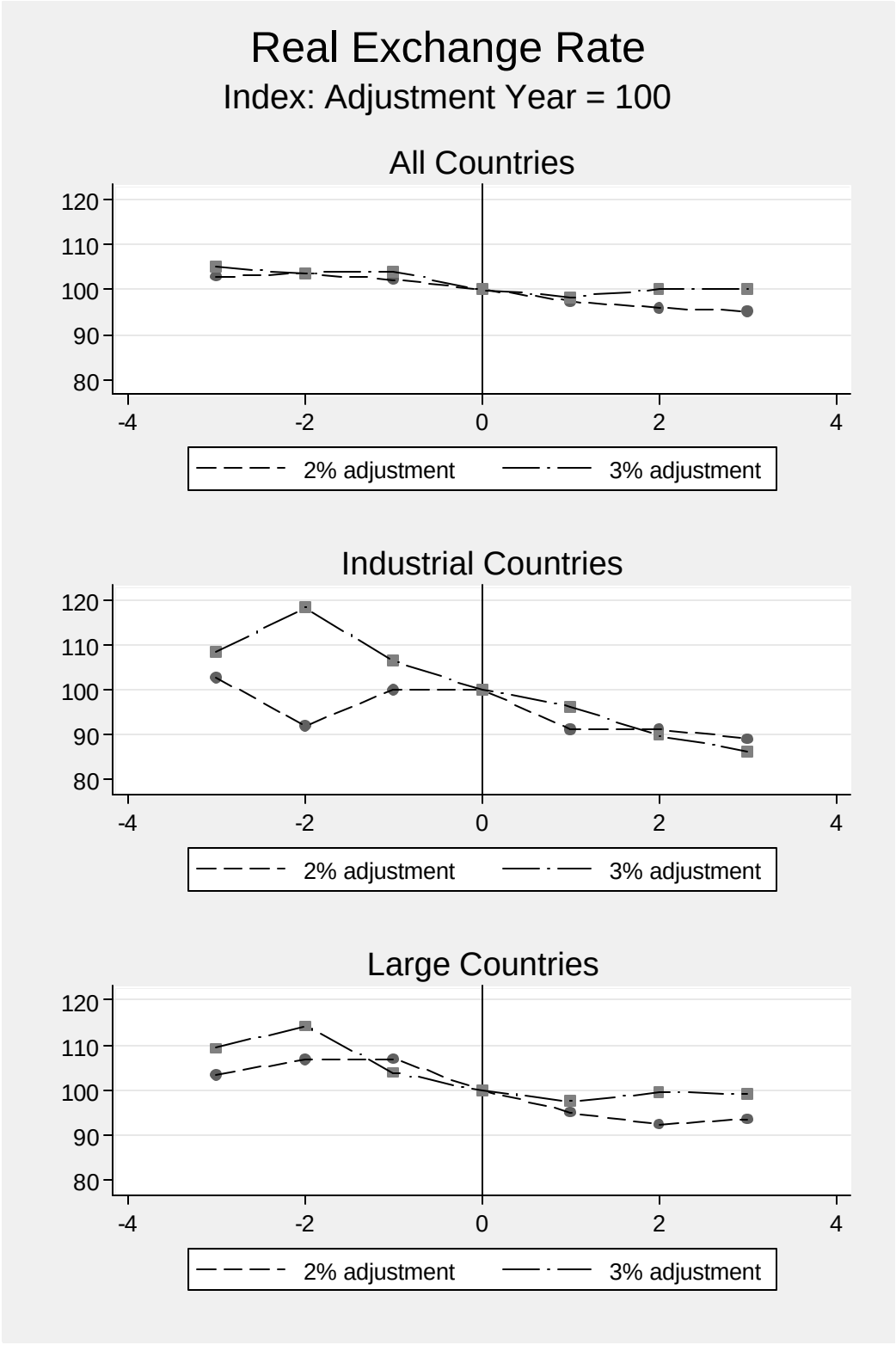
Real Exchange Rate
Index: Adjustment Year = 100
All Countries
120
110
100
90
80
-4
-2
0
2
4
2% adjustment
3% adjustment
Industrial Countries
120
110
100
90
80
-4
-2
0
2
4
2% adjustment
3% adjustment
Large Countries
120
110
100
90
80
-4
-2
0
2
4
2% adjustment
3% adjustment

Figure 2

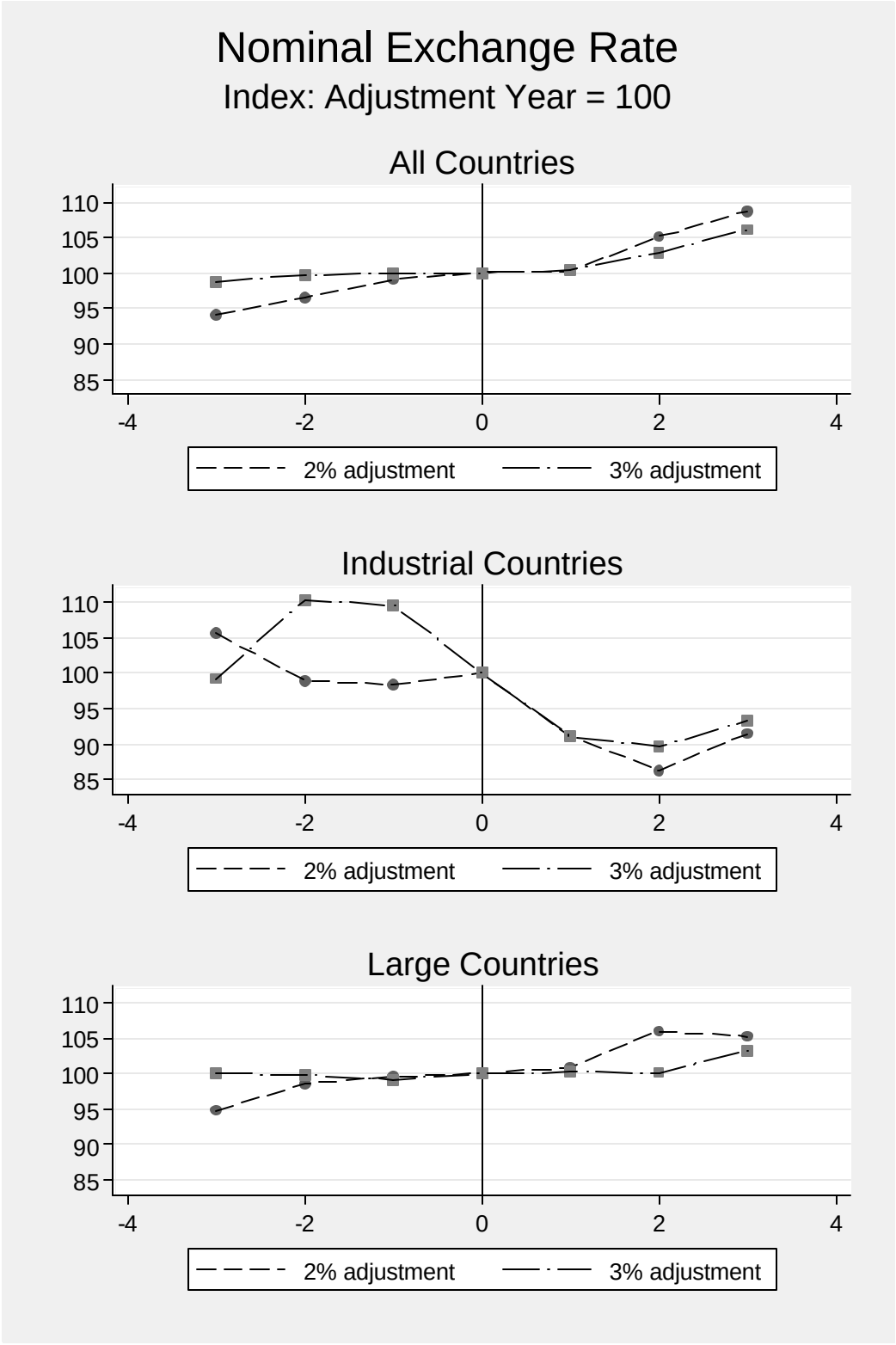
Nominal Exchange Rate
Index: Adjustment Year = 100
All Countries
110
105
100
95
90
85
-4
-2
0
2
4
2% adjustment
3% adjustment
Industrial Countries
110
105
100
95
90
85
-4
-2
0
2
4
2% adjustment
3% adjustment
Large Countries
110
105
100
95
90
85
-4
-2
0
2
4
2% adjustment
3% adjustment

Figure 3

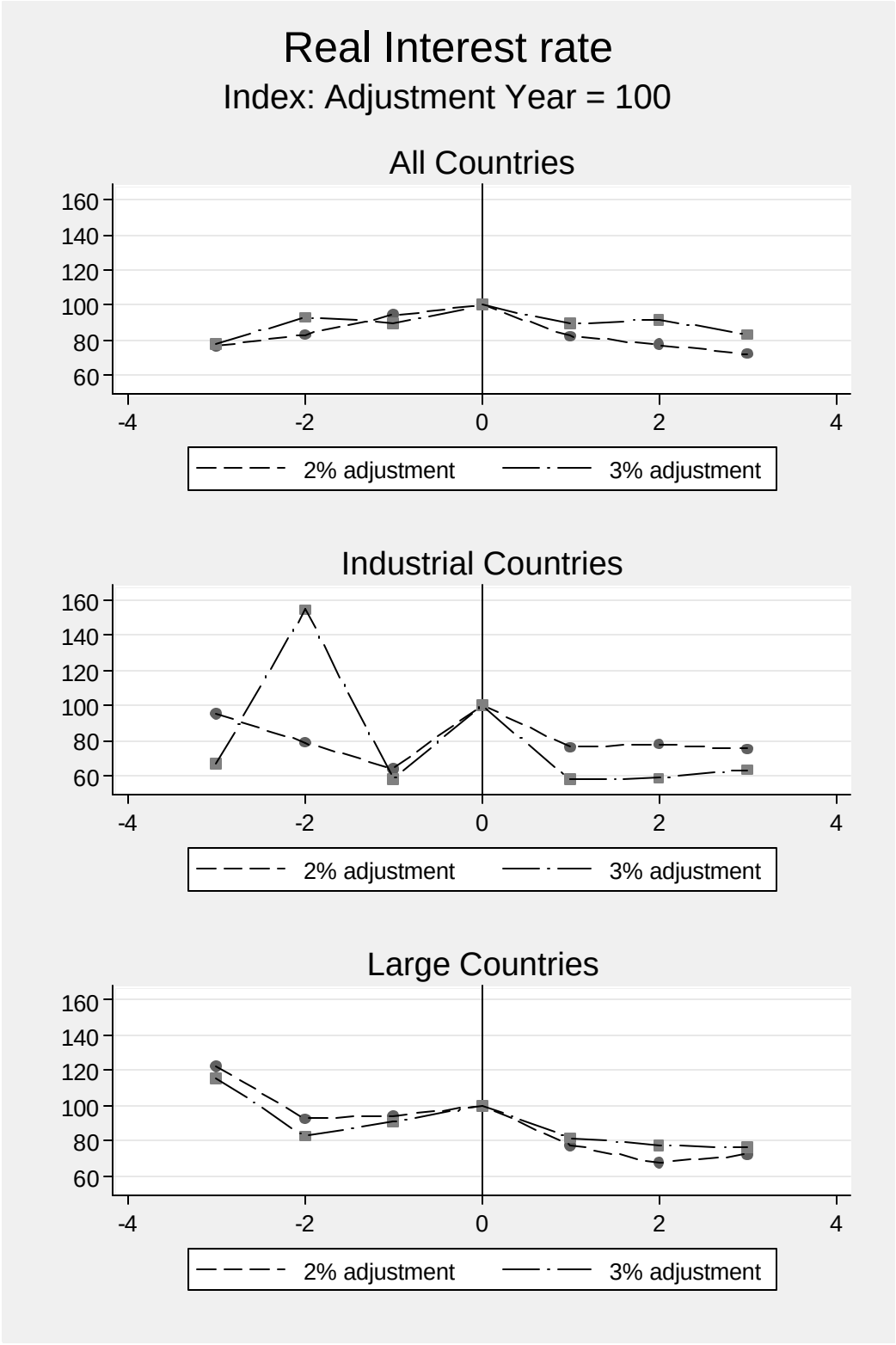
Real Interest rate
Index: Adjustment Year = 100
All Countries
160
140
120
100
80
60
-4
-2
0
2
4
2% adjustment
3% adjustment
Industrial Countries
160
140
120
100
80
60
-4
-2
0
2
4
2% adjustment
3% adjustment
Large Countries
160
140
120
100
80
60
-4
-2
0
2
4
2% adjustment
3% adjustment

Figure 4

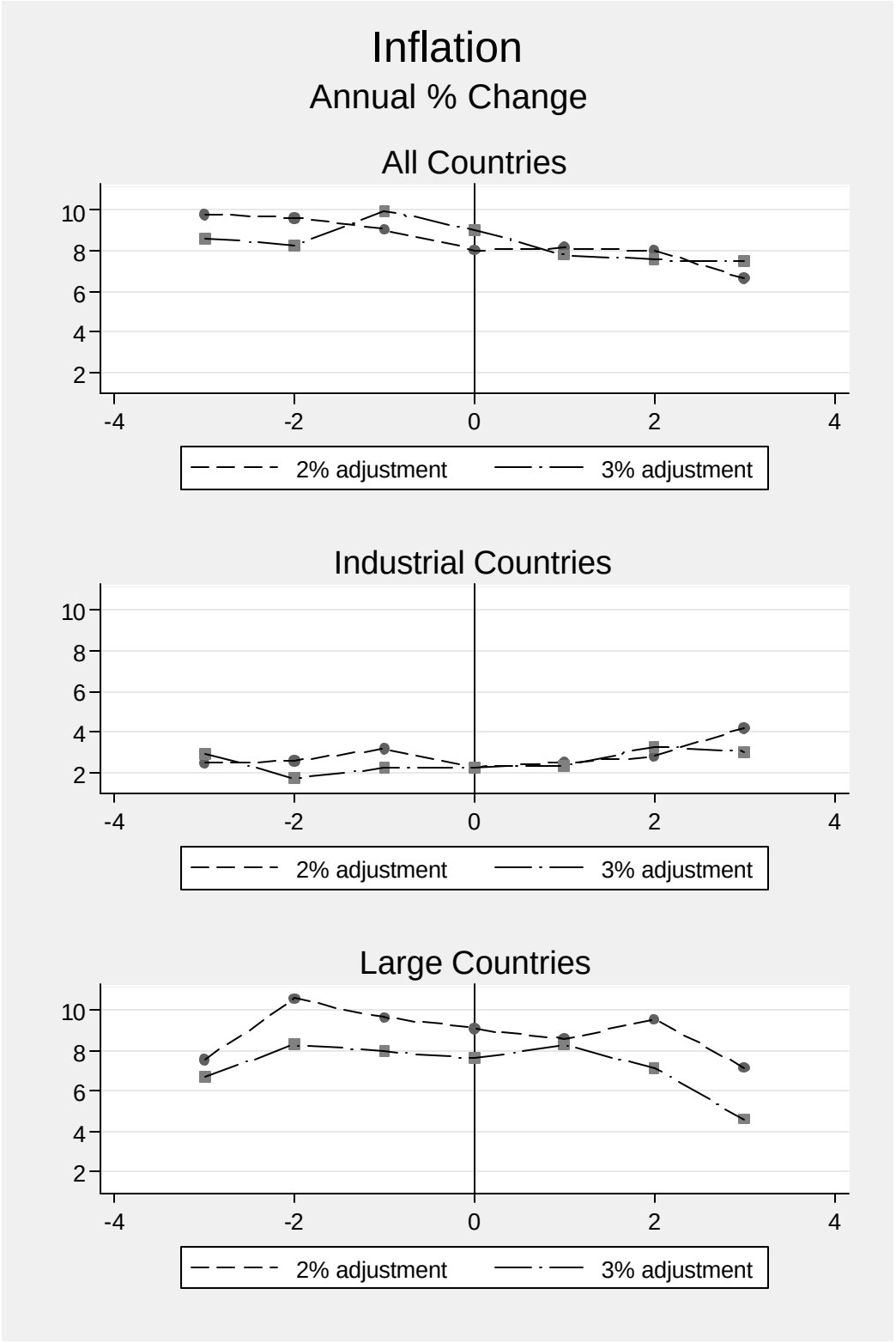
Inflation
Annual % Change
All Countries
10
8
6
4
2
-4
-2
0
2
4
2% adjustment
3% adjustment
Industrial Countries
10
8
6
4
2
-4
-2
0
2
4
2% adjustment
3% adjustment
Large Countries
10
8
6
4
2
-4
-2
0
2
4
2% adjustment
3% adjustment

Figure 5

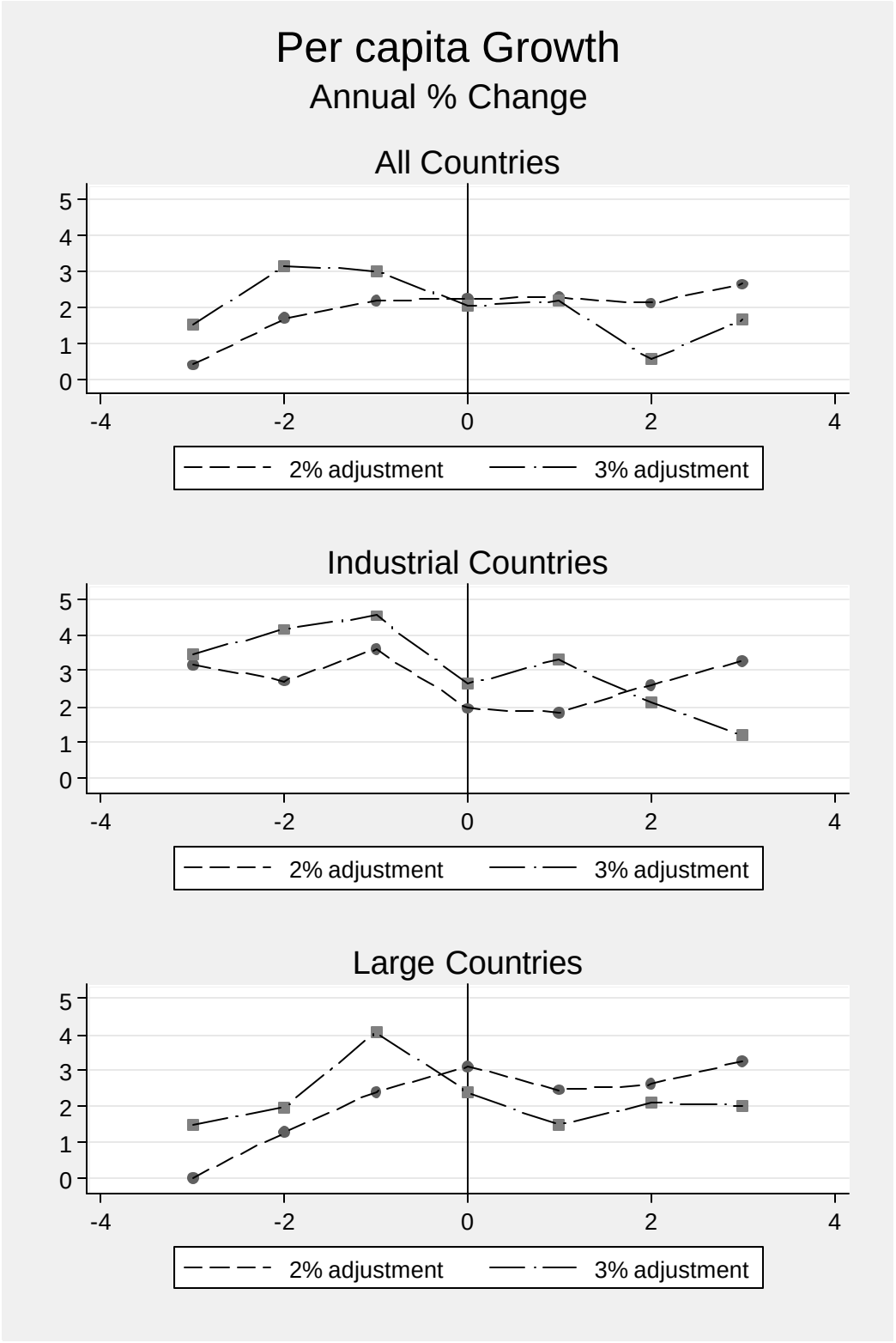
Per capita Growth
Annual % Change
All Countries
5
4
3
2
1
0
-4
-2
0
2
4
2% adjustment
3% adjustment
Industrial Countries
5
4
3
2
1
0
-4
-2
0
2
4
2% adjustment
3% adjustment
Large Countries
5
4
3
2
1
0
-4
-2
0
2
4
2% adjustment
3% adjustment

Figure 6

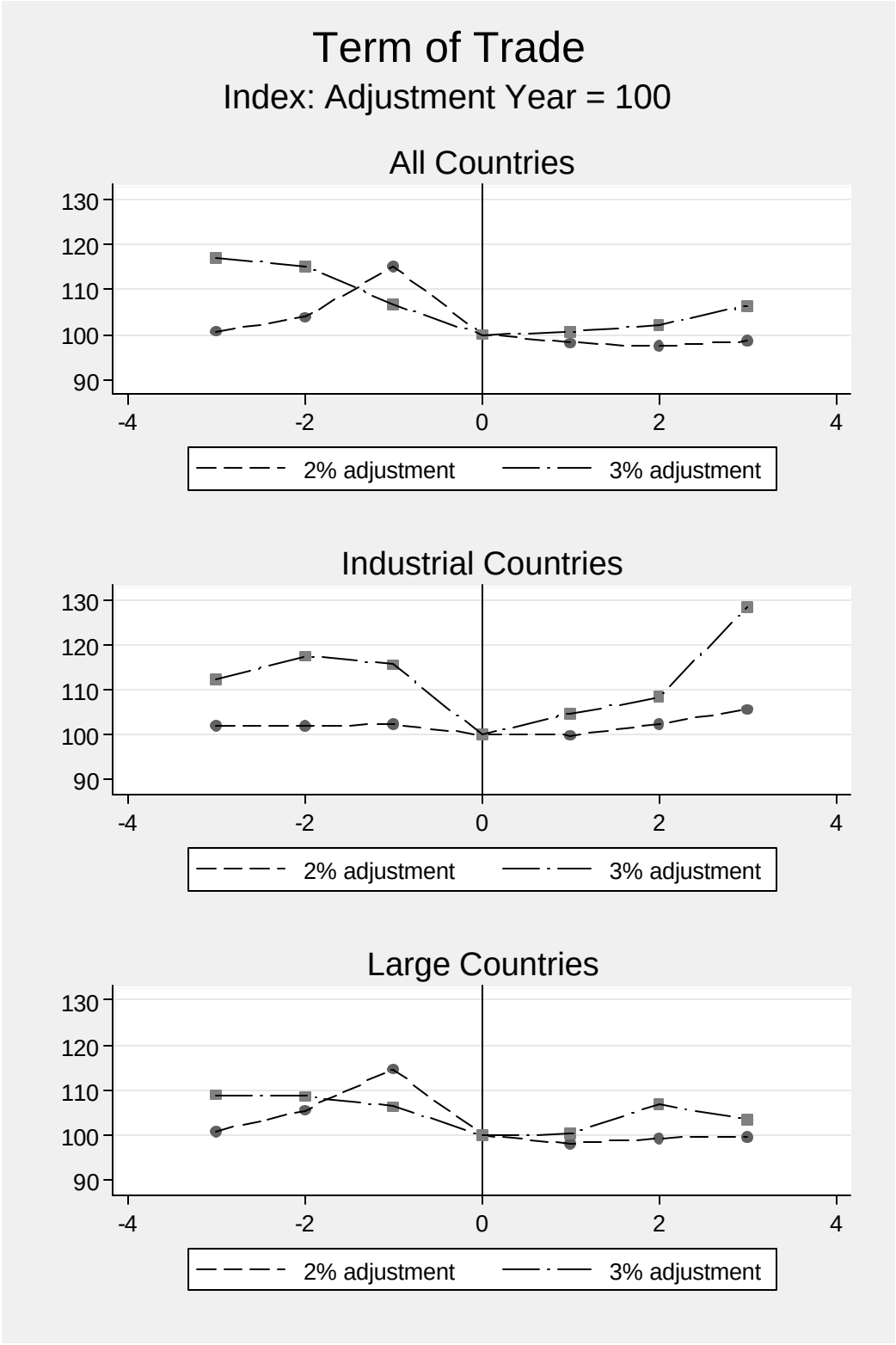
Term of Trade
Index: Adjustment Year = 100
All Countries
130
120
110
100
90
-4
-2
0
2
4
2% adjustment
3% adjustment
Industrial Countries
130
120
110
100
90
-4
-2
0
2
4
2% adjustment
3% adjustment
Large Countries
130
120
110
100
90
-4
-2
0
2
4
2% adjustment
3% adjustment

Table A.1
Current Account Balances as Percentage of GDP in the World Economy: Data Availability, 1970-2004

	Region						
year	Africa	Asia	East Europe	Industrial	Latin America	Middle East	All Countriesl
1970	3	5		8	5	3	24
1971	3	5		10	6	4	28
1972	3	6		11	6	4	30
1973	3	6		11	6	4	30
1974	11	7	1	12	7	5	43
1975	20	10	1	19	10	6	66
1976	24	11	1	21	17	9	83
1977	33	12	1	23	26	10	105
1978	37	12	1	23	28	9	110
1979	38	15	1	23	30	9	116
1980	41	16	2	23	32	10	124
1981	42	18	2	23	32	10	127
1982	43	18	3	23	32	10	129
1983	43	18	3	23	32	10	129
1984	43	20	4	23	33	10	133
1985	45	20	5	23	33	10	136
1986	47	20	5	23	32	10	137
1987	48	20	6	23	33	10	140
1988	48	20	6	23	33	10	140
1989	48	20	6	23	33	11	141
1990	48	20	6	23	33	12	142
1991	48	20	7	23	33	11	142
1992	48	21	13	23	33	11	149
1993	48	21	20	23	33	12	157
1994	48	21	23	23	33	12	160
1995	47	20	24	24	32	12	159
1996	46	20	25	24	33	12	160
1997	45	20	25	24	33	12	159
1998	43	20	25	23	33	12	156
1999	43	20	25	24	32	11	155
2000	43	17	25	24	32	12	153
2001	44	17	25	25	32	12	155
2002	39	16	25	24	33	11	148
2003	37	14	25	24	29	11	140
2004	27	12	22	24	23	11	119
All Years	1277	558	363	746	943	338	4225

Data Appendix

Variable	Definition	Source
Civil Liberties	Index of Civil Liberties,	Freedom House
Coverage of Secondary Education,	Total gross enrollment ratio for secondary education	Barro and Lee (2001)
Current Account		World Development Indicators
Current Account Reversal	Reduction in the current account deficit of at least 4% of GDP in one year.	Author's elaboration based on data of current account
Domestic Credit Growth	Annual growth rate of domestic credit	World Development Indicators
Export		World Development Indicators
Fiscal Deficit	Overall Budget	World Development Indicators
GDP		World Development Indicators
Government Consumption		IMF's International Financial Statistics
Import		World Development Indicators
Inflation	Change in CPI	World Development Indicators
Initial GDP per capita	GDP per capita in 1970	World Development Indicators
Investment Ratio	Total investment over GDP	IMF's International Financial Statistics
Net External Position		Lane and Milesi – Ferretti (2006)
Openness	Predicted trade from bilateral gravity equations	Author's elaboration
Population		World Development Indicators
Real Exchange Rate	(Nominal Exchange Rate*PPI US)/CPI	World Development Indicators
Surplus Adjustment	Two definitions: At least 2% reduction in surplus in one year; a 3% reduction in surplus accumulated over 3 years	Author's elaboration based on data of capital flows (World Development Indicators)
Sudden Stops in Region	Relative occurrence of sudden stops in the country's region (excluding the country itself)	Author's elaboration.
Terms of Trade	Change in term of trade export as capacity to imports (constant local currency unit)	World Development Indicators

REFERENCES

Aizenman, J. 1983. "A theory of current account and exchange rate determinations". European Economic Review Vol. 23(3), pp:261-280

Aizenman, J. and I. Noy. 2004. "On the Two Way Feedback Between Financial and Trade Openness,", NBER Working Paper # 10496.

Barro, R. and J. Lee. 2001. "International Data on Educational Attainment: Updates and Implications," Oxford Economic Papers, Vol. 53(3), pp: 541-63.

Barro, R. and X. Sala-I-Martin. 1995. Economic Growth. McGraw Hill, New York.

Bergsten, C. F. and J. Williamson (Editors). 2003. Dollar Overvaluation and the World Economy. Special Report 16. Institute for International Economics.

Bergsten, C. F. and J. Williamson (Editors). 2004. Dollar Adjustment: How Far? Against What?. Special; Report 17. Institute for International Economics.

Bernanke, B. S. 2005. "The Global Saving Glut and the U.S. Current Account Deficit". Remarks at the Homer Jones Lecture, St. Louis, Missouri. April 14, 2005.

Blanchard, O., F. Giavazzi and F. Sa. 2005. "The U.S. current account and the dollar". NBER working paper # 11137.

Caballero, R., E. Farhi and P. Gourinchas. 2006. "An Equilibrium Model of 'Global Imbalances' and Low Interest Rates". NBER Working Papers # 11996.

Calderon, C., A. Chong and N. Loayza. 2002. "Determinants of Current Account Deficits in Developing Countries". Contributions to Macroeconomics, Vol. 2(1), pp: 1021-1021.

Calvo, G. A., A. Izquierdo and L.F. Mejia. 2004. "On the empirics of sudden stops: The relevance of balance-sheet effects". NBER working paper # 10520.

Calvo, G.A. and E. Talvi, "The Resolution of Global Imbalances," Journal of Policy Modeling, September, 2006

Chinn , M. D. and J. Lee. 2005. "Three Current Account Balances: A 'Semi-Structuralist' Interpretation". NBER Working Paper # 11853

Chinn, M. D. and E. Prasad. 2003. "Medium-Term Determinants of Current Accounts in Industrial and Developing Countries: An Empirical Exploration". Journal of International Economics, Vol. 59(1), pp: 47-76.

Chinn, M. D. and H. Ito. 2005. "Current Account Balances, Financial Development and Institutions: Assaying the World 'Savings Glut'". NBER Working Paper # 11761.

Chote, R. 1999. "IMF: US Slowdown Now Inevitable," Financial Times, April 21, 1999.

Clarida, R. 2005a. "Japan, China, and the U.S. Current account deficit," CATO Journal, Vol. 25(1), pp: 111-114.

Clarida, R. 2005b. “Some Thoughts on ‘The Sustainability and Adjustment of Global Current Account Imbalances’”. Speech given at the Council on Foreign Relations, March 28.

De Gregorio, J. 2005. "Global Imbalances and Exchange Rate Adjustment,"Economic Policy Papers Central Bank of Chile 15, Central Bank of Chile

Dollar, D. 1992. “Outward-Oriented Developing Economies Really Do Grow More Rapidly: Evidence from 95 LDCs, 1976-1985”. Economic Development and Cultural Change,Vol. 40(3), pp:523-44.

Dooley, M., D. Folkerts-Landau and P. Garber. 2004. "The US Current Account Deficit and Economic Development: Collateral for a Total Return Swap". NBER Working Paper # 10727.

Dooley, M., D. Folkerts-Landau and P. Garber. 2005. "Savings Gluts and Interest Rates: The Missing Link to Europe". NBER Working Paper # 11520.

Edwards, S. 2002. “Does the Current Account Matter?” In Edwards, S. and J. A. Frankel (Eds.): Preventing Currency Crises in Emerging Markets, pp: 21-69. University of Chicago Press.

Edwards, S. 2004. "Thirty Years of Current Account Imbalances, Current Account Reversals and Sudden Stops”. IMF Staff Papers, Vol. 51, Special Issue, pp: 1-49.

Edwards, S. 2005a. “Is the U.S. current account deficit sustainable? And if not, how costly is adjustment likely to be?”. Brookings Papers on Economic Activity, Vol. 2005(1), pp: 211–288.

Edwards, S. 2005b. “The end of large current account deficits, 1970–2002: Are there lessons for the United States?”. In The Greenspan era: Lessons for the future, pp. 205–268. The Federal Reserve Bank of Kansas City.

Edwards, S. 2006. “The U.S. Current Account Deficit: Gradual Correction or Abrupt Adjustment?” Journal of Policy Modeling, September, 2006

Eichengreen, B. 2003. "Three generations of crises, three generations of crisis models". Journal of International Money and Finance, Vol. 22(7), pp: 1089-1094.

Eichengreen, B., A. Rose and C. Wyplosz. 1996. " Contagious Currency Crises: First Tests," Scandinavian Journal of Economics, Vol. 98(4), pp: 463-84.

Frankel, J. A., and E. A. Cavallo. 2004. “Does openness to trade make countries more vulnerable to sudden stops, or less? Using gravity to establish causality”. NBER working paper # 10957.

Ghosh, A. R. and J. D. Ostry. 1995. "The Current Account in Developing Countries: A Perspective from the Consumption-Smoothing Approach". World Bank Economic Review, Vol. 9(2), pp: 305-333.

Gruber, J. and S. B. Kamin. 2005. “Explaining the Global Pattern of Current Account Imbalances,” mimeo. Board of Governors of the Federal Reserve System.

Heckman, J. J. 1981. “The incidental parameters problem and the problem of initial conditions in estimating a discrete time - discrete data stochastic process”. In C.F. Manski and D. McFadden (eds.). Structural Analysis of Discrete Data with Econometric Applications. Cambridge: MIT Press.

Hubbard, R. G. 2005. “A Paradox of Interest” Wall Street Journal, June 23.

Kraay, A. and J. Ventura. 2000. "Current Accounts In Debtor And Creditor Countries". The Quarterly Journal of Economics, Vol. 115(4), pp: 1137-1166.

Kraay, A. and J. Ventura. 2002. “Current Accounts in the Long and Short Run”. In M. Gertler and K. S. Rogoff (eds.) NBER Macroeconomics Annual.. MIT Press.

Lane, P. and G. M. Milesi-Ferretti. 2002. “Long Term Capital Movements” NBER Macroeconomics Annual 2001, MIT Press

Lane, P. and G. M. Milesi-Ferretti. 2003. “International Financial Integration” IMF Staff Papers, Vol. 50(1), pp: 82-113.

Lane, P. and G. M. Milesi-Ferretti. 2004. "International Investment Patterns," IMF Working Papers 04/134.

Lane, P. and G. M. Milesi-Ferretti. 2005. "A Global Perspective on External Positions," NBER Working Papers # 11589.

Lane, P. and G. M. Milesi-Ferretti. 2006. "The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities,1970–2004". The Institute for International Integration Studies Discussion Paper Series iiisdp126, IIIS.

Loayza, N., K. Schmidt-Hebbel and L. Servén. 2000. "What Drives Private Saving Across the World?," The Review of Economics and Statistics, Vol. 82(2), pp: 165-181.

Marquez, J. and L. Workman. 2001. "Modeling the IMF's Statistical Discrepancy in the Global Current Account" IMF Staff Papers, Vol. 48(3), pp: 499 -521

Mercereau , B. and J. Miniane. 2004. “Challenging the Empirical Evidence from Present Value Models of the Current Account”. IMF Working Papers 04/106.

Milesi-Ferretti, G. M. and A. Razin. 1996. “Sustainability of Persistent Current Account Deficits.” NBER Working Paper # 5467.

Mussa, M. 2003. “A Global Growth Rebound: How Strong for How Long?” Presentation given at Institute for International Economics, September 9, 2003

Nason, J. M. and J. H. Rogers. 2006. "The present-value model of the current account has been rejected: Round up the usual suspects". Journal of International Economics, Vol. 68(1), pp: 159-187.

Obstfeld, M. and K. Rogoff. 1996. Foundations of International Macroeconomics. MIT Press.

Obstfeld, M. and K. Rogoff. 2005. “Global exchange rate adjustments and global current account imbalances”. Brookings Papers on Economic Activity, Vol. 2005(1), pp: 67–146.

Ostry , J. D., C. Reinhart and M. Ogaki. 1995. "Saving Behavior in Low- and Middle - Income Developing Countries: A Comparison". IMF Working Papers 95/3.

Sachs, J.D. and A.M. Warner. 1995. “Economic Reform and the Process of Global Integration,” Brookings Papers on Economic Activity Vol. 1995(1), pp: 1–118.

Skidelsky , R. 2000. John Maynard Keynes, Volume 3: Fighting For Britain, 1937-1946. Macmillan Co. London

Taylor, John B. 2004. “The U.S. Current Account: Recent Trends and Policies” Keynote address at American Enterprise Institute Conference on Policy Challenges of Global Payment Imbalances. Washington, D.C. November 4, 2004

Ventura , J. 2003. “Towards a Theory of Current Accounts” The World Econo my, Vol. 26(4), pp: 483-512

Weisman, S. R. 2006. “Paulson Shows Talent for Deflecting Criticism”. International Herald Tribune, September 27.