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ON CURRENT ACCOUNT SURPLUSES AND THE CORRECTION OF GLOBAL IMBALANCES

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Resumen

Este artículo analiza la naturaleza de los ajustes externos en los países con cuenta corriente superavitaria. Se explora si un realineamiento de las tasas de crecimiento mundiales —con Japón y Europa creciendo más rápido y Estados Unidos, más lento—podría resolver los actuales desequilibrios globales. Los resultados principales se pueden resumir así: (a) existe una importante asimetría entre los déficits y superávits de cuenta corriente; (b) los superávits grandes muestran poca persistencia en el tiempo; (c) las reducciones abruptas del superávit son un fenómeno infrecuente; (d) Una disminución de un punto porcentual de crecimiento del PIB, en comparación con su tendencia de largo plazo genera un mejoramiento del saldo de la cuenta corriente de un cuarto de punto porcentual del PIB. Tomados en conjunto, estos resultados indican que un realineamiento del crecimiento global apenas haría un aporte modesto a la solución de los desequilibrios globales. Esto significa que, aun si se realinea el crecimiento mundial, es probable que el mundo requiera importantes movimientos cambiarios. Este análisis también sugiere que, para resolver los desequilibrios globales, será necesaria una reducción del (muy) abultado superávit de China.

Abstract

In this paper I analyze the nature of external adjustments in current account surplus countries. I ask whether a realignment of world growth rates -- with Japan and Europe growing faster, and the U.S. growing more slowly -- is likely to solve the current situation of global imbalances. The main findings may be summarized as follows: (a) there is an important asymmetry between current account deficits and surpluses. (b) Large surpluses exhibit little persistence through time. (c) Large and abrupt reductions in surpluses are a rare phenomenon. (d) A decline in GDP 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. Taken together, these results indicate that a realignment of global growth would only make a modest contribution towards the resolution of global imbalances. This means 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.

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1. INTRODUCTION

The United States has run an increasingly large current account deficit over the last few years. J. P. Morgan forecasts that in 2007 the deficit will reach almost one trillion dollars, or 7 percent of GDP. This unprecedented situation has generated concern among analysts and policymakers. Many argue that this deficit is unsustainable and that, at some point, it will have to decline. Much of the recent research on the issue examines whether the U.S. external adjustment will be gradual or abrupt, and how it will affect the (real) value of the dollar.[1]

Of course, one country's current deficit must be another country, or countries, surplus. Any discussion of the decline of the U.S. deficit therefore implies a discussion of the reduction of the rest of the world's combined current account surpluses. Federal Reserve Chairman Ben Bernanke made this point forcefully in a March 2005 speech—before he became Chairman—in which 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 argue that regional growth differentials are at the heart of the so-called global imbalances. The argument runs along the following lines: rapid growth in the United States 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 United States are a sign of strength; they reflect the fact that the United States has been the locomotive of global growth in the last few years. According to this view, a realignment of growth—with an increase in growth in Europe and Japan and a slowdown in the United States—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." The Secretary went on to say that the United States "has for a good number of years now been growing much faster than the major developed trading partners, Europe and Japan." For the imbalances to be corrected, Japan and Europe would have "to get the kind of growth on the consumption side that is going to make the difference."[4]

In the 1940s, Keynes was particularly interested in understanding the role of surplus countries in global adjustment. 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 of adjustment.[5] In recent years, however, very few empirical academic studies systematically analyze the process through which countries with large external surpluses have reduced their imbalances.

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

2. See Bernanke (2005). Some recent theoretical papers on this issue and inquire under what conditions the large U.S. deficit could be maintained over time. See, for example, Dooley, Folkerts-Landau, and Garber (2004, 2005). See also Caballero, Fahri, and Gourinchas (2006), Loayza, Schmidt-Hebbel, and Servén (2000), and De Gregorio (2005). On the global savings glut, see Clarida (2005a, 2005b) and R. G. Hubbard "A Paradox of Interest," *Wall Street Journal*, 23 June 2005. One of the few empirical papers on the savings glut is Chinn and Ito (2005). See Chinn and Lee (2005) for a vector autoregression (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. This argument is very general and refers to the relationship between investment, savings, and growth; no causality is implied in the above statement.

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

5. See, for example, the discussion in Skidelsky (2000, chap. 6), as well as the papers, reports, and memoranda by Keynes cited in that chapter.

This paucity of analysis contrasts with the case of current account deficits, which have been studied extensively.[6]

The purpose of this paper is to assess the historical evidence on 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 reduced their imbalances in the past. A particularly relevant issue is whether current account surpluses have historically registered large abrupt declines. Such abrupt surplus adjustments would be required if, as some fear, the United States—and other Anglo-Saxon countries, such as Australia, New Zealand, and the United Kingdom—experience a sudden stop of capital inflows and rapid current account reversals. I also investigate the connection between large surpluses and the business cycle and consider whether, as recently argued by U.S. Secretary of the Treasury Hank Paulson and others, an acceleration in the growth rates of the non-Anglo-Saxon advanced countries is likely to cause a decline in their surpluses and thus in global imbalances.

The rest of the paper is organized as follows. In Section 1, I analyze the distribution of current account deficits and surpluses over the last thirty-five years (1970–2004). The analysis focuses on the asymmetries between surpluses and deficits. Section 2 concentrates on the incidence of large and persistent current account surpluses. In Section 3, I examine the relationship between current account balances and the business cycle. In particular, I ask whether an acceleration in the growth rate (relative to the long-term trend) in advanced countries (other than the United States) is likely to reduce their surpluses. Section 4 explores the anatomy of large surplus adjustments. I use data for thirty-five years and over a hundred 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. This Section also assesses the concomitant behavior of exchange rates, growth, inflation, and interest rates. I use a battery of nonparametric tests to determine whether the behavior of these key variables has been statistically different in surplus-adjustment countries and a control group of countries. Finally, section 5 contains some concluding remarks and discusses directions for future research. The paper also has a data appendix.

2. 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. It is perfectly possible that the vast majority of countries run deficits, while 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—deficits have been financed. Are they 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 for which there is information, including —, transition, and emerging economies. To organize the discussion, I have divided the data into six groups: Africa (excluding North Africa); Asia; eastern Europe; industrialized (or advanced) nations; Latin America and the Caribbean; and the Middle East and North Africa. The

6. The sum of all deficits is equal to the sum of all surpluses, so knowing how all deficit countries behave in the aggregate reveals exactly how the sum of all surplus countries behaves in the aggregate. This, however, is not a very interesting proposition.

7. As is discussed below, the actual sum of balances has become significantly different from zero in recent years.

data set covers 160 countries in the 1970–2004 period. With over 4,200 observations, this is the largest data set available for empirical work on current account balances. Table A1 in the appendix details the availability of data on the current account, both for the complete sample and 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 a population of over half a million and per capita income above $500 in 1985 purchasing power parity (PPP) terms. Also, the analysis presented in this paper primarily uses 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 over 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. First, current account balances in Asia experienced a deep change in the period under study. Until 1998, both the mean and median reflected the fact that most countries in that region posted large current account deficits and were capital importers. Another way of saying this is that until that year the Asian nations had positive foreign savings. The situation changed drastically after the 1997–98 Asian debt crises. In 1990–95, the mean current account balance in Asia was a deficit of 3.3 percent of GDP; in 1999–2004, it was a surplus of 2.4 percent. This represents a remarkable current account reversal in excess of 5 percent of GDP!

Second, current account balances also underwent important changes in most other country groups. The Middle East recorded surpluses, on average, after 1999. These became more accentuated in 2005–06, as a result of the higher oil prices.

Third, the magnitude of the external adjustment in the Latin American and Caribbean countries is particularly noticeable from the data on median balances (table 2). The current account deficit declined from 5.3 percent of GDP in 2002 to barely 1.0 percent of GDP in 2004.

Finally, the data in tables 1 and 2 also reveal a difference in the mean and median behavior of the advanced countries. In the last few years, the mean current account over GDP balance has been a small surplus—below 1 percent—in the industrial nations. The median 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, the number of deficit countries does not have to equal 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. Only 27.6 percent of the countries in the full sample experienced surpluses. Moreover, the percentage of surplus countries has changed significantly through time. This proportion was at its highest level of the last twenty-five years in 2003 and 2004, at 38.6 percent and 37.8 percent, respectively. This pattern indicates that the growing U.S. deficit has been financed by an increasingly large array of countries. The last time the United States experienced large deficits (1985–87), the proportion of surplus nations was much lower, ranging from 25.0 percent to 27.9 percent. In many ways this is not surprising, as the magnitude of the U.S. deficit has been significantly larger in the last few years than in 1985–87. As table 3 shows, the main difference between these two periods lies with the Asian countries: in 1985–87 less than 25 percent of the Asian nations ran a current account surplus; in 2002–04 almost 70 percent of the Asian nations ran a surplus.

These results do not 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 over the last few years.[8] Moreover, since these balances are gathered by independent country agencies, there is bound to be a statistical discrepancy. Thus, while the sum of all current account balances should add up to zero, it is highly unlikely that for any given year the sum of these balances would actually be identical to zero. The size of the statistical discrepancy has been growing, however, and it has become increasingly negative since 1997 (IMF, 2002). According to the 2003

8. 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.

World Economic Outlook, the (negative) discrepancy exceeded 3 percent of the world's imports in 2002. This might be called the mystery of the missing current account surpluses. Marquez and Workman (2001) argue that it may reflect a number of factors, including cross-country differences in the lags with which actual transactions are recorded; asymmetric valuations of the same transaction in the two countries involved; and misreporting of investment income.

3. 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 Ventura (2000, 2003) and Edwards (2002, 2004), countries tend to experience short-term deviations from their long-run sustainable current account levels.[9] 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 very 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* is an index that takes the value of one if, in a particular year, a country's surplus is among its region's 25 percent highest surpluses; the index takes a value of zero otherwise. *High Surplus 2* takes the value of one if, in a particular year, a country's surplus is among its region's 10 percent highest surpluses; it takes a value of zero otherwise.

Table 4 lists the countries that have had persistently high surpluses. I define persistently high surpluses as occurring when 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 reports the results for High Surplus 1, while the second column covers High Surplus 2. As the table shows, forty-one countries had persistently high surpluses according to the High Surplus 1 definition, and while only seventeen did so according to the more stringent High Surplus 2 definition. Some interesting facts emerge from this table. First, the number of large countries that have had persistently large surpluses (using the High Surplus 1 definition) is very small. Germany and Japan are the only advanced nations that make the list, and China and Russia are the only large emerging and transition countries. Second, many oil-producing countries run persistently high surpluses, particularly in the years following a major oil price increase. Third, many East Asian countries had persistently large surpluses in after the 1997–98 debt crises. Finally, only a handful of countries have truly maintained long-term high surpluses. 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 very persistent high surpluses is consistent with the notion that to finance the increasingly large U.S. deficit, more and more small and medium-sized countries have to run surpluses. Second, the lack of persistency suggests that the majority of countries that do run large surpluses do so for a rather limited period of time. After posting these large surpluses, these countries go through an adjustment process that reduces their surpluses to more "normal"—or sustainable—levels. An important question, which I address in section 4 of this paper, involves 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 how other key macroeconomic variables behave during the adjustment and whether macroeconomic variables such as inflation, interest rates, exchange rates, and growth behave differently in countries undergoing a surplus adjustment than in non adjustment countries.

9. 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 by both foreign and domestic investors.

3.2 The Persistence of High Surpluses: Some Econometric Results

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:

$$\text{High}_{j,t} = \alpha + \sum \beta_k \text{High}_{j,t-k} + \gamma X_{j,t} + \varepsilon_{jt}, \quad (1)$$

where High_{jt} is a dummy variable that takes a value of one if country j has a high surplus in period t (using the two different high surplus measures defined above); X_{jt} refers to other covariates including time, country, and region fixed effects. The error term, $\varepsilon_{jt,}$ is given by a variance component model: $\varepsilon_{jt} = \nu_j + \mu_{jt}$. The variable ν_j is independent and identically distributed (i.i.d.) with zero mean and variance σ_ν^2; μ_{jt} is normally distributed with zero mean and variance $\sigma_\mu^2 = 1$. My main interest lies with the β_k coefficients on lagged high surpluses: I want to find 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. To address this issue, I also estimated equations such as equation (1) for deficit countries.[10] Table 5 reports the resulting estimated marginal effects, which capture the change in the probability of a high surplus (deficit) in period t given a high surplus (deficit) in period $t - k$.[11]

These results suggest that the degree of persistence of high deficits is larger than that of high surpluses, especially for the stricter definition of high imbalances (High Surplus 2). Beyond the first lag, the point estimates of the marginal effects are very small, and in many cases they are not statistically significant. This confirms the results in table 4 indicating that the degree of persistence of large current account imbalances tended to be low in the last thirty-five years.

3.3 Large and Persistent Surpluses in Absolute Terms

The results presented above on persistently high deficits were constructed using the ratio of the current account balance to GDP. 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. The table differs significantly with table 4, which measures surpluses as a proportion to GDP. As expected, large countries have a stronger presence in table 6: France and Italy are now classed as having highly persistent surpluses, and Japan's streak of high surpluses appears to be much longer than in table 4. The most important difference between the two tables is that according to table 6, China has run a persistently high surplus for more than a decade. This suggests that, as many have argued for some time now, an adjustment in China's large external surplus will be an important component in solving current global imbalances.

4. Current Account Surpluses and the Business Cycle

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 investment. This means that countries that experience an investment boom will undergo a deterioration of their current account. Likewise, countries that experience an increase in savings will tend to post larger surpluses. This savings-investment perspective is complementary to the more popular view that focuses on trade flows, net incomes from abroad, and international net transfers. The advantage of concentrating on the savings-investment relationship is that it allows analysts to focus on the way in

10. The computation of the High Deficit 1 and High Deficit 2 variables parallels that of the two high surplus variables.

11. The marginal effects, *dF*/*dx*, in table 5 have been computed for a discrete change in the dummy variables from 0 to 1, and they 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.

which changes in aggregate demand—and in policies that affect aggregate demand, for that matter—will affect current account balances.

A practical implication of the savings-investment perspective involves the role of differences in regional growth rates on current account balances. As described earlier, the analysis runs along the following lines. The rapid growth in the United States over the past few years has been associated with an increase in U.S. investment (over savings), while slower growth in Europe and Japan has been associated with higher savings (relative to investment) in those parts of the world.[12] According to this view, global imbalances are largely a reflection of these growth differentials. Far from reflecting a serious problem, the large current account deficits in the United States are a sign of strength, in that they reflect the fact that the United States has been the locomotive of global growth in the last few years. An implication of this perspective is that an international realignment of growth (with an increase in growth in Europe and Japan and a slowdown in the United States) would play an important role in correcting global imbalances.[13] 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 U.S. economy than in Japan and Europe*."[14]

In a 2004 speech, then Undersecretary of the Treasury John B. Taylor discussed the relationship between savings, investment, growth differentials, and global imbalances:

> "[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, emphasis added).

Regarding the correction of global imbalances, in the same speech Taylor identified 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 throughout the world… [will] reduce external imbalances*." (Taylor 2004, emphasis added).

In 2003, former IMF Chief Economist Michael Mussa wrote the following:

> "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, 2003, emphasis added).

Many authors address 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, so 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

12. This very general argument refers to the relationship between investment, savings, and growth. No causality is implied in the above statement.

13. Implicit in this view is the notion that growth realignment would require higher savings (and lower investment) in the United States and higher investment (and lower savings) in Europe and Japan (and maybe other parts of non-China Asia).

14. See R. Chote, "IMF: U.S. Slowdown Now Inevitable," *Financial Times*, 21 April 1999.

(Obstfeld and Rogoff, 1996). Empirically, however, this prediction of the theory has been systematically rejected by the data.[15] Typical analyses that regress 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 equals 45 percent of GDP, and the steady-state debt-to-GDP ratio is 15.[16]

The rejection by the data of the intertemporal (or present value) model of the current account has generated an intense debate among international economists. Some argue that there is a group of "usual suspects" that explain this outcome (Nason and Rogers, 2006); others hold that the problem resides in the low power of traditional statistical tests (Mercereau and Miniane, 2004). Kraay and Ventura (2000, 2003) and Ventura (2003) propose 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. 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 (that is, bank loans). Kraay and Ventura further argue that when short-run adjustment costs in investment are added to the analysis, the amended intertermporal model tracks 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 do not 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 affects growth.[17] For instance, if the source of stronger growth is an expansion in exports, the current account balance will tend to improve. If, on the other hand, growth accelerates because of an expansion in household expenditure, the current account is likely to deteriorate.

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 how 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 in Europe and Japan closer to its long-term trend—or, for that matter, above this trend—will affect global imbalances. The analysis also provides an indication of the long-run relationship between a country's net external position and its current account balance.[18]

15. See, for example, Aizenman (1983), Ogaki, Ostry, and Reinhart (1995), Gosh and Ostry (1995), and Nason and Rogers (2006).

16. Obstfeld 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.

17. See, for example, Obstfeld and Rogoff (1996) and Kraay and Ventura (2000).

18. Recent attempts to estimate current account regressions for a panel of countries include Calderón, Chong, and Loayza (2002), Chinn and Prasad (2003), Chinn and Lee (2005), Chinn and Ito (2005), and Gruber and Kamin (2005).

4.1 The Empirical Model

The empirical analysis starts from 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 idea that in equilibrium the ratio of the net external position (NEP) to GDP (or to some other aggregate) has to stabilize at some level.[19] The relationship between the equilibrium and stable ratio of NEP to GDP—which I denote as γ—and the sustainable current account to GDP balance (SCA) may be written as follows:[20]

$$\text{SCA} = \gamma \left(g^T + \pi \right), \tag{2}$$

where $(g^T + \pi)$ is the nominal growth rate of trend GDP, g^T is the long-run trend real growth rate of GDP, and π is the long-run steady-state inflation rate. If a country's equilibrium NEP-to-GDP ratio is negative ($\gamma < 0$), then the country is said to be a net debtor, and it will run a current account deficit. If the country is a global net creditor, γ will be positive, and the country will run a sustainable current account surplus.[21] Current account regressions, then, should incorporate this sustainability condition and provide estimates on the long-run relationship between the current account balance and the NEP-to-GDP ratio. The empirical analysis presented in this section is based on a two-equation formulation:

$$CA_{j,t} = \alpha_0 + \alpha_1 \left(g_j^T - g_{j,t-1} \right) + \phi NEPGDP_j^* + \sum \beta_i Xi_{j,t-k} + \varepsilon_{j,t} \; ; \tag{3}$$

$$g_j^T = \psi + \sum \delta_i Zi_j + \sum \theta_i Vi_j + \xi_j . \tag{4}$$

These equations use the following notation:

- $CA_{j,t}$ is the current account balance relative to GDP, in country j in year t (a positive number denotes a current account surplus).
- $g^T_{j,t}$ is country j's long-term trend per capita growth rate, and $g_{j,t-1}$ is country j's actual per capita growth rate in period $t - 1$.
- The term $(g_j^T - g_{j,t-1})$ is thus a measure of the growth gap: if the country in question is growing below trend, this term is positive; if it is expanding at a rate that exceeds the long-term trend, the term is negative. This term captures the effect of the business cycle on the current account balance. If economic activity slows down, $(g_j^T - g_{j,t-1})$ will become positive. There are, of course, many reasons for $(g_j^T - g_{j,t-1})$ to be positive or negative, but the formulation in equation (3) does not distinguish between the specific factors driving $(g_j^T - g_{j,t-1})$. In that sense, this analysis is very general. In long-run equilibrium, however, $(g_j^T - g_{j,t-1}) = 0$. An important question refers to the sign of coefficient α_1. If an acceleration in growth (relative to long-term trend) results in a deterioration of the current account balance, the estimated coefficient of $(g_j^T - g_{j,t-1})$—that is, the coefficient α_1—will be positive. In this paper, however, I am interested not only in the sign of α_1, but also in the magnitude of the coefficient. In equation (3), as in most panel data equations, the coefficients are common for all regions and countries. In section 3.4 on robustness, however, I present results for estimations that 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 the country is a net debtor. In the estimation of equation (3), its coefficient should be positive; it

19. See Milesi-Ferreti and Razin (1996) and Edwards (2005a, 2005b).

20. See Edwards (2005a) for a detailed analysis along these lines that incorporates the dynamic effects of changes in γ.

21. Strictly speaking, the net international investment position refers to all assets and liabilities held by nonnationals. In that sense, the concept extends beyond debt to include equities and FDI.

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 $Xi_{j,t-k}$ in equation (3) are other determinants of the current account, such as changes in the real exchange rate, the fiscal balance over GDP, and changes in the international terms of trade. These $Xi_{j,t-k}$ are defined such that they equal zero in long-run steady-state equilibrium.
- The error term, $\varepsilon_{j,t}$, is given by given by $\varepsilon_{j,t} = \nu_j + \mu_{j,t}$, where ν_j is an i.i.d. country-specific disturbance with zero mean and variance σ_ν^2; and $\mu_{j,t}$ is normally distributed with zero mean and variance $\sigma_\mu^2 = 1$.

Equation (4) is the equation for the long-run (trend) growth rate of real GDP. The Zi_j are economic determinants, while the Vi_j are institutional determinants of long-term growth. ξ_j is an error term assumed to be heteroskedastic. In determining the specification of equation (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, $(g_j^T - g_{j,t-1}) = 0$ and $Xi_{j,t-k} = 0$, it follows that

$$\mathrm{CA}_j^{\mathrm{Long\,run}} = \alpha_0 + \phi \mathrm{NEPGDP}_j^* . \tag{5}$$

This is 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 ϕ coefficients will help provide an estimate for the sustainable current account balance, for different values of NEPGDP_j^*. Also, if $\alpha_0 = 0$, the estimated coefficient ϕ is the average value of $(g^T + \pi)$. In the base run, I estimate a common ϕ for all countries; in section 3.4, however, I report different ϕ for different regions.

The specification in equations (3) and (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 the long-run current account balance does converge toward $\phi \mathrm{NEPGDP}_j^*$ in the long run. Another difference is that while I have included the deviations of (per capita) growth from the long-term trend, Chinn and Prasad (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). Like Chinn and Ito (2005), Gruber and Kamin (2005) incorporate institutional variables directly into the estimation of their current account equations. They also include dummy variables for crisis periods. Another important difference between this paper and Gruber and Kamin (2005) has to do with the growth terms: the relevant growth variable in equation (3) is deviations of growth from trend, while Gruber and Kamin (2005) focus on the change in per capita growth differentials.

4.2 Estimation and Basic Results

I estimated the system contained in equations (3) and (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 (3) using both random- and fixed-effects methods. In estimating equation (4) for long-run per capita growth, I followed the now-standard growth literature (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 GDP growth rate (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 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 considerations; 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 difficult, however, to obtain data on this desired ratio. In the basic specification, I proxied $NEPGDP_j^*$ by the mean value of the actual net external position to GDP, for the period 1970–2004. To check the robustness of the results, I estimated regressions using alternative definitions of $NEPGDP_j^*$; these exercises are discussed in subsection 3.3.

Following the empirical literature on the current account, I included the four $Xi_{j,t}$ covariates in the estimation of equation (3) (see the appendix for data sources).

- A terms-of-trade shock, defined as the percentage change in the relative price of exports to imports, lagged one period. A positive (negative) number represents an improvement (deterioration) in the terms of trade. 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 over a three-year span, lagged one period. The real exchange rate is defined 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. The coefficient is expected to be negative.
- To check for robustness, I considered alternative specifications and variable definitions. The results show that the main findings from the base run are not significantly affected (see sections 3.3 and 3.4).

In the regression analysis reported in this section, I focus on medium-sized and large countries; these are defined as countries with a GDP in 1995 of at least US$52 billion.[22] The sample includes forty-one countries over the period 1974–2004. Of these, twenty are advanced nations and twenty-one are emerging or transition countries. The size of the sample was determined by data availability; not all countries have data for all variables (see the appendix for a list of countries). I estimated equation (3) for three alternative samples within the group of large countries: advanced, nonadvanced, and all countries.

The base estimates are presented in table 7, where the first three columns report the results for random effects and the last three columns those for fixed effects. Robust standard errors were used to estimate the *z* statistics. 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 random and fixed effects. The point estimates for the coefficient of $(g^T + \pi)$ are very similar across samples and estimation techniques, ranging from 0.180 to 0.225. These estimates indicate that a decline in the per capita GDP growth rate of, say, 1 percentage point below the long-term trend would result in an increase in the current account surplus of at most one quarter of a percentage point of GDP.

These results have interesting implications for the analysis of global imbalances. In the case of Japan, for example, my estimates indicate that per capita growth was, on average, 3.3 percentage points below trend in 2003–04. Had Japan's growth been on trend, its current account surplus would thus have been 0.54–0.68 percent of GDP lower than it actually was. GDP growth was also below trend in other large industrial countries in 2003–04: in Germany and Italy, it was 1.0 percent below trend, and in France, it was 0.6 percent below trend. Section 3.5 presents a more detailed analysis of the effects of a realignment of national growth rates on global imbalances.

22. Below I discuss the results obtained when all countries—large and small—are included in the sample.

The estimates in table 7 also imply that improvements in the terms of trade result in larger (smaller) surpluses (deficits); this effect is particularly clear in the advanced countries. An accumulated real depreciation similarly 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.[23] The estimated coefficients of $NEPGDP_j^*$ range from 0.064 to 0.070, and they are similar for the advanced nations and the emerging and transition countries. The results in this table suggest that for advanced countries with a long-run net asset position of 30 percent of GDP, the sustainable current account balance is a surplus of 1.9 percent of GDP.[24] For an (average) emerging nation with a negative net external position of 40 percent of GDP (that is, $NEPGDP_j^* = -40$), the long-run sustainable deficit will, on average, equal 1.1 percent of GDP.[25]

4.3 Alternative Definitions of $NEPGDP_j^*$

For the estimations presented in table 7, the long-run equilibrium $NEPGDP_j^*$ was proxied by the average ratio of net external assets to GDP over the sample period. In this subsection, I report results obtained using an alternative measure of $NEPGDP_j^*$. I followed a two-step procedure to generate this new variable: first, I used long-term averages to estimate a cross-section equation for $NEPGDP_j^*$; second, 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. I considered the following covariates when specifying the equation: (a) the degree of trade openness, measured as exports plus imports over GDP (this coefficient is expected to be positive); (b) the ratio of government consumption to GDP (the expected coefficient is 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 per capita GDP growth rate; (f) a measure of the degree of financial openness, calculated as the sum of total external liabilities and total external assets (which include debt, equities, FDI, and international reserves) relative to GDP (the expected coefficient is positive); (g) inflation, measured as the average percentage rate of change of CPI (the expected coefficient is negative); (h) the initial level of per capita GDP (the expected coefficient is positive); and (i) regional dummy variables.

Table 8 reports the results obtained from the estimation of this long-run cross-country regression of the net external position, for a sample of 130 countries; the first column excludes regional dummies, while the second column includes them. As shown by the between-group R squared, 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 economic growth rate have a higher NEP–to-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 standard errors. 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. The estimated coefficients of NEPGDP_STAR are lower than 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, versus 0.011 in table 9. This implies that

23. Since $NEPGDP_j^*$ is constant across time for each country, its coefficient cannot be estimated using fixed effects.

24. This assumes that all other variables are given at their mean. The estimations in table 7 use the point estimate for advanced nations.

25. The sustainable surplus or deficit includes the intercept. These computations assume that in the long run, the fiscal deficit is equal to zero. The calculated sustainable balances will be different under alternative assumptions.

according to table 9 the (average) sustainable current account balance for the emerging and transition countries is smaller than previously suggested. A possible interpretation for this result—and one that I investigate in subsection 3.4—is that this aggregate estimate is averaging (very) different estimates for the different regions.

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

4.4 Potential Endogeneity and Other Robustness Checks

This subsection addresses potential endogeneity issues and reports the results from a number of robustness checks. The main results reported above stand up to this scrutiny.

4.4.1 Potential endogeneity

One of the covariates in the current account equation (3) is the (lagged) accumulated change in the real exchange rate. This variable could potentially be influenced by the perceived (future) evolution of the current account.[26] To assess this potential source of endogeneity I re-estimated equation (3) using an instrumental variables (IV) 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 decline in capital inflows, lagged one period; a similar index that measures the incidence of sudden declines in inflows in other regions, also lagged one period; changes in the terms of trade, lagged two periods; inflation, lagged two periods; initial (1970) per capita GDP; population growth; and regional dummy variables. The results obtained from this IV random-effects estimation are reported in table 10. In most respects, the results are very similar to those reported above. The estimated coefficients of $NEPGDP_j^*$ and $(g_j^T - g_{j,t-1})$ 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 IV random-effects estimates in table 10 and the results in tables 7 and 9 is that the coefficient of the accumulated change in the real exchange rate is no longer significant for advanced countries. A possible interpretation of this result is that the measure of real exchange rate changes is a poor proxy for real exchange rate misalignment.

4.4.2 Alternative samples

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

4.4.3 Alternative specifications

I considered alternative specifications of the current account equation (3). In particular, instead of the accumulated change in the real exchange rate, I used a variable that captures the deviation of an estimate of the equilibrium real exchange rate and the one-period-lagged actual real exchange rate. 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.

26. Since the change in the real exchange rate is lagged one period, it is a predetermined variable. It may still be correlated with the error term, however, if there is serial correlation.

4.4.4 Region-specific coefficients

The results reported above were obtained under the assumption of common coefficients for all countries. This, of course, need not be the case. This subsection reports on estimations using different regional coefficients for $NEPGDP_j^*$ and $(g_j^T - g_{j,t-1})$, which I obtained by interacting regional dummies with these two variables. The results are reported in table 11. The coefficients for the different variables continue to have the same signs as in the previous tables, and they continue to be significant at conventional levels. The point estimate of $(g_j^T - g_{j,t-1})$, however, is somewhat smaller than what was reported earlier. Two of the regional dummies interacted with $NEPGDP_j^*$ are significant: namely, Latin America and Asia. The results in table 11 suggest that the coefficient of net external assets for the Latin American region is not different from zero; the chi-squared 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 $(g_j^T - g_{j,t-1})$. 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.

4.4.5 Interacting growth deviations with net external assets

Kraay and Ventura (2000) raise the issue of whether the effects of different shocks on the current account depend on the country's net external position. To explore this possibility in the current context, I included in the estimation of equation (3) a variable that interacts $(g_j^T - gj,t_{-1})$ 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.

4.5 Growth Realignment in Japan and the Euro Area

As pointed out above, many analysts and government officials argue that a realignment of regional growth—with Japan and the Euro area growing faster and the United States experiencing a slowdown—would contribute significantly toward solving current global imbalances. In this subsection, I use the econometric estimates reported above to investigate the extent to which global imbalances would be reduced if growth moved toward a more "normal" level in a number of key countries. In particular, I assume that per capita growth increases in Japan and Germany, two countries with a combined surplus of US$270 billion that year. I assume that Japan's growth increases by 3.3 percent relative to its 2003–04 average, while Germany's growth increases by 1.0 percent. 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, which posted small deficits in 2005, increase their growth by 1.0 percent each.[27]

Using the estimated coefficients from the equations in table 7, the acceleration in growth in Japan and the most important euro area countries would result in a surplus reduction of merely US$40 billion. Of this amount, US$27 billion would correspond to a surplus reduction in Japan, and US$13 billion to a surplus reduction in the euro zone. Finally, if U.S. growth declines toward its long-term trend, the U.S. deficit would fall by US$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 United States is in the neighborhood of 3.6 percent of GDP, the needed correction would add up to approximately US$350 billion. These results suggest, then, that global imbalances will not be corrected without a significant adjustment in China and the oil-exporting countries. Moreover, these

27. Germany, France, and Italy's GDP add up to the bulk of the Euro area's GDP.

results support the view that (significant) exchange rate realignments will be needed to correct global imbalances.[28]

5. THE ANATOMY OF MAJOR AND RAPID SURPLUS ADJUSTMENTS

Since the mid-1990s, a number of authors have analyzed episodes of sudden stops of capital inflows and current account reversals.[29] These studies focus on the abrupt decline of international financing and the resulting rapid turnaround in the current account, from a large deficit to a moderate deficit (or even to a surplus). Until now, there have been no equivalent studies on episodes of large and sudden adjustments in surplus countries. This section aims to fill this void by exploring the anatomy of surplus adjustment episodes, or large reductions in current account surpluses over short periods of time. In particular, I am interested in analyzing how key macroeconomic variables—including inflation, GDP growth, interest rates, and real exchange rates—behave in the period surrounding these surplus adjustments. I define surplus adjustments in two alternative ways. First, a *2 percent surplus adjustment* is defined as a reduction of a country's current account surplus by at least 2 percent of GDP in one year. In addition to this requirement, the initial surplus has to be of 3 percent of GDP or higher. Second, a *3 percent surplus adjustment* is defined as an accumulated reduction of a country's current account surplus in at least 3 percent of GDP in three years, from an initial surplus of 3 percent 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 full sample, as well as for six groups of countries: advanced economies, Latin America and the Caribbean, Asia, Africa, the Middle East and North Africa, and eastern Europe. The 2 percent surplus adjustment has been a more common phenomenon than the 3 percent surplus adjustment. The overall incidence for the former is 6.6 percent; it is only 3.0 percent for the latter. For both definitions, the highest incidence is in the Middle East and North Africa, with 19.7 percent and 10.2 percent. This reflects the important role played by Middle Eastern oil-producing countries in the generation of current account surpluses in the last thirty-five years. The industrial countries, in contrast, have had the lowest occurrence of surplus adjustments in our sample.

5.1 Surplus Adjustments and Exchange Rates

The issue of whether surplus adjustment episodes (as defined above) have historically been associated with large exchange rate appreciations is particularly relevant within the context of current policy debate on global imbalances.[30] Figure 1 presents 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 in that year. The indexes are tracked from three years prior to the current account surplus adjustment to three years after the adjustment.[31] In this figure, a lower value of the index reflects a real exchange rate appreciation.[32] The figure has three panels: one for advanced countries, one for large countries (defined as having a GDP in the top 25 percent of the distribution in 1995), and one for the full sample. In the figure, the large and advanced countries samples appear to undergo a visible real exchange rate appreciation in

28. See Blanchard, Giavazi, and Sa (2005), Obstfeld and Rogoff (2005), and Edwards (2005a, 2005b).

29. For recent papers, see Calvo, Izquierdo, and Mejía (2004) and Frankel and Cavallo (2004). For capital flows and crises, see Eichengreen (2003).

30. A related question has been asked of current account reversal episodes. On the relationship between depreciations and crises, see Eichengreen, Rose, and Wyplosz (1996).

31. For the 3 percent surplus adjustment episodes, period zero corresponds to the first year of the three-year adjustment period.

32. 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.

the period surrounding the surplus adjustment episodes, while the full sample shows no significant changes in the period around the surplus adjustment episodes.

Figure 2 shows the behavior of the (median) nominal effective exchange rate index. As before, a decline in the index represents a real appreciation. In this case, the picture is rather mixed. The full sample shows a slight nominal depreciation, the advanced economies register a small appreciation, and the large countries display no clear pattern.

To gain further insights on the nature of these surplus adjustment episodes, I estimated chi-squared statistics to test whether the medians in these figures were statistically different at different points in time. The tests were performed for three comparisons: three years after the adjustment relative to three years previous; one year after the adjustment relative to one year previous; and three years after the surplus adjustment relative to one year before the adjustment. The results are reported in table 13 for the 2 percent surplus adjustment episodes and in table 14 for the 3 percent surplus adjustment episodes. For the real exchange rate, the null hypothesis of equal medians is rejected in seven out of the nine cases in this table. The magnitude of the real exchange rate adjustment may be quite sizable according to these computations. For instance, for the 2 percent surplus adjustment episodes, the median appreciation between one year before and three years after the adjustment is 12.6 percent ($\chi^2 = 8.25$; p value = 0.004).

5.2 Surplus Adjustments, Interest Rates, Inflation, and Real Growth

Figures 3 and 4 present before-and-after data for real interest rates and inflation for the two definitions of surplus adjustments. These figures, together with the chi-squared statistics in tables 13 and 14, 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 per capita GDP growth during the period surrounding the surplus adjustment episodes. Once again, there is very little action here, and no clear pattern of behavior can be extracted from the analysis. This impression is largely supported by the results from the chi-squared tests reported in tables 13 and 14.

5.3 Surplus Adjustments and Terms of Trade

Figure 6 investigates whether the surplus adjustment episodes identified in this paper have been associated with a sudden deterioration in the terms of trade. All three samples exhibit 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. Despite these changes in the terms of trade, the data on the formal tests do not support the hypothesis that surplus adjustment episodes have been driven by terms-of-trade shock (see the chi-squared tests in tables 13 and 14).

5.5 Current Account Surplus Adjustments versus Deficit Reversals

The picture that emerges in figures 1–6 on the evolution of key macroeconomic variables in the period surrounding surplus adjustment episodes is not very sharp, and it does not provide a clear-cut pattern of behavior. As one would expect from theory, there is some evidence of 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. 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 (2005a, 2005b), current account reversal episodes have historically been characterized by sharp depreciations, significantly higher real interest rates, and very significant declines in the growth rate 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.

6. CONCLUDING REMARKS

This paper has addressed several issues regarding current account surplus. First, I identified the most important regularities of surpluses during the last thirty-five years, focusing on asymmetries between surpluses and deficits. Second, I explored whether large surpluses have been persistent and, if so, whether their degree of persistence has been higher than for large deficits. Third, the paper assessed the relationship between current account balances and the business cycle and, fourth, the relationship between external balances and countries' net external position. Fifth, I analyzed the likelihood that a realignment of world growth rates—with Japan and Europe growing faster and the United States growing more slowly—would solve the current situation of global imbalances. This issue is a particularly important because a number of analysts and U.S. government officials have argued that a normalization of growth would help solve global imbalances. Finally, I dimensioned the anatomy of significant and large surplus adjustments, defined as a decline in the surplus of at least 2 percent of GDP in one year.

The analysis generated a number of results. Current account deficits and surpluses exhibit an important asymmetry. During the last thirty-five years only 27.6 percent of all countries, on average, have run surpluses in a given year. This percentage, however, increased significantly in the last few years of the sample. Almost 40 percent of countries posted surpluses in 2003–04.

The most important recent changes in current account balances have occurred in Asia, where the current account reversal exceeded 5 percent of GDP between 1997 and 2003–04.

Large surpluses exhibit very little persistence through time, and very few large countries have had persistently large surpluses-to-GDP ratios. The Middle East displays the most persistent surpluses, which largely reflects the role of oil-exporting countries. Large surpluses are slightly more persistent than large deficits, but the degree of persistence of both types of imbalance 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 percent and 6.6 percent 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 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 with 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 1 percentage point decline in growth relative to the long-term trend results in an improvement in the current account balance—that is, 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 area growing faster and the United States moderating its growth—would only make a modest contribution toward resolving 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. Finally, the analysis also suggests that a reduction in China's very large surplus will be needed if global imbalances are to be resolved.

APPENDIX

Supplemental Tables

Table A1. Current Account Balances as a Percentage of GDP in the World Economy: Data Availability, 1970–2004

Number of observations

Year	*Africa*	*Asia*	*Eastern Europe*	*Industrial countries*	*Latin America and the Caribbean*	*Middle East and North Africa*	*All countries*
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

Table A2. Definition of Variables and Data Sources

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 a 2% reduction in surplus in one year; a 3% reduction in surplus accumulated over 3 years	Author's elaboration based on data on 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*

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Table 1. Current Account Balances as a Percentage of GDP in the World Economy: Means, 1970–2004

Year	*Africa*	*Asia*	*Eastern Europe*	*Industrial countries*	*Latin America and the Caribbean*	*Middle East and North Africa*	*All countries*
1970	–3.01	–0.26	n.a.	0.05	–7.51	–6.66	–2.81
1971	–6.01	–0.64	n.a.	0.26	–5.53	–2.50	–2.21
1972	–4.44	–2.43	n.a.	1.38	–3.78	3.79	–0.68
1973	–5.10	–1.36	n.a.	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

Source: Author's calculations, based on World Bank data.
n.a. Not available.

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

Year	*Africa*	*Asia*	*Eastern Europe*	*Industrial countries*	*Latin America and the Caribbean*	*Middle East and North Africa*	*All countries*
1970	–1.90	–0.90	n.a.	0.40	–4.07	–5.90	–1.10
1971	–7.53	–1	n.a.	0.27	–4.6	–7.25	–1.04
1972	–0.93	–1.55	n.a.	0.71	–1.45	–1.10	–0.41
1973	–4.40	–0.70	n.a.	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	–0.7	–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

Source: Author's calculations, based on World Bank data.
n.a. Not available.

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

Year	*Africa*	*Asia*	*Eastern Europe*	*Industrial countries*	*Latin America and the Caribbean*	*Middle East and North Africa*	*All countries*
1970	0.333	0.200	n.a.	0.625	0.000	0.000	0.292
1971	0.000	0.200	n.a.	0.600	0.167	0.250	0.321
1972	0.000	0.333	n.a.	0.727	0.167	0.500	0.433
1973	0.000	0.333	n.a.	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

Source: Author's calculations, based on World Bank data.
n.a. Not available.

Table 4. Countries with Persistently High Current Account Surpluses, 1970–2004[a]

High Surplus 1		*High Surplus 2*	
Region and country	*Years*	*Country*	*Years*
Industrial countries			
Belgium	1989–2001	Germany	1986–89
Finland	1995–2004	Luxembourg	1995–99
Germany	1984–90	Malta	1975–81
Japan	1983–89	Norway	2000–2004
Luxembourg	1995–2004	Switzerland	1991–2001
Malta	1972–82		
Netherlands	1972–77; 1981–8;5 1987–91; 1993–99		
Norway	1980–85; 1994–97; 1999–2004		
Switzerland	1981–2004		
United Kingdom	1980–83		
Latin America and the Caribbean			
Guyana	1986–89	Suriname	1987–90; 1992–95
Panama	1987–90	Venezuela	1999–2004
Suriname	1987–90; 1992–95		
Trinidad and Tobago	1975–78; 1992–96; 1999–2003		
Uruguay	1988–91		
Venezuela	1994–97; 1999–2004		
Asia			
China	1994–97	Hong Kong, China	1984–90
Fiji	1985–88	Papua New Guinea	1993–96
Hong Kong, China	1970–78; 1983–94; 2001–04	Singapore	1989–92; 1994–2004
Korea, Rep.	1986–89		
Malaysia	1998–2003		
Papua New Guinea	1992–96		
Singapore	1988–2004		
Africa			
Botswana	1985–89; 1991–2003	Botswana	1985–89; 1991–99
Chad	1980–84	Gabon	1979–84; 1994–97; 1999–2003
Gabon	1978–84; 1994–97; 1999–2003	Gambia, The	1987–90
Gambia, The	1984–92	Lesotho	1990–94
Lesotho	1980–84; 1989–94	Libya	1977–80
Liberia	1979–82		
Libya	1977–80; 1994–97		
Mauritania	1995–2001		
Namibia	1990–2004		
Nigeria	1989–92; 1999–2004		
South Africa	1977–80; 1985–93		
Swaziland	1986–91		
Zimbabwe	1986–89		
Middle East and North Africa			
Kuwait	1975–90; 1993–2004	Kuwait	1980–90; 1993–2004
Saudi Arabia	1971–74		1998–2004
Eastern Europe			

Russian Federation	1998–2004	Russian Federation
Ukraine	1999–2004	
Other		
Samoa	1995–98	

a. The two measures of high surpluses are defined as follows. *High Surplus 1* is an index that takes the value of one if, in a particular year, a country's surplus is among its region's 25 percent highest surpluses; the index takes a value of zero otherwise. *High Surplus 2* takes the value of one if, in a particular year, a country's surplus is among its region's 10 percent highest surpluses; it takes a value of zero otherwise.

Table 5. Persistence in Current Account Imbalances: Marginal Effects from Variance Component Probits[a]

	High 1		*High 2*	
Explanatory variable	*Surplus*	*Deficit*	*Surplus*	*Deficit*
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)
Summary statistic				
Probability	0.122	0.788	0.025	0.034
No. observations	3415	3415	3415	3415
No. groups	161	161	161	161

* The null hypothesis is rejected at the 10 percent level.
** The null hypothesis is rejected at the 5 percent level.
*** The null hypothesis is rejected at the 1 percent level.
a. The dependent variable is high surplus 1 and 2 and high deficit 1 and 2, as indicated. The estimation model is a variance component probit, with the following explanatory variables: lags of the dependent variable, time fixed effects, country fixed effects, and region fixed effects. Test t statistics are in parentheses.

Table 6. Countries with Persistently High Current Account Surpluses, Convertible Currency, 1970–2004[a]

Region and country	*Years*
Industrial countries	
Belgium	1991–97
France	1995–2001
Germany	1973–78; 1983–90
Italy	1994–98
Japan	1981–2004
Netherlands	1981–99
Norway	1999–2004
Switzerland	1984–2004
Latin America and the Caribbean	
El Salvador	1979–84
Trinidad and Tobago	1990–96; 1999–2003
Venezuela, RB	1999–2004
Asia	
China	1994–2004
Hong Kong, China	1970–80; 1982–94
Papua New Guinea	1993–97
Singapore	1988–2004
Africa	
Botswana	1985–89; 1991–2001
Ethiopia	1993–97
Gabon	1978–84; 1999–2003
Namibia	1990–2004
Nigeria	1999–2004
South Africa	1985–94
Swaziland	1986–91
Middle East and North Africa	
Kuwait	1977–81; 1983–90; 1993–2004
Saudi Arabia	1971–77; 2000–04
Eastern Europe	
Russian Federation	1992–2004
Ukraine	1999–2004

a. A high surplus is defined as in table 4, except that the surplus is measured in convertible currency instead of relative to GDP.

Table 7. The Current Account and the Business Cycle: Variance Component Regressions, 1970–2004[a]

	Random effects			*Fixed effects*		
Explanatory variable	*Large countries*	*Industrial countries*	*Nonindustrial countries*	*Large countries*	*Industrial countries*	*Nonindustrial 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)*
Accumulated change in 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	0.07	—	—	—
	(9.06)***	(5.54)***	(5.66)***			
Summary statistic						
R^2	0.2377	0.3627	0.184	0.0628	0.0822	0.0995
No. observations	1001	522	479	1001	522	479
No. groups	41	20	21	41	20	21

* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.
*** Statistically significant at the 1 percent level.
a. The dependent variable is the current account over GDP. The sample includes all countries with a GDP in 1995 of at least US$52 billion, resulting in forty-one countries over the period 1974–2004. Test t statistics are in parentheses.

Table 8. Net External Position Regressions, 1970–2004[a]

Explanatory variable	*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	–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)***
Summary statistic		
R^2	0.1747	0.2104
Between R^2	0.3986	0.4555
No. observations	2912	2904
No. groups	130	129

* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.
*** Statistically significant at the 1 percent level.
a. The dependent variable is the net external position over GDP. The estimation model is a between-effects estimator. The sample and sample period are defined in table 5, but are constrained by data availability. Test t statistics are in parentheses.

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

Explanatory variable	*Large countries*	*Industrial countries*	*Nonindustrial 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)
Accumulated change in 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)**
Summary statistic			
R^2	0.1611	0.391	0.1446
No. observations	949	488	461
No. groups	41	20	21

* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.
*** Statistically significant at the 1 percent level.

Table 10. The Current Account and the Business Cycle: Variance Component Instrumental Variable Regressions, 1970–2004[a]

Explanatory variable	*Large countries*	*Industrial countries*	*Nonindustrial countries*
Accumulated change in REER	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)***
Summary statistic			
R^2	0.0916	0.3706	0.1069
Between R^2	0.5953	0.6783	0.7941
No. observations	924	475	449
No. groups	40	19	21

* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.
*** Statistically significant at the 1 percent level.

a. The dependent variable is the current account over GDP. The estimation model is instrumental variables (IV) with random effects, using the following instruments: an index that measures the proportion of countries in the country's region that were subject to a sudden decline in capital inflows, lagged one period; a similar index that measures the incidence of sudden declines in inflows in other regions, also lagged one period; changes in the terms of trade, lagged two periods; inflation, lagged two periods; initial (1970) per capita GDP; population growth; and regional dummy variables. The sample includes all countries with a GDP in 1995 of at least US$52 billion, resulting in forty countries over the period 1974–2004. Test t statistics are in parentheses.

Table 11. The Current Account and the Business Cycle: Variance Component Regressions with Interactions, 1970–2004[a]

Explanatory variable	*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)*
Accumulated change in RER	0.008
	(4.01)***
Net external position / GDP	0.055
	(8.09)***
Growth gap / GDP interactions with	
Latin America and the Caribbean	0.029
	(0.33)
Asia	0.306
	(3.39)***
Africa	0.523
	(2.75)***
Middle East and North Africa	0.037
	(0.3)
Eastern Europe	–0.081
	(–0.84)
Net external position / GDP interactions with	
Latin America and the Caribbean	–0.054
	(–7.58)***
Asia	0.038
	(2.36)**
Africa	–0.036
	(–0.85)
Middle East and North Africa	–0.004
	(–0.22)
Eastern Europe	–0.001
	(–0.02)
Summary statistic	
R^2	0.3031
Between R^2	0.6068
No. observations	949
No. groups	41

* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.
*** Statistically significant at the 1 percent level.
a. The sample includes all countries with a GDP in 1995 of at least US$52 billion, resulting in forty-one countries over the period 1974–2004. Test t statistics are in parentheses.

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

Sample group	*2% surplus adjustment*	*3% surplus adjustment*
Industrial countries	2.51	1.64
Latin America and the Caribbean	5.41	2.15
Asia	6.93	3.43
Africa	6.3	2.51
Middle East and North Africa	19.69	10.2
Eastern Europe	5.62	2.43
All countries	6.63	3.02

Table 13: Two Percent Surplus Adjustment Episodes: Nonparametric Tests[a]

Period of comparison and	*All countries*		*Industrial countries*		*Large countries*	
explanatory variable	χ^2	*Obs.*	χ^2	*Obs.*	χ^2	*Obs.*
t = +3 versus t = –3						
Real exchange rate	3.609*	233	0	22	2.45	80
Nominal exchange rate	35.645***	258	0.727	22	9.561***	82
Real interest rate	0.0554	147	0.09	13	3.431*	49
GDP per capita growth	6.109**	251	0	22	3.574*	81
Inflation	2.865*	238	0.727	22	0.05	80
Terms of trade	0.2243	164	0.09	13	0.015	61
t = +1 versus 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 per capita 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 versus 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 per capita 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

* The null hypothesis is rejected at the 10 percent level.
** The null hypothesis is rejected at the 5 percent level.
*** The null hypothesis is rejected at the 1 percent level.
a. The null hypothesis is that the medians are equal.

Table 14. Three Percent Surplus Adjustment Episodes: Nonparametric Tests[a]

Period of comparison and explanatory variable	*All countries*		*Industrial countries*		*Large countries*	
	χ^2	*Obs.*	χ^2	*Obs.*	χ^2	*Obs.*
t = +3 versus 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 per capita	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 versus 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 per capita	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 versus 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 per capita	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

* The null hypothesis is rejected at the 10 percent level.
** The null hypothesis is rejected at the 5 percent level.
*** The null hypothesis is rejected at the 1 percent level.
a. The null hypothesis is that the medians are equal.

Figure 1. Real Exchange Rate
Index: adjustment year = 100

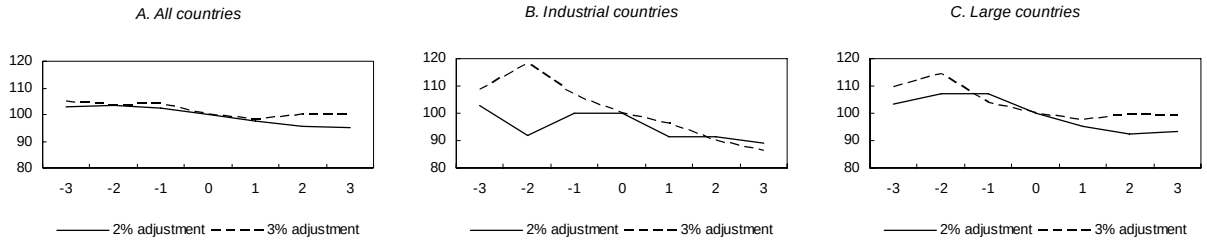


Figure 2. Nominal Exchange Rate
Index: adjustment year = 100

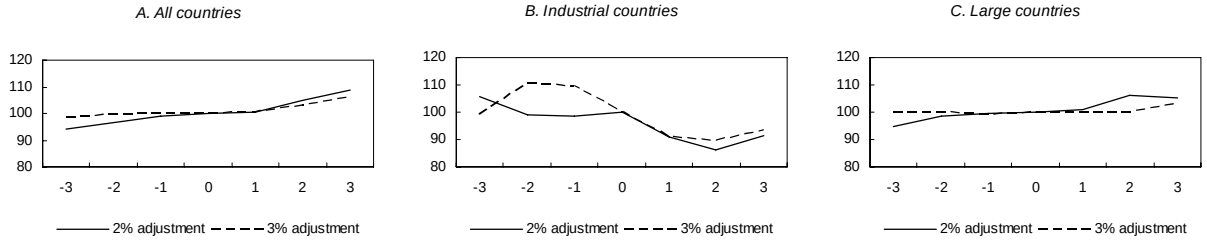


Figure 3. Real Interest Rate
Index: adjustment year = 100

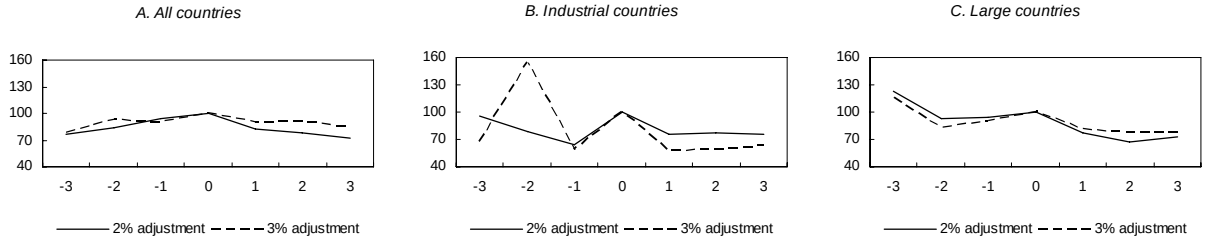


Figure 4. Inflation
Annual percent change

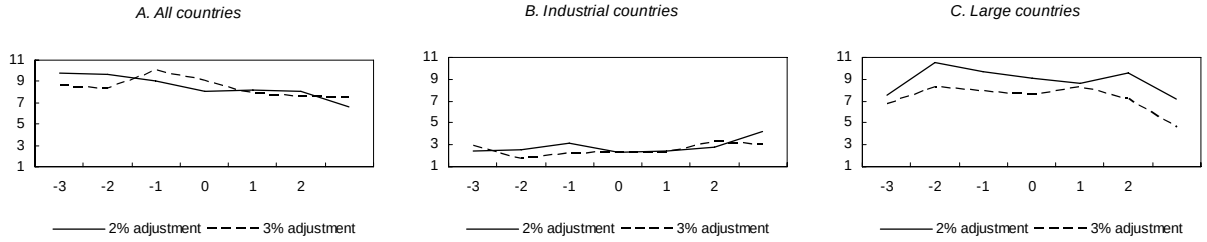


Figure 5. Per Capital GDP Growth
Annual percent change

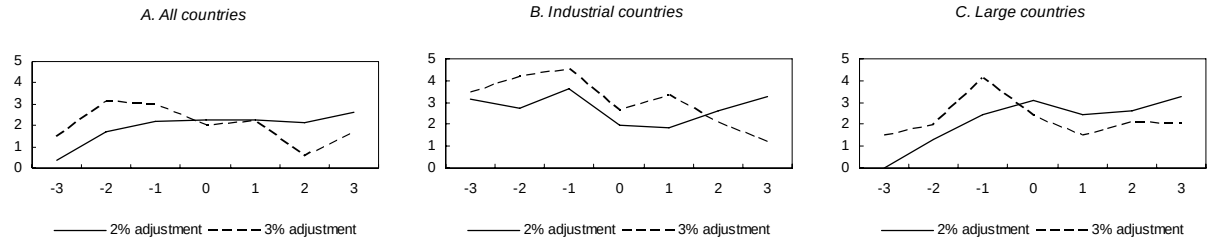
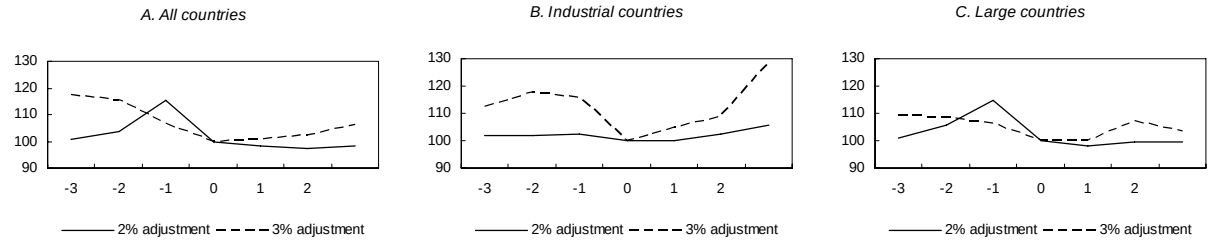


Figure 6. Terms of Trade
Index: adjustment year = 100



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