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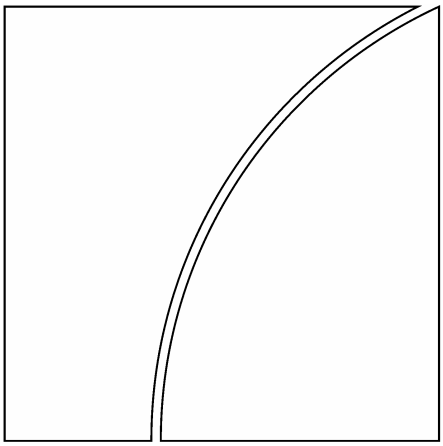

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Current account adjustment and capital flows

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Abstract

This paper examines episodes of current account adjustment in industrial countries over the past 30 years. We find that they were typically associated with a sizeable slowdown in domestic growth and a large exchange rate depreciation. There was no discernable change in the nature of capital flows in the period just prior to an adjustment, with the possible exception of non-residents' holdings of currency and deposits. This suggests that a current account adjustment may be an endogenous event – responding to the resolution of domestic imbalances – rather than an exogenous event where the size of the current account deficit itself precipitates the adjustment in the domestic economy and the exchange rate. Econometric evidence suggests that global developments trigger the adjustment, possibly because they trigger the unwinding of the domestic imbalances. We find that the bulk of the ex post adjustment of the financial account was in private sector flows, primarily on the part of foreign investors. Finally, we document some notable differences in the adjustment of the current account in the United States in 1987 compared with that observed in the other episodes.

Contents

1. Introduction[1]

How do current account balances adjust? Are the adjustments disruptive to the macroeconomy or can they proceed relatively smoothly? What role do financial flows play in the adjustment process? This paper addresses these questions by examining 28 episodes of current account adjustments and the associated financial flows in 21 industrial countries over the past three decades.

Our paper is similar to the analysis in Milesi-Ferretti and Razin (1998, hereafter MFR), who examine current account reversals in a large cross-section of countries. In contrast to MFR, we focus on current account reversals in industrial countries, because it appears that there are substantive differences in the nature of adjustment between industrial and emerging market economies, particularly in terms of the behaviour of financial flows. Freund (2000) also focuses on industrial economies, but we extend her analysis to highlight the role that changes in financial flows play in the adjustment process.

First, we investigate the possible determinants of current account reversals, where a reversal is defined as a significant reduction in the size of a current account deficit. We examine the role of domestic macroeconomic factors – such as output growth and the real effective exchange rate – and external factors such as world growth and global interest rates. In addition, we ask whether financial factors, and in particular the composition of capital flows, help predict the timing of adjustments. We present graphical evidence and then estimate a Probit model of the likelihood of reversals.

Second, we examine the adjustment mechanisms. We show that the exchange rate and output growth contribute significantly to the process of adjustment, and document the change in domestic saving and investment patterns that accompany the adjustment. We then examine the behaviour of financial flows during the episodes. We find that the more volatile types of flows, which tend to be primarily influenced by interest rate differentials, generally adjust the most. Moreover, the adjustment is driven to an important extent by the behaviour of private sector foreign investors, rather than local residents.

We caution that these results imply nothing about causality. That is, they do not imply that a large current account imbalance, in and of itself, brings about the adjustment in the real economy and financial flows. Instead, one plausible explanation of our graphical evidence is that during adjustment episodes the current account position is purely a reflection of other domestic macroeconomic imbalances. The adjustment in the current account coincides with the unwinding of these other imbalances. By contrast, our econometric results highlight that current account dynamics to a large extent result from contemporaneous global factors.

These apparently different results can be reconciled in two alternative ways. First, macroeconomic imbalances might be drivers of a current account adjustment but the available sample size does not allow us to find supportive econometric evidence. Alternatively, while external imbalances can reflect imbalances elsewhere in the economy, it takes an external shock to trigger a correction of those imbalances. Given our small sample size, we cannot distinguish between these alternatives.

Finally, we also examine the adjustment of the US current account in the late 1980s, to see whether it differs from adjustment episodes in other countries. We show that while the 1987 reversal of the US current account deficit shared some features with the episodes in other industrial countries, there were also some important differences, notably the role played by official sector capital flows.

2. Theories and empirical studies of the determination and sustainability of the current account

A number of approaches have been taken to assess the determinants and the sustainability of current account positions. This section reviews the contributions that are most relevant for the analysis

[1] We would like to thank Claudio Borio, Tony Richards, Camilo Tovar and William White for useful comments on an earlier draft and Pat McGuire for helpful discussions. Michela Scatigna provided excellent research assistance. The views expressed in this paper are those of the authors and do not necessarily represent those of the Bank for International Settlements or the Reserve Bank of Australia.

undertaken in our paper. For more comprehensive overviews of the literature, see Knight and Scacciavillani (1998) and Calderon et al (2002).[2]

While the intertemporal approach to the current account is a standard framework for analysis (Sachs (1982), Razin (1994), Obstfeld and Rogoff (1995)), it is not particularly well suited for assessing current account sustainability. In the intertemporal framework, the current account balance is the outcome of forward-looking savings and investment decisions by optimising agents and hence is definitionally sustainable. Moreover, the empirical support for this framework is at best mixed (see eg Ghosh (1995), Ghosh and Ostry (1995), Nason and Rogers (2003)).

A related approach to assess sustainability has been to examine empirically the determinants of the current account across countries, where the possible determinants are derived from the theoretical literature including intertemporal models (Khan and Knight (1983), Debelle and Faruqee (1996), Chinn and Prasad (2003) and Calderon et al (2002)). Sustainability can then be assessed by comparing observed current account positions to those predicted by the model. Those current account positions that differ significantly from the prediction of the models can be regarded as unsustainable. This literature has highlighted the role played by demographic factors, the stage of development and fiscal policy as long-run influences on the current account. In the short run, the real exchange rate, the output gap and the terms of trade are found to be relevant, as well as international factors such as global growth and interest rates.

A more direct approach to sustainability has been taken by Milesi-Ferretti and Razin (1996), building on the seminal work by Sachs (1981). They examine a list of indicators of sustainability for a number of industrial and emerging market countries that experienced persistent external imbalances. They identify factors such as exchange rate policy, trade openness, the health of the financial system, and the levels of savings and investment as important indicators of sustainability. However, they conclude that it is difficult to identify a specific threshold of sustainability, beyond which a current account deficit tends to reverse. Other papers have explored this issue by examining various case studies including Australia (Cashin and McDermott (1996)), ASEAN countries (Ostry (1997)), Eastern Europe (Roubini and Wachtel (1998) and McGettigan (2000)) and Latin America (Calvo et al (1993), Corbo and Hernandez (1996)).

These approaches can be characterised as ex ante assessments of current account sustainability. Another literature has focussed on ex post assessments, that is, examining episodes of large current account adjustment. In the emerging market context, this is closely related to the issue of sudden stops (see eg Dornbusch, Goldfajn and Valdes (1995); Calvo (1998, 2004); Calvo and Reinhart (2000). Milesi-Ferretti and Razin (1998, 2000) look at a large number of episodes of current account reversals in emerging market countries since the early 1970s. They show that both domestic variables (the current account balance, openness, the level of reserves) and external variables (terms of trade shocks, US real interest rates, US growth) help to predict the occurrence of current account reversals.

In developed countries, capital markets tend to be deep and liquid, meaning that any adjustment tends to occur more smoothly through price changes (primarily changes in the exchange rate) rather than through marked changes in quantities. The ability of developed countries to issue liabilities in domestic currency also eases the adjustment process. Furthermore, the real economy may be more diversified in developed countries, and/or institutions may be better able to cope with the required adjustment.

Freund (2000) extends Milesi-Ferretti and Razin's (1998, 2000) analysis to industrial countries. Looking at 25 episodes of current account reversals that occurred between 1980 and 1997, she identifies a 5% current account/GDP threshold beyond which current account reversals typically tend to happen. The reversals are characterised by a marked slowdown in output growth and a 10–20% real depreciation of the domestic currency, as well as an increase in real export growth, a decline in domestic investment, and some levelling off in the budget deficit and the net international investment position. Freund concludes that current account adjustments in industrial countries tend to be driven by cyclical factors.

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[2] As the US current account deficit has widened over the past few years, a substantial literature has arisen assessing its sustainability and the possible nature of the adjustment that might accompany any reversal. Obstfeld and Rogoff (2004) argue that the US current account is now definitely unsustainable, while Dooley, Folkerts-Landau, and Garber (2003, 2004) take the opposite view. Mann (2002) provides an excellent summary of the issue.

This mode of analysis tends to ignore the issue of causality. Is the current account reversal just the net outcome of macroeconomic imbalances elsewhere in the economy? If this were so, a reversal of the current account may just reflect the (possibly rapid) unwinding of those imbalances rather than playing any causal role per se in the macroeconomic adjustment that accompanies the reversal of the current account. In other words, the current account can be regarded as purely a by-product of other macroeconomic outcomes and hence the timing of a reversal is driven by the factors that are contributing to those macro outcomes.

An additional problem with these approaches for examining the question of the sustainability of the current account is that they have tended to ignore the financial (capital) account. The literature tends to ignore the fact that the current account and the capital account are jointly determined, and that the causality may run from the capital account to the current account, rather than vice versa. While the above approach may predict that a particular current account position appears to be unsustainable on the basis of real economy factors, the market may continue to provide the necessary finance for a large current account position, perhaps because of expectations of high future rates of return on investment. The timing of any reassessment of these expectations of future returns may be inherently difficult to predict.

Therefore, to shed some light on the question of causality and the role played by financial flows in the adjustment process, in this paper, we extend Freund's analysis of current account adjustments to examine the behaviour of the capital account, as well as other developments in the domestic macroeconomy to assess the presence of imbalances in the domestic economy.

In recent work, Lane and Milesi-Ferretti (2004a) have also focussed on the role played by financial flows between industrial countries. They stress the importance of valuation effects, in addition to flows, in determining external portfolio adjustment. In the presence of large external assets and liabilities, these valuation changes coming from exchange rates or other asset price fluctuations (such as changes in stock prices) can have very large effects on international portfolios and hence in turn can affect the need for (or the magnitude of) exchange rate adjustments. Since the focus of our paper is on flows rather than stocks, the valuation issue is less relevant for our analysis.[3]

3. Current account dynamics, macroeconomic factors and the capital account

In this paper we look at 21 industrial countries during the period 1974–2003.[4] We follow MFR and Freund (2000) and focus on episodes of sharp and persistent current account adjustments, which are defined in terms of four conditions. First, the current account deficit should exceed 2% of GDP prior to the adjustment. Second, the average deficit should decline by at least 2% of GDP over three years. Third, it should be reduced by at least a third. Fourth, the largest deficit during the five years after the peak should not be wider than the smallest deficit during the three years before the peak. These conditions imply that the reduction in the current account deficit was sustained. Using these criteria, we identify 28 such episodes in 17 countries.[5] Eight countries experienced more than one sharp current account correction over this sample period. Four countries – Germany, Japan, Netherlands,

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[3] One channel through which valuation effects may matter for flows is through their impact on portfolio allocation decisions, and hence portfolio investment decisions. However, since we are interested in observing the ex-post flows, we do not focus on this channel.

[4] All 21 countries are included also in Freund's (2000) sample, which covers the period 1980–1997 and in addition includes Hong Kong, Israel, Korea and Singapore. Adding these episodes to our sample does not change our results. MFR examine 60 developing countries for the period 1971–1992.

[5] Our sample has 28 episodes of current account adjustment, comprising; Australia (1989, 1999); Austria (1977, 1980); Belgium (1981); Canada (1981; 1993); Denmark (1986); Finland (1991); France (1982); Greece (1985); Ireland (1981); Italy (1974, 1981, 1992); New Zealand (1974, 1984); Norway (1977, 1986); Portugal (1981); Spain (1976, 1981, 1991); Sweden (1980, 1992); United Kingdom (1974, 1989); United States (1987). This compares to 25 episodes in Freund (2000) and 72 episodes in MFR (1998). Episodes included in our sample but not in Freund's are: Austria in 1977, Australia in 1999, Italy in 1974, New Zealand in 1974, Norway in 1977, Spain in 1976 and the United Kingdom in 1974. Freund (2000) also includes four episodes in countries that are not in our sample (one episode each in Hong Kong, Israel, Korea and Singapore).

and Switzerland – had mostly positive current account balances over this period and did not experience a reversal.

We follow MFR and Freund (2000) and address the following questions: when did current account adjustments happen? Can adjustments be predicted by changes in the behaviour of macroeconomic variables? What is the role of macroeconomic variables in the mechanism through which the current account deficit was typically reversed?

As mentioned above, one important difference between our analysis and that in Freund (2000) is that we also investigate the dynamics of the financial account during these current account adjustments. Do patterns of private financial flows and the mix between private and official flows have any information content for the sustainability of external imbalances and the timing of the adjustment process? Second, what types of financial flows change most during periods of current account adjustments? This is relevant for understanding the consequences a current account reversal could have for the domestic financial system.

We address these questions first with an event analysis and then a regression-based analysis. In the latter, focusing exclusively on episodes of current account corrections could introduce a problem of sample selection bias. Therefore, in contrast to Freund, we include in our econometric work, episodes in which the current account balance widened sharply but without reversing in the following years. We define these episodes as cases in which, over a two year period, the average deficit changed by at least 2% of GDP and by at least a third, without, however, narrowing markedly in the following years (ie this excludes conditions three and four used to identify current account reversals). Our sample includes 22 such episodes.[6]

3.1 Current account adjustments in industrial countries since 1973: an event analysis

We first present graphical evidence on the behaviour macroeconomic variables and the current account during the 28 episodes. The graphs report averages over all the episodes for each of the five years before and five years after the current account trough.

Macroeconomic factors

The graphical analysis reveals several interesting common patterns. First, there is evidence of a threshold for the current account deficit as a fraction of domestic output, in terms of determining the timing of adjustment. Similar to the evidence presented in Mann (1999), Freund (2000) and Chinn and Prasad (2003), we find that on average the current account tended to adjust when it approached levels around 4–5% of domestic GDP in these episodes (Graph 1). Note that this is conditional on the adjustment actually taken place, that is, 'false positives' where the current account deficit reached this level but did not subsequently reverse are not included in this sample. Consistent with Freund (2000), we do not find clear-cut evidence of a threshold for the ratio of the net international investment position (NIIP) to GDP, although it seems that current account reversals typically occurred when this ratio was around 20%.[7]

Second, consistent with Freund (2000) and MFR, the process of current account adjustment was generally accompanied by both a depreciation of the domestic currency and a slowdown of domestic growth. On average, the real effective exchange rate declined by about 4% during current account reversals, suggesting that the contribution of the real exchange rate to the current account adjustment tended to be small. However, the magnitude of the exchange rate correction varied considerably across episodes, and in some cases the domestic currency fell sharply. The depreciation typically started two years before the current account deficit reached its peak and continued for another year. This is consistent with a J-curve effect, whereby the trade balance initially worsens as the currency starts to depreciate, before improving after about three years.

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[6] The 22 episodes are Australia (1974, 1981, 1995); Austria (1995); Canada (1975,1995); Denmark (1995); Finland (1980); Germany (1980, 1992); Greece (1990, 1996, 2000); Italy (2000); Norway (2000); Portugal (1988, 2000); Spain (2000); Sweden (1977); United Kingdom (1999); United States (2000).

[7] The change in the NIIP is clearly influenced by valuation changes, which Lane and Milesi-Ferretti's (2004b) have found to be very important, especially in those current account corrections that were associated with large exchange rate changes.

Third, current account corrections were generally characterised by a marked slowdown of domestic growth in the two years around the current account deficit reversal. On average, GDP growth slowed by two percentage points. One to three years after the reversal, growth rates trended upwards again.

Fourth, the cyclical slowdown was typically accompanied by a reduction in investment, starting around the time of the peak of the current account deficit and continuing during the following three years (Graph 2). The behaviour of saving was mostly driven by changes in the public-sector saving position, which on average declined as a fraction of GDP, with the notable exception of the United States in 1987. In all other episodes, therefore, there is no evidence that the improvement in the current account balance was associated with an improvement in the fiscal balance.

Fifth, inflation on average declined by several percentage points during current account corrections, although there was significant variation across episodes (Graph 3). One can interpret the inflation profile as an indicator of the presence, and then resolution, of macroeconomic imbalances. The delay in the reduction in inflation reflects the lag between the slowdown growth and inflation, as well as the possible inflationary impact of a depreciating exchange rate. Coinciding with higher inflationary pressures, credit growth tended to rise before the current account started to adjust and to peak one year later (Graph 4). Rapid credit growth may be regarded as an indicator of financial imbalance (Borio and Lowe (2002)).

Finally, short-term interest rates generally appeared to follow a hump-shaped pattern, indicating that the slowdown in growth and investment was associated with a monetary tightening as inflationary pressures rose but that monetary policy was subsequently eased as the economy slowed and inflation declined.

These developments however imply nothing about causality, which has often been implicit in some of the previous literature. One plausible explanation for these results is that they are consistent with the argument that, on average, an unsustainable current account position is purely a reflection of other macroeconomic imbalances. As an economy booms, domestic demand growth begins to exceed domestic output growth resulting in a widening in the trade deficit and thereby the current account deficit. The boom in domestic demand is associated with a rapid pace of credit growth, and a rise in inflation. Monetary policy is tightened to slow the growth in domestic demand and borrowing, and to counter the rise in inflation. This policy is eventually successful resulting in a marked slowdown in the domestic economy (sometimes a recession). The combination of a slowdown in the economy and the resultant easing in monetary policy reduces the attractiveness of the domestic economy as an investment destination, resulting in a depreciation of the exchange rate. The fiscal position deteriorates as a result of the standard operation of fiscal stabilisers.

Hence the evolution of the current account balance may simply be a summary statistic of the developments in the macroeconomy, and reflects the presence of imbalances in the domestic economy, rather than a causal factor. That said, this analysis does not imply that all large current account deficits reflect domestic imbalances. Those that do not reverse are unlikely to do so, and may instead reflect other domestic developments which are attractive to foreign investors leading to large capital inflows, the composition of which we turn to next.

The capital account

The next set of graphs shows the patterns of private financial flows and the share of official flows during episodes of current account adjustments. An inspection of the averages of each category of financial flows across the 28 episodes during the five years before the current account trough suggests that the compostion of capital flows do not have much predictive power for the timing or the characteristics of current account adjustments (Graph 5).[8] There is little evidence of a systematic change in trend just prior to the beginning of the period in which the current account adjustment takes place, including for official flows. The only exception is non-residents' holdings of currency and deposits, which typically peaked one year prior to the start of the current account adjustment.

[8] The use of annual averages complicates this analysis. It is conceivable that around the time of the adjustment there is a spike in capital flows which is quickly reversed, which will be smoothed away by our use of averaging.

A second key question is what types of financial flows change most during current account adjustments. In this respect, the 28 historical episodes exhibit several interesting common patterns (Graph 5). (Note these are ex post adjustments and do not have predictive power.)

First, the more volatile types of flows, which tend to be primarily influenced by interest rate differentials, generally adjusted the most. More specifically, after rising as the current account deficit grew, holdings of currency and deposits and debt typically declined markedly during the correction (Table 1). While the more stable foreign direct investment (FDI) flows – both outflows and inflows – exhibited a similar pattern, these changes were less sizeable. For their part, portfolio equity flows, which are commonly perceived as volatile, on average did not change noticeably.

Second, the adjustment was driven to an important degree by the behaviour of non-residents. Foreign holdings of domestic deposits, foreign holdings of domestic debt and loans by foreigners to domestic residents changed markedly during the current account adjustments. These categories of flows generally rose before the turning point of the deficit and tended to fall afterwards. By contrast, only one category of financial flows originated by residents (domestic holdings of foreign deposits) changed systematically during these episodes. Thus, for industrial countries, there is little evidence of domestic capital flight – an important contrast to the experience of emerging markets.

Third, the changes in current account financing were largely in private flows. Holdings of reserves by the home country also tended to change, primarily as a result of intervention in the foreign exchange market in support of the domestic currency and/or valuation effects. For all countries that experienced substantial current account adjustments, with the notable exception of the United States, purchases of domestic assets by foreign public sector entities were not sizeable and hence did not play a significant role in these adjustments.

Finally, in most cases the changes in the composition of financial flows described above were orderly, again in contrast to the emerging market experience. There is not much evidence of any substantial disruption to domestic financial markets, beyond that resulting from the resolution of domestic imbalances. One exception was the current account adjustment in Sweden in 1992. This was accompanied by a sharp withdrawal of currency and deposits by foreign residents, in the order of 10% of GDP, and an equally sharp fall in foreign loans, although arguably this was a consequence of the banking crisis that itself was a result of domestic imbalances.

3.2 Econometric evidence

In this section we undertake a more formal analysis of the adjustment process than the graphical analysis in the previous section. To do so, we proceed in three steps. We first determine the likelihood a country experiences a current account deficit of reasonable size. Then we estimate a Probit model to test whether macroeconomic or financial variables can predict the timing of a reversal. Finally we examine the effect of reversals on output growth and the exchange rate.

Explaining the likelihood of substantial current account deficits

First, we estimate a Probit model that explains the probability of experiencing a substantial current account deficit, defined as being at least 2% of GDP. (This is the first of our conditions for defining current account reversals.) We choose our explanatory variables based on the findings of literature on the determinants of the current account across countries. As discussed above, empirical studies have highlighted the role of country-specific variables (eg the real exchange rate, output growth, or the fiscal position) and exogenous factors such as global growth or interest rates.[9]

The dependent variable is a dummy that takes the value 1 if the current account deficit is below 2% of GDP, and 0 otherwise. The explanatory variables include the current account balance lagged one period and country-specific macroeconomic variables (the real effective exchange rate, investment, the fiscal balance, and real GDP growth) taken as averages over the three years preceding the current

[9] See eg Calderon et al (2002).

account adjustment. The current account balance, investment and the fiscal balance are expressed as fractions of GDP.

In order to test the influence of changes in the financial account, we also include non-residents' holdings of currency and deposits over GDP. While this variable has not been used in the literature, our event analysis highlighted that its behaviour tends to change markedly one year before current account adjustments (Graph 6). We therefore use one lag of this variable in our regression analysis to capture the relationship between changes in the composition of the capital account and the current account.

Following MFR, we also include contemporaneous exogenous variables such as world growth, proxied by growth in the OECD countries, and the US short-term interest rate (a proxy for global interest rates).[10] The last two variables are meant to capture the effect of external factors that the literature has found to influence the current account, independently of the role of domestic variables.

We estimate the model with annual data for a panel of 21 countries over the sample period 1974–2002. The results, reported in Table 2, highlight that both macroeconomic and capital account variables help to explain the likelihood that a country experiences a significant current account deficit, defined as at least 2% of GDP. Given the past current account balance, an appreciation of the domestic currency in real effective terms or faster domestic output growth make it more likely that the a country will experience a current account deficit in the following years, as one would expect from the standard effects of these variables on the trade balance. We also find that an increase in the share of more volatile components of the financial account is associated with a lower likelihood of large current account deficits. The exogenous variables are also found to matter. Faster global growth and higher world interest rates reduce the likelihood of a current account deficit. Overall, the model fits the data well. It correctly predicts 75% of the 183 cases in which the current account deficit is at least 2% of GDP and 89% of the other 344 cases when it is not.

We conclude from this exercise that beyond a threshold of 2% of GDP, a current account deficit is influenced by both domestic and global macroeconomic factors. The current deficit of this size also tends to be associated with a capital account which has a higher share of the more volatile components of the capital account.

Explaining reversals

We then undertake similar analysis to MFR and estimate a multivariate Probit model to test whether macroeconomic and capital account variables help predict current account adjustments (recall that our sample focuses only on developed countries). The Probit model explains the probability that a current account adjustment occurs at time t in terms of averages of macroeconomic variables between t-3 and t-1, variables measuring the composition of capital flows at time t-1, and exogenous variables at time t. As in our regression explaining the likelihood of substantial current account deficits, the macroeconomic variables include GDP growth, changes in the real exchange rate, and the current account to GDP ratio. The exogenous explanatory variables at time t include the terms of trade and the US short-term interest rate.[11]

We run the Probit over a sample that includes the 28 episodes of current account adjustments, as well as 22 episodes in which the current account deficit widened sharply but without narrowing markedly thereafter. The dependent variable takes the value 1 if a reversal occurs and 0 otherwise.

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[10] In theory there is a problem of an adding up constraint, since every country's current account deficit cannot deteriorate when world growth slows. In practice, this constraint appears not to matter, as our results do not change when we express domestic output growth as deviation from world output growth (proxied by OECD growth).

[11] The terms of trade are meant to capture the Harberger-Laursen-Metzler effect, according to which adverse transitory terms of trade shocks produce a decline in current income, which leads to a decline in savings and, thus, a deterioration in the current account balance. MFR also include a number of structural variables (eg openness, GDP per capita, concessional debt) which they find to be relevant for reversals of external imbalances in developing countries. We do not include these variables in our regressions both because in most cases they are less important for industrial countries and because of our limited number of observations.

The results, reported in Table 3, are broadly consistent with MFR's findings for developing countries.[12] In line with our graphical analysis, we find that neither domestic macroeconomic factors nor variables measuring the composition of capital flow have systematic predictive power for current account adjustments. The coefficient on the lagged current account/GDP ratio is not statistically significant, indicating that higher current account deficits per se do not make a reversal more likely. While the coefficients on the real effective exchange rate and domestic output growth are positive as expected, they are not statistically significant. Moreover, while a shift towards more volatile types of capital is associated with a higher probability of an adjustment in the following year, this effect is not statistically significant. The only coefficients that are statistically significant are those on contemporaneous world output growth and US interest rates. That is, the lower world output growth, and the higher world interest rates, the greater the likelihood of a reversal occurring.

As an alternative, we estimated an ordered Probit model where the dependent variable takes the value 2 in the case of a current account reversal, 1 for episodes of sharp deterioration of the external balance but without subsequent correction, and 0 for all other observations. The results in Table 4, show that including observations without sharp declines in the current account balance (with or without reversal) does not help explain the occurrence of adjustments of external imbalances.

These results suggest that it is problematic to draw inferences on the likelihood of an imminent adjustment of external imbalances based on developments in the domestic macroeconomy and changes in the composition of capital flows. Our results highlight instead the significant role of contemporaneous global factors, such as global growth or interest rates, which MFR's found to matter also for developing countries. The global developments may be the triggers for the resolution of the imbalances in the domestic economy, which may be manifest in the current account deficit.

As discussed earlier, one potential problem with our model is that the results might be sensitive to simultaneity bias, given the potential bi-directional causality between current account reversals and macroeconomic and financial variables. We attempt to address this problem by using three-year averages of the latter in the equation explaining the former.

The literature offers several alternative estimation methods that potentially are useful for our exercise. Edwards (2003) uses a treatment effects model, which jointly estimates the Probit explaining the probability of a current account adjustment and an "outcome equation" explaining the impact of the adjustment on macroeconomic factors and capital flows. Tudela (2004) estimates a duration model which explains the probability of countries experiencing a currency crisis in terms of the time spent without a crisis, as well as macroeconomic and financial variables. Calderon et al (2002) use a Generalised Method of Moments estimator to generate consistent estimators. We opted against following these alternatives because of the limited amount of episodes in our sample.

The impact of reversals on output and exchange rates

We next explore the impact that current account reversals have on output growth and the real effective exchange rate. We follow MFR and conduct a "before-after" analysis, where we regress output growth after the current account adjustment on its level prior to the reversal and a set of explanatory variables, all taken as three-year averages before the reversal.[13]

The dependent variable is expressed as the average output growth in the three years after the peak of the current account deficit.[14] The current account to GDP ratio is introduced on the right-hand side to capture the size of the necessary reversal. The ratio of non-residents' holdings of currency and deposits to GDP, lagged by one year, is also included to capture the influence of capital account dynamics.

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[12] Our main results still hold when we include the fiscal balance, investment, and the reserves to GDP ratio among the explanatory variables. The same is true when we estimate a simplified version of the model, where the independent variables comprise only the lagged averages of the current account/GDP ratio, real GDP growth and the real effective exchange rates.

[13] The main results do not change when we also include contemporaneous values of US interest rates and world GDP among the explanatory variables to control for the impact of exogenous external shocks.

[14] For episodes in which the current account balance does not improve, the averages are computed three to five years after the current account deficit started to deteriorate substantially.

We then run a similar regression to explore the behaviour of the exchange rate during adjustment episodes. We regressed the average change in the real effective exchange rate during the three years following a peak of the current account deficit on its own lag, the past current account to GDP ratio, past GDP growth, and the financial account variable lagged one period.

The equations are estimated over a cross-section sample of 50 events (28 current account reversals and 22 cases of substantial current account deterioration).

The regression results for output growth and the real effective exchange rate are shown in Tables 5 and 6, respectively. The results clearly suffer from the small number of observations in our sample.[15] In the equation explaining output growth, only the coefficient on US short-term rates is statistically significant. Conditioning on past output growth, the current account, the effective exchange rate and the change in the composition of the financial account fail to explain changes in output growth. While the negative result for past output growth is consistent with MFR's findings, we do not find a positive and statistically significant coefficient on the size of the current account deficit prior to the adjustment, as they do.

We reach similar conclusions for the estimation of the exchange rate equation. We do not find evidence that the size of the current account deficit or composition of capital flows affect exchange rate changes in a systematic way.

Our empirical results fail to detect a systematic pattern through which output growth and the exchange rate are affected during current account adjustments. This result appears to be driven by the heterogeneity across episodes and the limited number of observations in our sample.

4. Current account dynamics in the United States

While the above analysis of the 28 episodes of current account adjustments describes the average adjustment process that has occurred, two considerations suggest that it is worth examining the adjustment in the United States in the mid 1980s in more detail. First, the US dollar is the predominant international reserve currency. Residents of countries accumulating foreign exchange assets allocate a significant portion of their portfolio to dollar assets. Thus the wealth effects of changes in the exchange rate of the US dollar are spread around the world, and are not borne by the United States itself. In contrast, many other countries have a sizeable share of their liabilities denominated in foreign currency (often the US dollar).[16] In other countries, a depreciation will boost the domestic currency value of these liabilities and their servicing costs whereas it will not in the United States. Second, the United States has benefited from a persistent yield gap between the return earned on its international assets and those paid on its liabilities. This has contributed to the United States continuing to receive a positive net income despite its rising net foreign liabilities position (Graph 7), a situation which is not observed in other countries with current account deficits.

In 1983, the United States current account deficits began to increase, reaching 3.5% of US GDP by 1987 (Graph 8). The widening current account deficit was mainly driven by rapid growth in domestic demand boosted by, among other things, the increasing fiscal deficit and the marked rise of the dollar, which between 1980 and 1985 appreciated by more than 50% in nominal effective terms. The appreciation of the dollar was underpinned by current and prospective cyclical positions favouring the United States relative to Japan and Germany at the time. This led to expectations of a monetary tightening in the United States and stable or easing monetary policy in the other two countries. In addition, growing foreign investment in the United States also contributed.

The mechanism through which the US current account deficit was eliminated between 1987 and 1991 shared two noteworthy features with the reversal episodes in other countries described (Graph 1). First, the US deficit started to decline when it reached around 3–4% of GDP. Second, the US reversal

[15] MFR use between 65 and 84 observations.

[16] Note that many developed countries do have a significant share of their domestic liabilities denominated in their domestic currency. The US, however, has nearly *all* its liabilities in its own currency.

was accompanied by both a depreciation of the domestic currency and a slowdown of domestic growth.

However, some significant differences between that reversal and those in other countries are apparent. The main difference concerns the mix of the adjustment mechanism. In 1987, the main channel of adjustment was the exchange rate, which depreciated much more markedly than the currencies of most of the other countries in our sample experiencing current account reversals. Between 1985 and 1987, the dollar fell sharply in both nominal (35%) and real effective terms (27%). The main counterparts to the adjustment were the yen, which appreciated by 65% against the dollar, and the Deutsche mark, which gained almost 60%. The yen's sharp rise occurred against the background of very robust growth in Japan (Table 7). The German economy grew less strongly but still outpaced the US economy during the period 1988–90.

Three factors contributed to the magnitude of the dollar's correction. First, the extent of the dollar's rise in the first half of the 1980s was unusually large. Second, the dollar's adjustment was intensified by coordinated central bank intervention in early 1985, as well as the Plaza Agreement of September 1985, which indicated that some further orderly appreciation of the other major currencies against the dollar was desirable. The G5 authorities also stated that they would stand ready to cooperate more closely to encourage this (Galati and Melick (2002)). Third, the stock market crash in October 1987 and the subsequent easing of US monetary policy contributed to a reducing the attractiveness of US dollar investments.

Output growth played a less important role in the initial stages of the adjustment process than in the other countries. While US GDP growth slowed sharply in the course of 1985, it remained fairly steady over the next few years. This pattern stands in contrast to adjustments elsewhere, when the timing of the reversal typically coincided with a fall in domestic output. While the current account deficit narrowed further during the US recession of 1991, by then much of the reversal in the current account had already occurred.

Another important difference between the US current account reversal in 1987 and other episodes concerns the behaviour of the ratio of external liabilities to GDP. This ratio remained much smaller in the United States than in other countries throughout the adjustment episode. One explanation for this is that nearly all US foreign liabilities are denominated in US dollars, while US foreign assets are often denominated in foreign currencies. A depreciation of the US dollar therefore leaves the value of the liabilities unchanged but boosts the US dollar value of foreign assets. Hence the depreciation of the US dollar reduced the value of the net foreign liabilities of the United States.

The behaviour of private financial flows during the reversal of the US current account deficit in the mid-1980s was broadly consistent with the patterns observed in the adjustment episodes for other countries (Graph 9). The two categories of financial flows that changed more visibly around 1987 were holdings of foreign deposits (by both residents and non-residents) and non-residents' holdings of US debt. In addition, FDI by non-residents also contributed to the adjustment.

That said, there is one important difference between the United States and other industrial countries in terms of financial flows. Since the dollar is the main international reserve currency, dollar assets account for a substantial fraction of foreign exchange assets in other countries' portfolios. In contrast to all other countries that experienced current account adjustments, both during the reversal of the US external imbalance in 1987 and in the current situation, purchases of dollar assets (particularly bonds) by foreign public sector entities financed a sizeable share of the US deficit (Graph 8). In the mid-1980s, official dollar reserves increased noticeably as the US deficit widened. The reversal of the US external imbalance was accompanied by a reduction in official holdings of dollar assets. Such flows are not evident in current account episodes in other countries.

5. Conclusions

This paper has examined episodes of current account adjustment in developed countries over the past 30 years. Similar to the conclusions reached by Freund (2000) and Milesi-Ferretti and Razin (1998), the paper found that current account reversals were associated with a notable slowdown in domestic growth and a large exchange rate depreciation. However, whether the current account adjustment was exogenous or endogenous to these developments is not clear. A plausible explanation is that the

evolution of the current account deficit in such episodes purely reflects the development and unwinding of domestic economic imbalances.

To shed further light on the nature of the adjustment, the behaviour of capital flows during these adjustment episodes was also examined. There was no obvious change in the nature of capital flows in the period just prior to a current account reversal, with the possible exception of non-residents' holdings of currency and deposits. This suggests that the current account reversal may be more likely to be an endogenous event (responding to the resolution of domestic imbalances) rather than an exogenous event where the size of the current account deficit itself precipitates the adjustment in the domestic economy and the exchange rate. The econometric evidence suggests that global developments trigger the adjustment in the current account, possibly because they also trigger the unwinding of the domestic imbalances.

The evidence from the capital flows also shows that the bulk of the adjustment was in private sector flows, with the exception of the United States in 1987. The adjustment was also primarily on the part of foreign investors. In contrast to the experience in developing countries, there is little evidence of capital flight on the part of domestic residents.

The current account reversal in the United States in 1987 has some notable differences to that observed in the other episodes. The exchange rate played a larger than average role in the adjustment process. The role played by official flows was much more significant in the US adjustment than in other countries. Finally, the fact that the US dollar is the international reserve currency has differing implications in terms of the valuation effects on net foreign liabilities, and the consequent impact on servicing costs.

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Tables

Table 1

Financial flows and current account adjustments

	Percentage of episodes in which the financing flow changes in line with the current account adjustment
Non-residents' holding of domestic instruments	89
Loans by foreigners to residents	78
Non-resident holdings of domestic currency and deposits	58
Residents' holdings of foreign currency and deposits	70
Foreign direct investment in the country	36
Foreign direct investment abroad	35
Reserve assets	68

Note: A current account adjustment is defined by three conditions: (i) the current account should exceed 2% of GDP prior to the adjustment; (ii) the average deficit should decline by at least 2% of GDP over three years and be reduced by at least a third; (iii) the largest deficit during the five years after the peak should not be wider than the smallest deficit during the three years before the peak. The table covers 28 episodes of current account adjustments observed over the period 1974–2002, comprising: Australia (1989, 1999); Austria (1977, 1980); Belgium (1981); Canada (1981, 1993); Denmark (1986); Finland (1991); France (1982); Greece (1985); Ireland (1981); Italy (1974, 1981, 1992); New Zealand (1984); Norway (1977, 1986); Portugal (1981, 2000); Spain (1976, 1981, 1991); Sweden (1980, 1992); United Kingdom (1974,1989); United States (1987).

Sources: IMF, Balance of Payments Statistics; BIS estimates.

Table 2

Explaining the likelihood of sizeable deficits

Probit model, 1973-2003

Variable	Coefficient	Standard error
Current account balance	-0.4623	0.0486**
Real effective exchange rate	0.0232	0.0070**
GDP growth	0.1597	0.0473**
Composition of financial flows	-0.0200	0.0106*
US real interest rate	-0.0698	0.0260**
OECD growth	-0.1398	0.0513**
Total observations		527
Obs with dependent var = 0		344
Obs with dependent var = 1		183
% Correct with dep var = 0		89.0
% Correct with dep var = 1		75.4

Note: Dependent variable takes the value 1 if the current account deficit (as a % of GDP) is below 2%, and zero otherwise. The standard errors reported in the table are corrected using the Huber/White procedure for robust standard errors. ** (*) indicate statistical significance at 95% (90%) confidence level. The current account balance is defined as the average current account balance as a % of GDP over the three years preceding the event. The real effective exchange rate is expressed as cumulative change in the three years preceding the event. GDP growth is the average of real GDP growth over the three years preceding the events of the difference between the country growth rate and the rate of growth in the OECD countries. The composition of financial flows is the sum of non-residents' net inflows (comprising: currency and deposits, debt and loans (as a % of GDP), in the year preceding the event. The real interest rate of the United States is the prime lending rate deflated by GDP deflator. OECD growth is the annual rate of growth in the OECD countries.

Table 3

Explaining the likelihood of current account adjustments

Probit model, 1973-2003

Variable	Coefficient	Standard error
Current account balance	-0.117	0.100
Real effective exchange rate	0.003	0.023
GDP growth	0.038	0.174
Composition of financial flows	0.053	0.042
US real interest rate	0.141	0.080*
OECD growth	-0.484	0.201**
Total observations		38
Obs with dependent var = 0		17
Obs with dependent var = 1		21
% Correct with dep var = 0		52.9
% Correct with dep var = 1		71.4

Note: Dependent variable takes the value 1 if a current account reversal takes place, and zero if the current account balance declines by at least 2% of GDP over two years. The standard errors reported in the table are corrected using the Huber/White procedure for robust standard errors. ** (*) indicate statistical significance at 95% (90%) confidence level. For a definition of the explanatory variables, see Table 2.

Table 4

Explaining the likelihood of current account adjustments

Ordered Probit model, 1973-2003

Variable	Coefficient	Standard error
Current account balance	-0.072	0.021**
Real effective exchange rate	0.006	0.008
GDP growth	0.063	0.055
Terms of trade	-0.063	0.024**
Composition of financial flows	-0.021	0.011*
US real interest rate	0.098	0.055*
OECD growth	-0.044	0.067
Total observations		505
Obs with dependent var =0		505 (470)
Obs with dependent var =1		0 (18)
Obs with dependent var =2		0 (17)

Note: Dependent variable takes the value 1 if a current account reversal takes place, 2 if the current account balance declines by at least 2% of GDP over two years, and 0 otherwise. The standard errors reported in the table are corrected using the Huber/White procedure for robust standard errors. ** (*) indicate statistical significance at 95% (90%) confidence level. The last three rows indicate predicted observations, with actual observations in parentheses. For a definition of the explanatory variables, see Table 2. The terms of trade are taken at the time of the reversal.

Table 5

GDP growth and current account adjustments

OLS regression, cross-section

Variable	Coefficient	Standard error
Constant	3.102	0.787
GDP growth	-0.190	0.140
Current account balance	-0.043	0.071
Real effective exchange rate	-0.031	0.024
Composition of financial flows	-0.066	0.026
US real interest rate	-0.082	0.117**
Total observations		41
R2		0.16

Note: Dependent variable is the average of the growth rate in the three years following a peak of the current account deficit (which may or may not be followed by an adjustment). ** (*) indicate statistical significance at 95% (90%) confidence level. Real GDP growth, the current account balance and the real effective exchange rate are computed as average growth rate in the three years preceding the event. The US real interest rate is defined as in Table 2.

Table 6

Real exchange rate changes and current account adjustments

OLS regression, cross-section

Variable	Coefficient	Standard error
Constant	4.735	4.725
GDP growth differential	-0.685	1.259
Current account balance	0.504	0.372
Composition of financial flows	0.071	0.159
US real interest rate	-0.594	0.719
Total observations		38
R^2		0.1

Note: Dependent variable is the cumulative change in the real effective exchange rate in the three years preceding the current account trough (both v shaped reversals and not v shaped trough) . ** (*) indicate statistical significance at 95% (90%) confidence level. The GDP growth differential is the average growth rate in the three years preceding the event of the dependent variable.

Table 7

Real growth, exchange rate depreciation and the US trade balance

	Growth rate			Exchange rate[1]			US trade balance by country[2]	
	1985–87[3]	1988–90[3]	2003	1985–87	1988–90	Sep 2004[4]	1987	2003
China	12.2	6.4	9.3	–38.3	–22.1	0.0	1.8	25.0
Euro area	2.4	3.9	0.5	48.3	11.2	7.4	13.6	19.7
Germany	2.0	4.4	–0.1	58.1	11.3	7.4	10.1	7.9
Japan	4.0	5.7	2.7	64.5	0.1	7.8	37.1	13.3
Asia[5]	4.8	8.0	4.5	–4.2	2.0	1.9	15.1	9.7
Canada	3.8	2.6	1.7	–2.4	13.6	6.9	7.4	10.4
OPEC countries	…	…	…	…	…	…	8.5	10.3
Saudi Arabia	–1.1	5.5	7.2	–5.9	0.0	–0.1	0.7	2.7
United Kingdom	4.0	2.7	2.1	22.7	8.9	10.4	2.1	1.8
United States	3.5	3.2	3.1	.	.	.	.	.

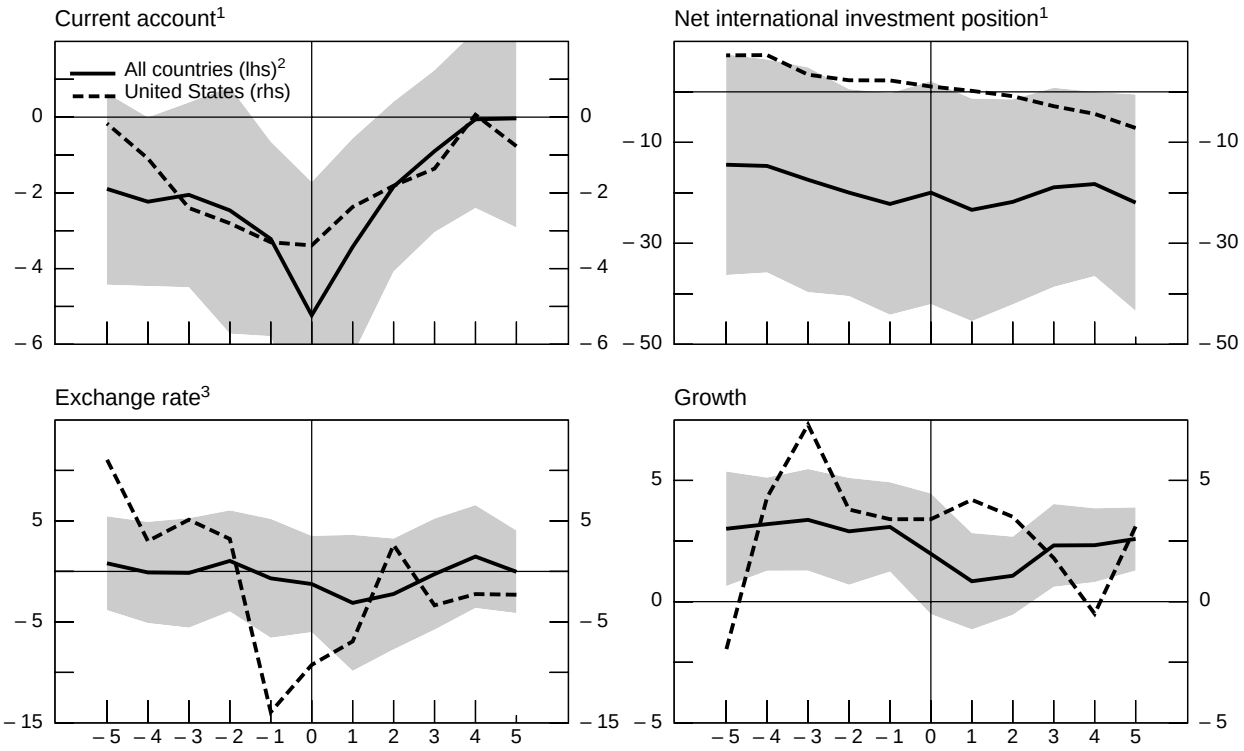
[1] Cumulative percentage changes; an increase indicates an appreciation against the dollar. [2] In percentages. [3] Annual growth rates, averages for the periods indicated. [4] Sept 2004 over January 2002. [5] Simple average for Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand.

Sources: IMF; OECD; national data.

Graphs

Graph 1

Current account adjustments and exchange rate dynamics



Note: A current account adjustment is defined by three conditions: (i) the current account should exceed 2% of GDP prior to the adjustment; (ii) the average deficit should decline by at least 2% of GDP over three years and be reduced by at least a third; (iii) the largest deficit during the five years after the peak should not be wider than the smallest deficit during the three years before the peak. The graph covers 28 episodes of current account adjustment, comprising; Australia (1989, 1999); Austria (1977, 1980); Belgium (1981); Canada (1981; 1993); Denmark (1986); Finland (1991); France (1982); Greece (1985); Ireland (1981); Spain (1976, 1981, 1991); Sweden (1980, 1992); United Kingdom (1974, 1989); United States (1987). Twenty-one episodes are drawn from Caroline L Freund (2000).

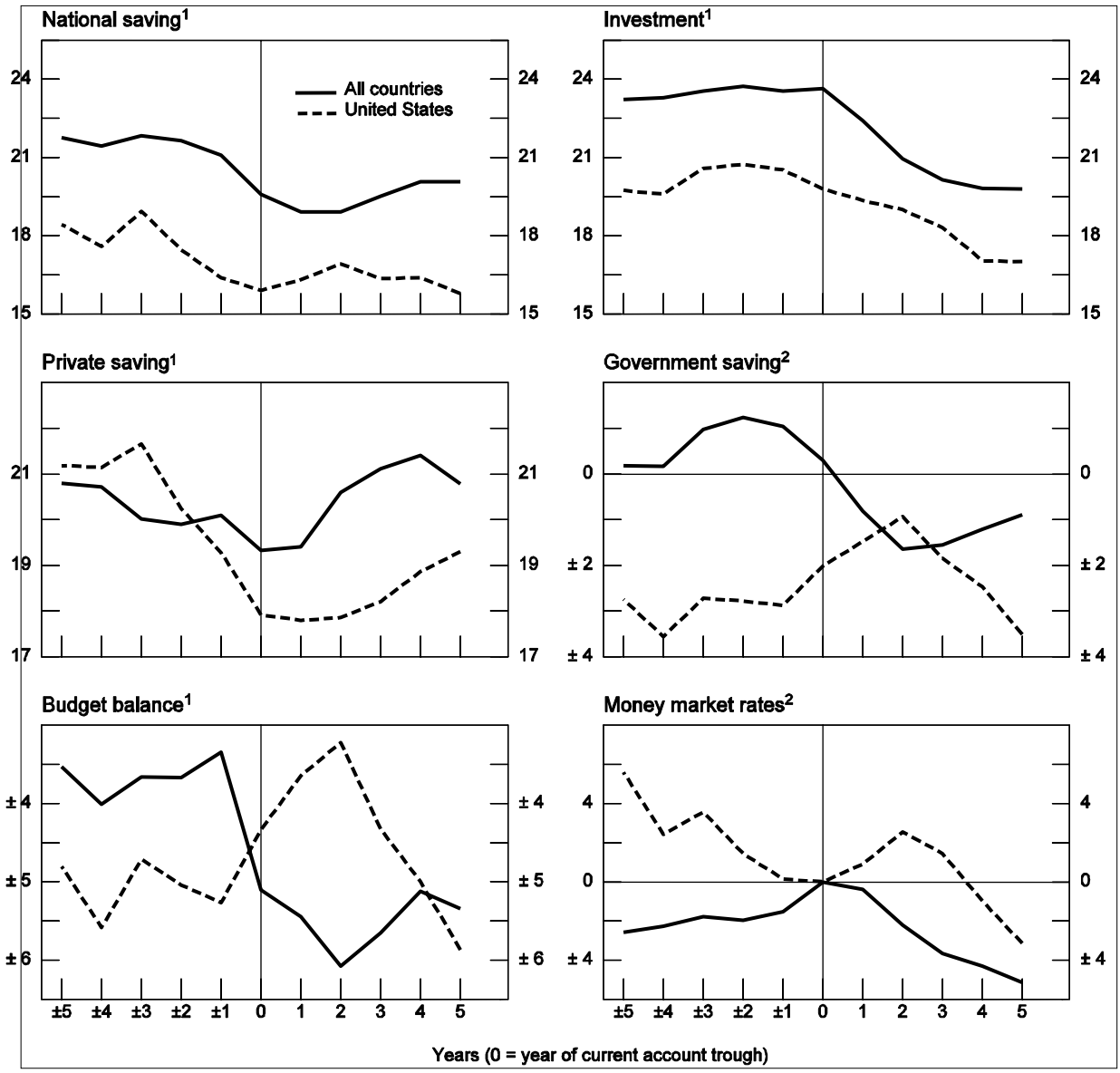
The shaded areas represent ±1 standard deviation around the averages for all countries.

[1] As a percentage of GDP. [2] Simple average of all episodes. [3] Annual percentage change in real effective exchange rates (in terms of relative consumer prices).

Sources: IMF; OECD; national data; BIS calculations.

Graph 2

Current account adjustments and national income accounts



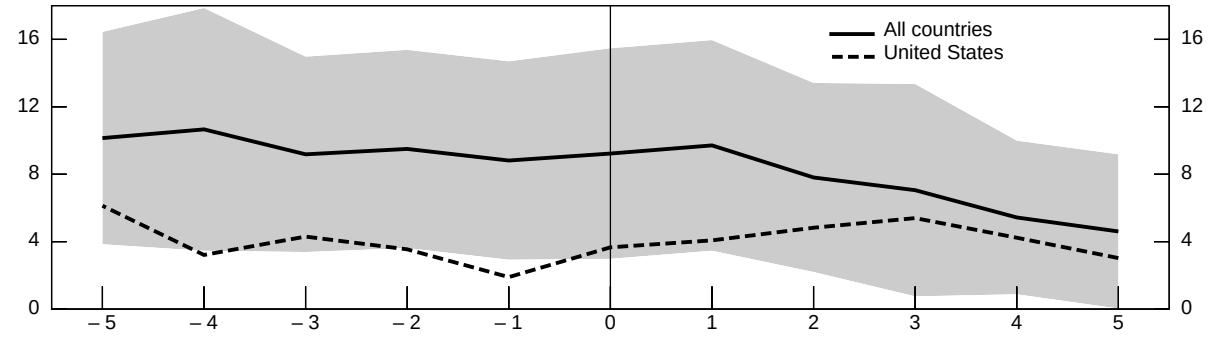
Note: For an explanation, see Graph 1.

[1] As a percentage of GDP. [2] Change from year of current account trough, in percentage points.

Sources: IMF; OECD; European Commission; national data; BIS calculations.

Graph 3

Current account adjustment and inflation[1]



Note: For an explanation, see Graph 1.

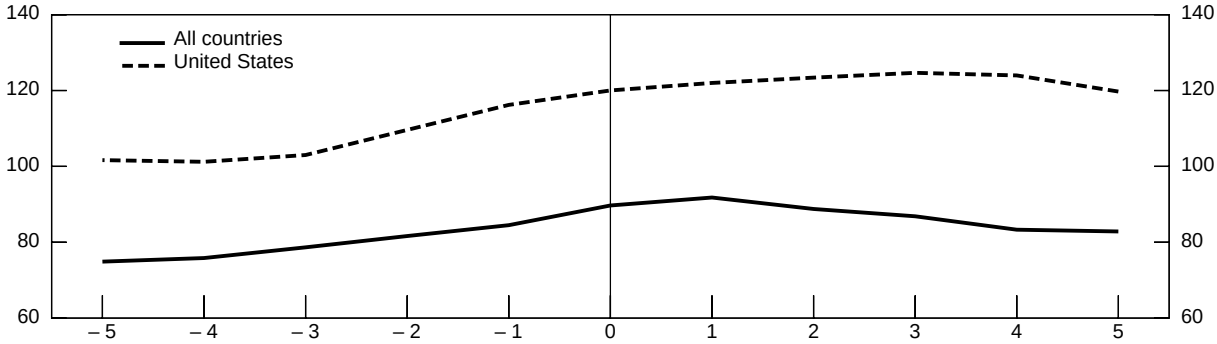
The shaded areas represent ±1 standard deviation around the averages for all countries.

[1] In per cent.

Sources: National data; BIS calculations.

Graph 4

Current account adjustment and credit growth[1]



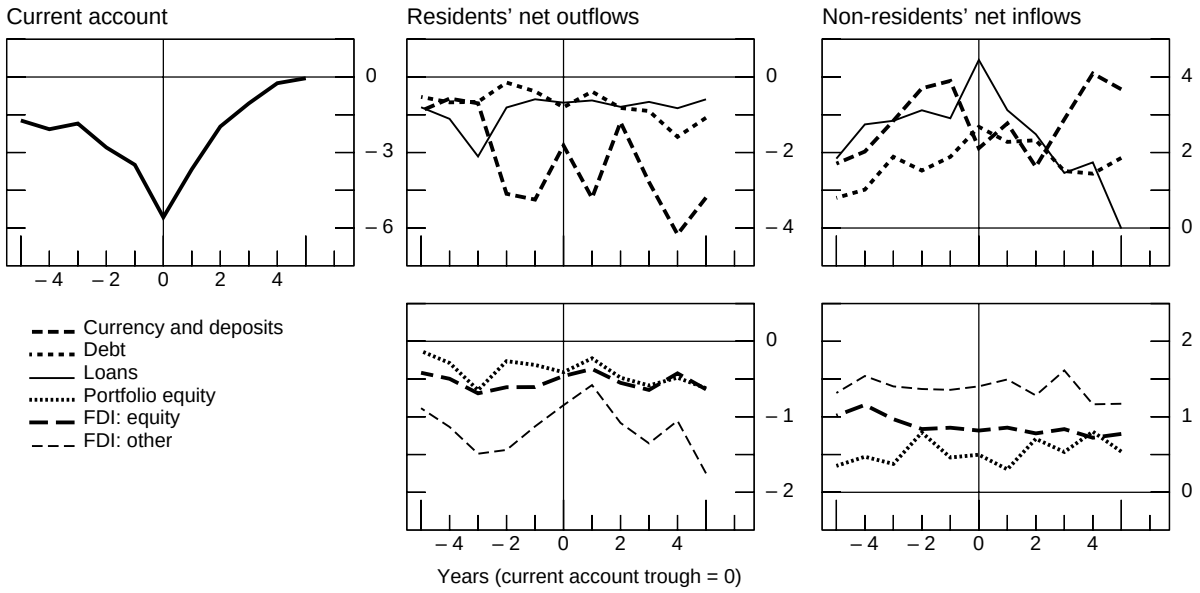
Note: For an explanation, see Graph 1.

[1] In per cent of GDP.

Sources: National data; BIS calculations.

Graph 5

Current account adjustments and financial flows[1]



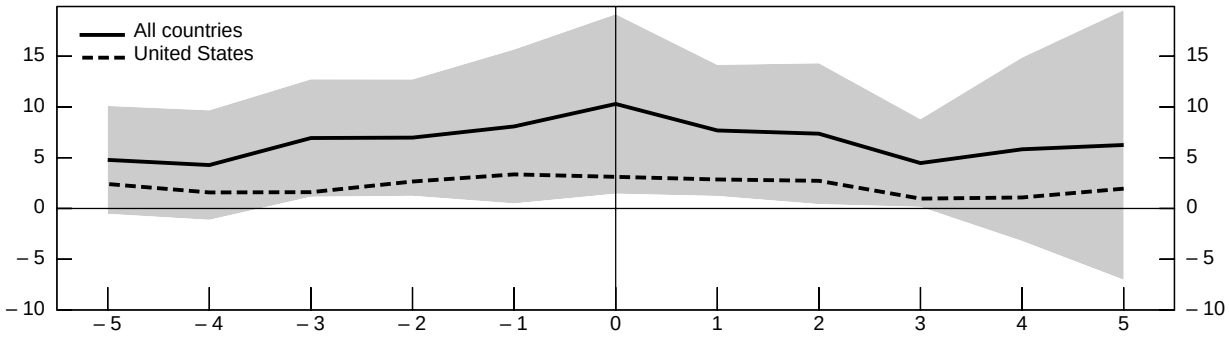
Note: For an explanation, see Graph 1.

[1] As a percentage of GDP.

Sources: IMF, *Balance of Payments Statistics*; BIS calculation.

Graph 6

Non-residents' net inflows[1]



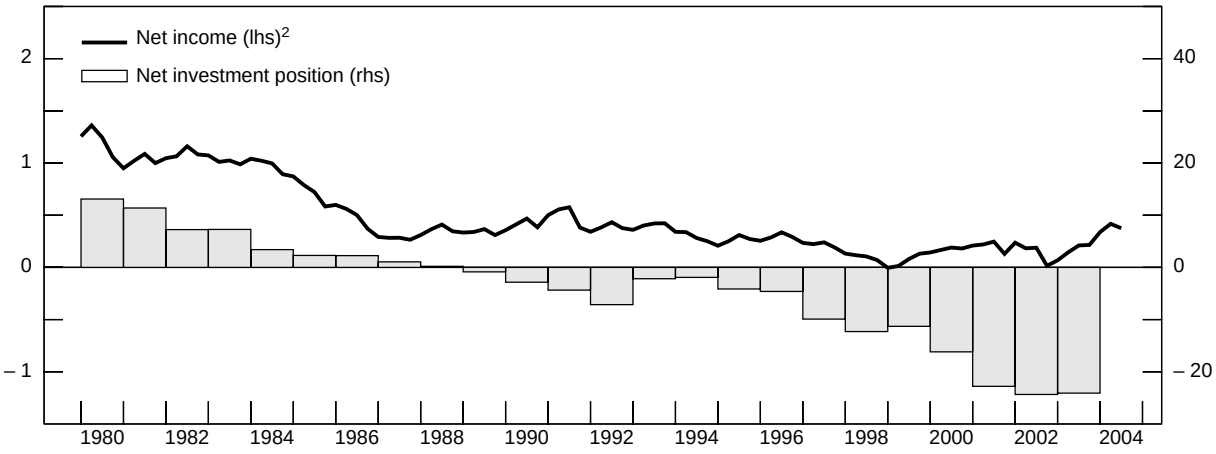
Note: For an explanation, see Graph 1.

[1] Sum of currency and deposits, debt and loans, as a percentage of GDP.

Sources: IMF, *Balance of Payments Statistics*; BIS calculations.

Graph 7

International investment position and income of the US[1]

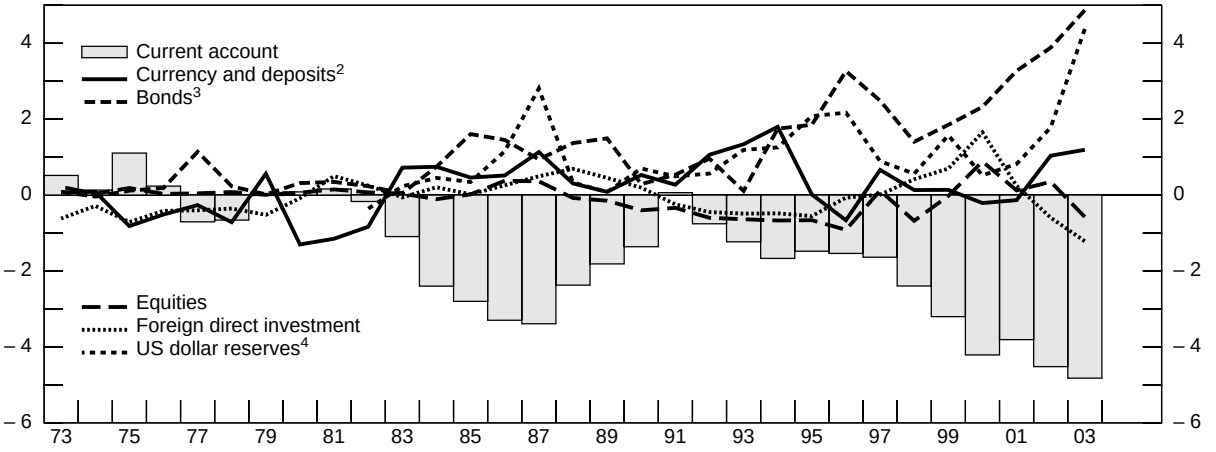


[1] As a percentage of GDP. [2] Three-quarter moving average.

Sources: IMF; National data.

Graph 8

The US current account deficit and its financing[1]

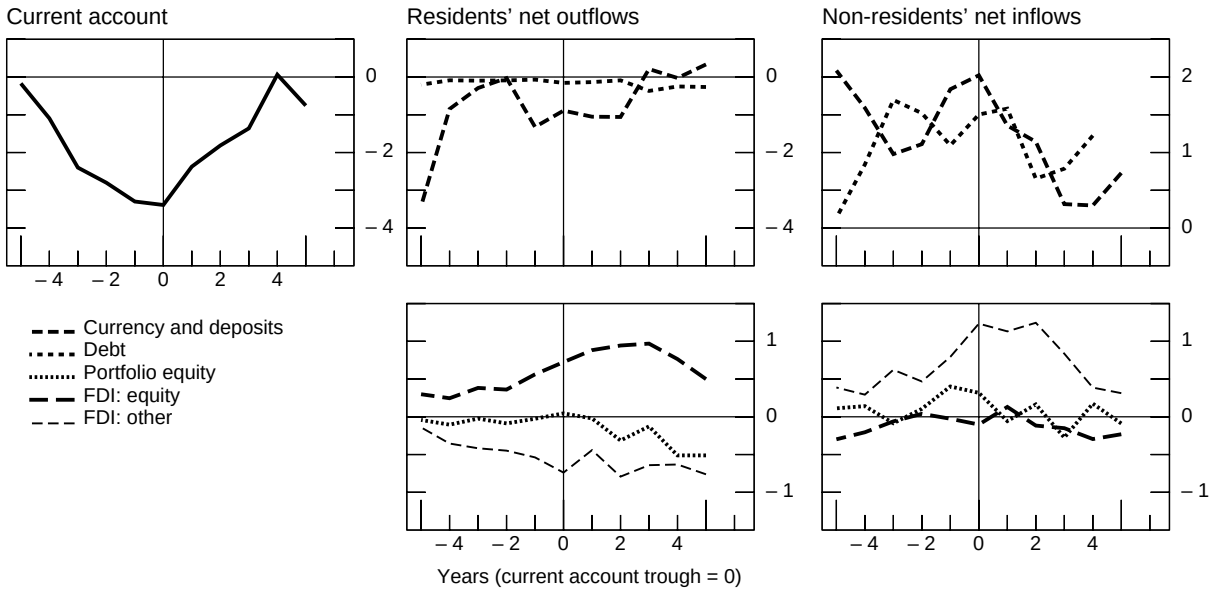


[1] As a percentage of GDP; financing variables are net flows. [2] Excluding interbank loans. [3] Including central bank holdings. [4] Changes in central bank holdings of US dollar assets.

Sources: IMF; National data; BIS.

Graph 9

US current account adjustment and financial flows



Source: National data.