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Current Account Deficits in Industrial Countries: The Bigger They Are, The Harder They Fall?*

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Current Account Deficits in Industrial Countries

Abstract: There are a number of worrisome features of the U.S. current account deficit. In particular, its size and persistence, the extent to which it is financing consumption as opposed to investment, and the reliance on debt inflows raise concerns about the likelihood of a sharp adjustment. We examine episodes of current account adjustment in industrial countries to assess the validity of these concerns. Our main findings are (i) larger deficits take longer to adjust and are associated with significantly slower income growth (relative to trend) during the current account recovery than smaller deficits, (ii) neither persistent deficits nor large net foreign debt positions are accommodated by more extensive exchange rate adjustment or slower growth, (iii) consumption-driven current account deficits involve significantly larger depreciations than deficits financing investment, and (iv) the composition of the financing of the deficit is orthogonal to exchange rate movements and income growth during adjustment. Our findings are consistent with earlier work showing that, in general, current account adjustment tends to be associated with slow income growth and a real depreciation. Overall, our results support claims that the size of the current account deficit and the extent to which it is financing consumption matter for adjustment.

I. Introduction

The U.S. current account deficit was a record $666 billion in 2004, accounting for 5.7 percent of GDP and fully two-thirds of global net foreign lending. Its size, as well as the unprecedented foreign flows into U.S. bonds associated with it, have raised concerns about how the adjustment to a more balanced current account will play out. One grim scenario begins with foreigners suddenly losing their appetite for U.S. assets, and in the process of unwinding their large U.S. positions, pushing up interest rates, depressing growth, and causing a large depreciation of the dollar. Worries about such a disorderly adjustment first surfaced in 2000, when the U.S. deficit-GDP ratio crossed the 4 percent mark.

Current thinking implies that adjustment will be more difficult if it is postponed. Obstfeld and Rogoff (2004) state that "[exchange rate] adjustment will be sharper the longer is the initial rope that global capital markets offer to the United States." Bergsten and Williamson (2004) write that "[n]o one doubts that adjustment will eventually happen. The sooner it starts, the less the chance that it will take a catastrophic form." In discussing the imbalance, Stephen Roach (2004) projects that "[t]he sooner the world comes to grips with this problem, the better the chances of a successful rebalancing." The crux of these arguments is put succinctly by Lawrence Summers (2004): "It is healthiest to make adjustments before, rather than after, there is great pressure to do so."

The arguments against postponing adjustment assume that a large deficit, a persistent deficit, and/or the resulting large net foreign debt position significantly increase the pressure for adjustment in industrial countries. But this is not necessarily true. Given that financial markets in industrial countries operate relatively efficiently, one

interpretation of a deteriorating current account position is that it reflects the investment opportunities in the home country as compared with the rest of the world—a position stated repeatedly by U.S. Treasury Secretary John Snow. According to this view, a growing deficit is a sign of economic strength, and thus does not make a bad outcome more likely.

We aim to inform the recent debate by examining the U.S. situation within the context of current account reversals that have occurred in a wide range of industrial countries. In all, we have at our disposal twenty-six current account reversals that occurred between 1980 and 2003. The twenty-six episodes vary in a number of ways and allow us to place the current U.S. situation in context; while the U.S. may be in what it considers uncharted waters (with respect to its own history), along many dimensions its current scenario is not atypical.

There are well known characteristics of current account reversals in industrial countries. In particular, current account reversals in tend to involve a currency depreciation and a decrease in GDP growth (Freund 2000).[1] But "typical" can conceal considerable deviations across episodes, as some reversals are more benign than others. The main goal of this paper is to examine the extent to which aspects of the buildup of the current account deficit are associated with more severe outcomes; we attempt to uncover the set of preconditions that is associated with more benign outcomes, and the set that is associated with greater pain. Specifically, we examine—in the context of twenty-six current account reversals—the extent to which variation in the size and persistence of the current account deficit, its nature (whether it is funding consumption or

[1] Several analyses have replicated and updated these results, including IMF (2002), Debelle and Galati (2005), and Croke et al. (2005).

something more productive such as investment), and the size and composition of financing matter for the adjustment process. When then characterize the adjustment process in using three main measures: the extent of exchange rate depreciation, the slowdown in GDP growth, and the improvement in the current account balance that accompany reversals.

We begin by updating the characterization of current account reversals. To do this, we append the Freund (2000) analysis with a study of the dynamics of various financial variables through the adjustment process and incorporate data through 2003. The characterization can be summarized as follows. We verify that the main results from Freund (2000) still hold: Countries tend to experience slow GDP growth and a real depreciation as the current account adjusts, and the adjustment appears to be spurred by real export growth, as well as declining investment and consumption. Current account adjustments are generally matched by reversals in the financial account. In emerging markets, all types of portfolio investment flows—debt, equity, and banking—adjust sharply (Faucette, Rothenberg, and Warnock; 2005), but in our sample of industrial countries the financial account dynamics are more subtle. The most dramatic adjustment is in the banking or "other" flows, which decrease over 2 percentage points (of GDP) in the first two years of the adjustment. In addition, bond inflows appear to surge in the run-up to the reversal. In contrast, equity and direct investment flows do not show well defined dynamics around the adjustment process.

Our results on the relationship between preconditions and outcomes can be summed up as follows. We find that larger deficits take longer to resolve and are associated with relatively slower income growth during recovery. There is no significant

correlation between size of the deficit and the extent of depreciation. In contrast, reversals that were preceded by a persistent deficit (a deficit that lasted for at least five years before reversing) are not associated with more depreciation or slower growth. We find that consumption driven deficits tend to lead to a greater real depreciation than investment driven episodes: A one percentage point shift from investment to consumption (or government spending) generates an addition 0.7 percentage points in average annual depreciation during adjustment. We find relatively little evidence that the nature of the financing—whether it is through bond flows or more directly into productive uses, such as equity or direct investment—impacts the severity of the adjustment. Deficits associated with greater bond inflows do appear to be followed by larger increases in interest rates—perhaps because the bond inflows kept interest rates abnormally low—and a sharper decrease in equity prices. Finally, the size of the external position does not appear to affect the outcome.

We also examine the 1987 U.S. adjustment episode to discern to what extent it reflected the typical case, and look at the key indicators for 2004 in order to gauge where the United States stands with respect to adjustment. We find that in the 1987 episode, the extent of depreciation was very close to predicted, though adjustment was somewhat slower with less of a decrease in growth. We use 2004 values of key variables to predict the pattern of U.S. adjustment were it to begin now. The analysis suggests that were the adjustment to start in 2005, the dollar would depreciate 25% from its peak but only 2¼% annually over the next three years (as much of the depreciation occurs before the current account actually reverses).

The paper proceeds as follows. Section II defines episodes of adjustment, examines empirical regularities of current account and financial account adjustment in industrial countries, and discusses persistent deficits. Section III examines whether case studies support the notion that bigger deficits (in terms of size, consumption, and debt flows) imply harder falls. Section IV discusses the United States in light of the predictions. Section V concludes.

II. Characterizations of episodes of adjustment and persistent deficits

In this section, we define and characterize current account reversals and persistent deficits.

Episodes of adjustment

We update previous results from Freund (2000) using data through 2003 and also incorporate financial variables.[2] We document current account adjustment from a large deficit to highlight patterns of adjustment. The criteria for a current account adjustment are:

i. The current account deficit-GDP ratio exceeded two percent before the reversal.

ii. The average deficit-GDP ratio was reduced by at least two percentage points over three years (from the minimum to the centered three year average).

[2] The literature on current account adjustment is large and growing. Some examples include Milesi-Ferretti and Razin (1998), which examines empirical regularities of current account adjustment in low and middle income countries and do not find growth effects; Chinn and Prasad (2003), which examines the determinants of the current account balance in a cross-section of countries and find some support for stage-of-development theories of current account determination for developing countries; and Edwards (2001), which analyzes current account deficits in a sample of 120 countries and finds evidence that current account reversals lead to lower per-capita GDP growth, and also some evidence that an increase in a current account deficit is associated with a higher probability of a currency crash.

iii. The maximum deficit-GDP ratio in the five years after the reversal was not larger than the minimum in the three years before the reversal.

iv. The current account deficit-GDP ratio was reduced by at least one third.

Using these criteria on data from high-income OECD countries from 1980-2003, we identify 26 episodes of adjustment, listed in Table 1. In our sample, there is considerable variation across episodes, as current account troughs occurred between 1980 (Austria and Sweden) and 1999 (Austria, again, and New Zealand); ranged from relatively small deficits (2.1 percent in France) to some that were quite large (Portugal's 16.1 percent deficit); and were associated with a wide variety in the size of net foreign asset positions (from those that were nearly balanced or even positive, to one that exceeded negative 70 percent of GDP).[3]

Figure 1 documents the pattern of adjustment across a range of variables, with event time 0 corresponding to the year the current account balance is most negative. Consistent with previous studies, countries tend to experience slow GDP growth (and increasing unemployment) and a real depreciation as the current account adjusts. In addition, real export growth, as well as declining investment and consumption, spurs adjustment. Adjustments are associated with worsening budget deficits and a pause in the accumulation of reserves, but little change in real long- or short-term interest rates.

We next examine financial account dynamics through the adjustment period. Absent large shifts in errors and omissions or sharp movements in the capital account (which, for most countries, is too small to adjust much), current account adjustments must be

[3] Net foreign asset positions and gross liabilities positions are from Lane and Milesi-Ferretti (2005). Throughout our paper, using published IIP data instead of the Lane Milesi-Ferretti dataset would produce similar results, but with fewer observations.

matched by reversals in the financial account, but for industrial countries we know little about which components of the financial account actually adjust. As net amounts can mask considerable differences in inflows and outflows, Figure 2 is designed to show, for each of the four main components of the financial account (direct investment, equity flows, bond flows, and banking or other flows), the adjustment process for net inflows (inflows minus outflows), gross outflows, and gross inflows.

In emerging markets, all types of portfolio investment inflows dry up around the time of the current account reversal (Faucette, Rothenberg, and Warnock; 2005). In sharp contrast, in our industrial country sample the bulk of the adjustment in the year immediately following the current account trough comes via a sharp decrease in banking (or "other") flows. In contrast, net direct investment, equity, and bond flows do not show clearly defined dynamics around the adjustment. Because "net-nets" can hide interesting dynamics in gross flows, we present gross flows in the second and third columns of Figure 2. The only new piece of information that we can glean from the gross flows is that bond inflows typically surge in the run-up to the reversal and peak one to two years into the adjustment process.

Persistent Deficits

In addition to reversals, we characterize persistent deficits because much of the concern over the current U.S. episode has focused on its extended duration. Persistence is also related to the net foreign asset position (NFA) (which we also consider below), since persistent deficits will tend to decrease the NFA position.[4] Still, we think it is

[4] Persistent deficits need not result in large negative NFA positions if valuation effects offset the current account deficits. In practice, this can be true for a given year, as exchange rate movements can lead to

useful to have a separate variable that focuses entirely on duration in order to characterize these episodes and also to examine whether reversals from persistent deficits are inherently different. In addition, net foreign asset position data are only available for 24 of the 26 episodes.

We define deficits as persistent if they satisfy the following three criteria:

i. The CA/GDP ratio was below 2 percent for five consecutive years.

ii. There was no reversal (as defined above for five years).

iii. The CA/GDP ratio was below 2/3 of its initial level in each of the five years.

The first criterion ensures that we are examining persistent deficits. The second ensures that the deficit is not undergoing a reversal; this criterion effectively eliminates V-shaped deficits. The third eliminates slow improvements and highly variable deficits. In all, the criteria leave us with two types of persistent deficits, those that are continuously worsening and those that are flat but deep.

We identify 14 episodes of persistent deficits (Table 2). Of these, 10 were eventually reversed via adjustment episodes.[5] Four—Australia, Greece, Portugal, and the U.S.—have ongoing persistent deficits that remain unresolved. The average duration of a persistent episode is nearly 8 years. Characteristics of persistent deficits are shown in Table 3. The first column shows values for persistent-episode countries during the episode, the second column is for the same group outside of the episode, and the final column is for all other industrial countries. By definition the current account position is on average worse. Key characteristics include lower than average savings rates, high net

large valuation adjustments. However, if there is mean reversion in exchange rates, the valuation changes may well net to zero in the medium- to long-run.

[5] That is, 10 of our 26 reversal episodes were preceded by persistent deficits.

foreign debt, and somewhat elevated short-term interest rates. They are also somewhat less open—though this measure is highly variable and does not account for country size.[6] In contrast, investment-to-GDP and income growth are nearly identical to overall averages in the OECD. This suggests that persistent deficits are structural, and that foreign investment is largely driven by opportunities that would remain unexploited in a world where capital was immobile.

III. Are Some Reversals More Equal Than Others?

In this section, we evaluate whether large deficits, deficits that persist for at least five years, and/or deficits in countries with large foreign debt tend to involve more severe reversals.[7] To do so, we examine correlations between various outcomes (income growth, the extent of depreciation, the completeness with which adjustment occurred, and movements in interest rates and equity prices) with various preconditions (the size of the current account trough; whether the reversal was preceded by a persistent deficit; the extent to which it was associated with surges in consumption, investment, or fiscal deficits; the extent of indebtedness to the rest of the world; and the nature of its financing). We use three measures of depreciation: the total real depreciation during the seven years of the episode, the existence of an exchange rate crisis in that period, and the average depreciation from year 0 to year 3. Exchange rate crises are identified using the

[6] Countries that have run persistent deficits are on average very similar in size to countries that have not (Real GDP in US$ is about 4 percent greater), however, the standard deviation of income is larger (about 70 percent greater).

[7] IMF (2002) examines large deficits, defined as 4 percent of GDP or more that persist for at least 3 years, in addition to the definition of reversals from Freund (2000). They also find that current account improvement increases as the size of the deficit increases, but less than one for one. Their focus is, however, on general characteristics of reversals, as opposed to differences between episodes with large and small deficits. The definition is different from that of general reversals so does not provide a direct comparison between episodes with large deficits and more moderate deficits.

Frankel and Rose (1996) definition, using monthly data on the local currency-SDR nominal exchange rate.[8] We use two measures of growth: average growth in the three years of recovery less average growth over the whole period and average growth in the three years of recovery less average growth in the three years before recovery. Asset price movements are captured by the change in short-term rates, long-term rates, and equity prices (all adjusted for inflation) from three years leading into the current account trough to the three years following. Finally, we characterize deficits by the extent to which they were resolved after three years. Specifically, the variable RESOLVE is defined as the percentage point improvement in the current account GDP ratio from year 0 to year 3. The definition of current account reversals implies that RESOLVE will be correlated with the size of the deficit: to qualify as a reversal, a significant improvement in the current account must occur. Still, this variable allows us to test whether other factors are correlated with adjustment, and also the extent to which the average deficit is improved. That is, a coefficient on CA/GDP at trough of –1 would imply that deficits are fully reversed after three years. A coefficient of -.5 would imply they are 50 percent reversed. Simple correlations and significance levels are presented in Table 4. A data appendix offers more details about the variables.

Large and persistent deficits

As noted in the introduction, current thinking suggests that large and persistent deficits will involve more pain. However, the correlations presented in Table 4 imply that the resolution of large and/or persistent deficits does not require a more extensive

[8] A currency crisis has taken place if the nominal exchange rate depreciated by at least 25 percent over the last year, and by at least 10 percent more than in the previous year.

depreciation nor are they more likely to be associated with an exchange rate crisis. If anything, the correlations indicate that large and persistent deficits tend to involve less depreciation than average. (We discuss this result in more detail below.) The resolution of large deficits is, however, associated with a growth slowdown that is deeper than average (Table 4 and Figure 3). Not surprisingly, they also involve a significantly greater adjustment in a 3-year period. There is no indication that deeper or more persistent deficits are associated with larger adjustments in interest rates or equity prices.

Consumption- vs. Investment- vs. Government-driven episodes

If current account deficits are associated with consumption booms or large fiscal deficits, rather than a surge in the more productive investment spending, the adjustment process might be more painful. Indeed, the correlations in Table 4 imply that deficits driven by consumption growth involve significantly more depreciation in years 0 to 3. Similarly, deterioration in the fiscal balance increases depreciation, though the coefficient is not significant at standard levels. Consumption driven deficits are also associated with an increase in relative GDP growth 3year/3year. However, further examination shows that this is due to lower growth during the period when the deficit is worsening, as opposed to higher growth in the recovery period; consistent with this, the correlation between consumption growth in the pre-period and GDP growth relative to the long-run average is insignificant. Deficits driven by investment growth are associated with significantly slower income growth during recovery and significantly less depreciation than other episodes. These are likely the episodes that are most cyclical. The relationship between investment and depreciation is very strong (Figure 4). Interest rates

and equity prices do not appear to be influenced by whether the current account deficit is associated with surges in consumption, investment, or budget deficits. Finally, we find no evidence that the growth in the fiscal balance affects GDP growth relative to long-run average.

Large Indebtedness to the Rest of the World

It can be argued that countries that rely heavily on foreign financing are more prone to quick reversals in foreign investment and that these quick reversals can induce considerable pain. For example, if foreigners hold a sizeable portion of domestic assets (either in net or gross terms), their retreat could spark a spike in interest rates, decreasing equity prices, low growth, and a sharp depreciation.

To see whether this is true in our sample, we look at two measures of the extent of indebtedness to the rest of the world. The first is the size of the net foreign asset position relative to GDP. Here we see no evidence that countries with large net debt positions (that is, negative NFA positions) have worse outcomes with respect to their exchange rates, income growth, interest rates, or equity prices. Counter to the evidence on exchange rate depreciation, there does appear to be a higher incidence of currency crises in countries with more negative net foreign asset positions. The correlation with RESOLVE is negative, indicating that more negative NFA positions are (weakly) associated with greater improvements in the current account balance, however, the effect of the current account trough on adjustment is turns out to be the only robustly significant factor. The second measure we utilize is the size of the country's gross liabilities to the

rest of the world (scaled by GDP). Here the evidence is clear: Larger gross liabilities positions do not appear to be associated with significantly worse outcomes.

While we do not find evidence that a more negative NFA or gross liabilities position results in worse outcomes, simple correlations can be misleading if they are affected by outliers. In Figure 5 we present scatter plots of the relationships between gross liabilities positions and GDP growth and currency movements. The figures show that, with or without outliers, there is no apparent relationship between the extent of foreign indebtedness at the time of the current account trough and subsequent changes in GDP or currency values. If anything, larger gross liabilities positions are associated with less exchange rate depreciation.

Financing through Productive Means?

If the financial system does not intermediate very well, one could be concerned that large current account deficits financed by bond inflows are associated with borrowing binges that in the end bring more pain. In contrast, deficits financed by more productive inflows such as direct investment or equity inflows, because they went directly into productive uses, may well adjust in a more benign fashion. However, if the financial system is adept at intermediating, the form of the inflow should not matter; the system will find the best use for the funds, whether they enter the country as direct investment or short-term bond flows.

The evidence we present suggests the latter case. We find no evidence that the type of financing impacts the outcome for GDP growth or exchange rates.[9] Deficits

[9] Perhaps paradoxically, we find that greater productive inflows are associated with an increased incidence of crisis.

associated with larger bond inflows are associated with larger subsequent increases in short-term interest rates and a greater decrease in equity prices. This is consistent with the empirical evidence in Sack, Warnock, and Warnock (2005), who show that the cessation of large bond inflows can lead to a substantial increase in interest rates (which, presumably, could also lead to a sharper decrease in equity prices).

Regression Analysis

To explore these correlations in a bit more detail and evaluate economic significance, we regress GDP growth, depreciation, and the extent to which the current account deficit is resolved in three years on the current account trough, whether it was preceded by a persistent deficit, the composition of spending variables, and (where relevant) the net foreign asset position. Table 5 reports the results when relative income growth relative to the long run average is the dependent variable.[10] The coefficient on the size of the current account deficit at its trough is 0.15 and statistically significant. This implies that a one percentage point increase in the current account deficit at its trough is associated with a 0.15 percentage point slowdown in annual growth during the first three years of recovery. Persistent deficits do not, however, have significantly different growth effects. A large negative NFA position also does not impact growth, nor do investment, consumption, and fiscal growth in the pre-recovery period.

While larger deficits are correlated with slower subsequent growth, this does not necessarily imply that larger deficits depress growth. The greater deficit may be a result of a more amplified business cycle: strong growth drives the deficit up, and the

[10] We use GDP growth relative to long run average because the GDP growth in the period before adjustment—the denominator of GDP growth 3year/3year—is correlated with the initial period variables, creating a bias.

slowdown that ensues as the deficit narrows is also more severe. To investigate differential business cycle effects, we examine whether greater growth before the deficit reversed tends to generate larger deficits. In particular, we examine the correlation between average income growth as the deficit widened and the size of the deficit. We measure income growth before the reversal analogously to income growth after the reversal, as three-year average GDP growth *before* the adjustment relative to long run GDP growth. The correlation between pre-reversal income growth and CA/GDP at trough is close to zero and insignificant. Thus, stronger growth as the deficit worsened is not correlated with the size of the deficit, but weaker growth as the deficit improved is correlated with the its size. We also find that the size of the deficit at its trough is uncorrelated with movements in unemployment.

Finally, if business cycle effects were the main driver of the episode, the correlation between GDP growth (3 year/3year) should be highly correlated with the extent of adjustment, with deficits that show a larger resolution, experiencing a greater slowdown relative to the previous three years, and therefore a more extreme business cycle. However, the correlation between these variables is near zero and insignificant. In contrast, GDP growth relative to long term GDP growth is correlated with the extent of adjustment (Figure 3). Thus, while the business cycle clearly plays a role in these adjustments, it does not fully explain why larger deficits are associated with slower real income growth.

The interest rate channel also appears to be absent: bigger deficits are not associated with bigger increases in interest rates, or with interest rates that are high relative to long run averages. Still, we find that larger deficits are associated with

significantly lower investment during the current account recovery. To examine whether this is a cyclical effect, we regress investment growth from year 0 to 3 on lagged investment growth (year –3 to 0) and the current account trough to see if this is simply strong investment growth that reverses (last column, Table 5). However, pre-reversal investment growth is insignificant, while the current account trough remains highly significant, with a coefficient of 0.5. Thus, we cannot rule out a depressing effect of the current account deficit on investment growth.

Table 6 reports results when average depreciation (from year 0 to year 3) and total depreciation are the dependent variables. For average depreciation, when all variables are included in the regression, we find that there are robust effects from being preceded by a persistent episode and from the extent of investment growth before reversal. In particular, the presence of a persistent deficit and greater investment reduce the extent of depreciation that is required to accommodate adjustment. As shown in Figure 4, the correlation between investment growth in the pre-period and exchange rate movements is very strong.

When total depreciation is the dependent variable, only the pre-period investment is significant and robust. This suggests that being preceded by a persistent deficit does not affect total depreciation, but does affect depreciation in the recovery period. In the persistent episodes, depreciation begins somewhat earlier, indicating stronger j-curve effects.

Investment growth in the period when the current account is worsening also reduces the extent of depreciation. In both specifications, we can reject that the coefficients on consumption growth and fiscal deterioration are equal to the coefficient

on investment growth. This implies that deficits driven by consumption or fiscal deterioration are associated with significantly more depreciation than those driven by investment. In particular, a one percentage point increase in investment growth is associated with an average depreciation that is 0.7 percentage points smaller and a total depreciation that is about 2.5 percentage points smaller. We cannot reject that consumption and fiscal deterioration have the same effect on depreciation. If we regress total depreciation on a constant alone the coefficient is –16.3 (not reported), implying that on average a total real depreciation of about 16 percent is required for adjustment.

Table 7 reports results on adjustment effects. We find that for each one percentage point increase in the current account trough, three years into recovery, the current account is about ½ a percentage point larger. The coefficient on CA/GDP at trough is significantly different from negative one, indicating that larger deficits remain significantly larger after 3 years. Thus, bigger deficits are not as completely resolved as smaller ones after three years. Only the size of the deficit matters for the extent to which it is resolved after three years.

Summary of Results

The results show that larger deficits are associated with slower income growth during the current account recovery period and take somewhat longer to resolve. Growth effects are more severe because more adjustment is required when the current account deficit is greater. Indeed, as we have shown, growth (relative to long run) is negatively correlated with the extent of adjustment (Figure 3). Although deeper deficits are associated with slower growth, they do not appear to require more depreciation. Once we

control for other variables, exchange rate movements are not significantly different in countries with deeper deficits. In part, this may be because nominal exchange rate adjustment is limited in some industrial countries, either because of managed systems, fixed exchange rates, or because key trading partners fix exchange rates. Restricted exchange rate adjustment in turn leads to more extreme current account deficits and lower income growth during current account recovery. Income growth is forced to accommodate adjustment precisely because depreciation is not more severe. Indeed, there is a strong inverse correlation between the extent of exchange rate adjustment and the slowdown in GDP growth (Figure 4). There is a tradeoff: adjustment comes through either exchange movements or GDP growth. If exchange rates movements are limited, the current account position worsens further and the GDP hit is more extreme.

We also found that the resolution of persistent deficits and of deficits with large negative NFA positions is broadly similar to others, in terms of total depreciation and growth effects. Investment-driven current accounts require less depreciation than episodes driven by consumption or government spending. This implies that investment channels resources into exports which can eventually service the debt. Finally, we found that financing does not matter significantly for the adjustment process, suggesting that markets are efficient at intermediating funds.

IV. Implications for the United States

In 1987 the U.S. deficit was driven largely by consumption—from 1984 to 1987 consumption grew 2½ percentage points while investment declined by 2 percentage points. Table 8 reports predictions, based on the significant variables in the regressions

above, and actual effects. It also reports predictions that are based on the assumption that the U.S. current account deficit begins its reversal this year; that is, predictions that use 2004 values of the initial conditions for the U.S. For the 1987 episode, the model performs reasonably well on depreciation—total depreciation was somewhat higher than predicted and average depreciation during the recovery was right on target. The model predicted slower growth and a larger adjustment than actually occurred. Despite the large current account deficit, the model predicts roughly the same total depreciation now and less depreciation from year 0 to year 3. The reason is that investment growth has been somewhat stronger and it is a persistent deficit, and persistent deficits tend to involve less depreciation during recovery.

Figures 3, 4 and 5 also show the predicted values for the United States—again, under the assumption that the reversal begins this year—with an open circle labeled US04. From those simple bilateral relationships, which do not take into account other factors, we see that were the U.S. current account deficit to begin a reversal this year, we would expect the following: a slowdown in GDP growth (Figure 3a or 5c) and a real exchange rate depreciation of about 4% going forward (Fig. 4a) and 17% from its peak (Fig. 5a and 5b). Of course, most of these bilateral relationships are not at all tight, so wide (sometimes very wide) confidence intervals—most of which would encompass zero—must be place around these point estimates.

Finally, a striking feature of Figures 3, 4 and 5 is that the U.S. is in no way an exception when placed with other current account reversal episodes. That is, the U.S. is typically found in the middle of the scatter plot and is never an outlier. There is, however, one aspect in which the U.S. is an outlier. Figure 6 shows that U.S. gross liabilities

scaled by Rest of the World GDP—essentially, what portion of rest of the world wealth ends up in the U.S.—are far larger than any other country's gross liabilities. There are two things to note about this figure. First, the fitted line is meaningless because the confidence band on the point estimate would be enormous and the fitted line would be downward sloping if we excluded the U.S.. Second, while the U.S. might look like an outlier on this graph, and perhaps to an economist, portfolio theory would suggest that the U.S. should have an even greater gross liabilities position. To put that another way, if we live in a world of severe home bias, do we think that a 37% gross liabilities position is "too large" for U.S.?

V. Conclusion

We have shown that large deficits are associated with a significant slowdown in income growth, though if anything they involve less depreciation. We think these facts are related. In countries where exchange movements are limited, either because of managed systems, fixed exchange rates, or key partners fix exchange rates, the current account will deteriorate more than if the exchange rate were flexible. Moreover, because of restricted exchange adjustment, growth will be forced to do much of the work of adjustment. Indeed, there is a very robust inverse correlation between income growth and the total exchange rate adjustment during the recovery.

In contrast, persistent deficits do not lead to a more severe adjustment. Our results suggest that they may be slightly less disruptive in terms of exchange rate movement, with depreciation beginning earlier in the episode and being somewhat more limited.

We also find that deficits driven by investment growth are more benign in terms of exchange rate adjustment than deficits driven by consumption or fiscal spending. This is intuitive, since these are the economies where the accrued debt can be more easily serviced.

On the financing side, we find that the nature of the inflows while the current account deficit is worsening does not impact the outcome. That is, whether the financing of the deficit comes through inflows of equity, direct investment, bonds, or bank deposits has no apparent bearing on the adjustment process, possibly because financial systems in industrial countries intermediate these flows rather well. Finally, the size of the foreign liabilities position seems to be uncorrelated with the adjustment process.

While looking at previous episodes offers some useful insights into how a U.S. adjustment might occur, there are several reasons to believe the United States is a special case. The main one is the size of the United States, and thus the large capital inflows necessary to finance the deficit. In addition, currency management by trade partners, who would suffer from a sharp U.S. adjustment, has limited exchange rate movements. The status of the dollar as the reserve currency also has important implications for adjustment. Finally, the fact that debt is denominated in U.S. dollars makes a depreciation less costly to domestic residents.

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Table 1: Episodes of Adjustment

Country	Trough Year	Current Account /GDP	NFA/GDP
Australia	1989	-5.9	-43.9
Austria	1980	-4.9	-12.8
Austria	1999	-3.2	-19.5
Belgium	1981	-4.1	-1.9
Canada	1981	-4.2	-36.5
Canada	1993	-3.9	-36.4
Denmark	1986	-5.3	-46.7
Finland	1991	-5.5	-34.3
France	1982	-2.1	-0.5
Greece	1985	-8.0	.
Greece	1990	-4.2	.
Iceland	1982	-8.2	-46.3
Iceland	1991	-4.0	-49.6
Ireland	1981	-13.1	-60.0
Italy	1981	-2.6	-3.6
Italy	1992	-2.4	-11.0
New Zealand	1984	-13.3	-53.4
New Zealand	1999	-6.2	-71.7
Norway	1986	-6.0	-13.6
Portugal	1981	-16.1	-41.8
Spain	1981	-2.8	-12.0
Spain	1991	-3.6	-16.1
Sweden	1980	-3.3	-7.4
Sweden	1992	-3.4	-21.1
UK	1989	-5.1	9.1
United States	1987	-3.4	-1.6
Average		-5.6	-26.4

Current account and NFA are at the time of the current account trough.

Table 2: Episodes of Persistent Deficits

Country	Year began	Length of Episode	Average Deficit	Average NFA
Australia	1980	10	-4.4	-32.0
Australia	1991 [a]	13	-4.2	-54.0
Austria	1976	5	-3.8	-12.8
Austria	1995	6	-2.5	-18.1
Canada	1974	8	-3.7	-34.6
Canada	1986	8	-3.6	-34.2
Denmark	1981	10	-3.7	-39.8
Greece	1976[b]	10	-4.5	.
Greece	1995 [a]	8	-5.7	.
Ireland	1976	6	-8.5	-52.7
New Zealand	1978	7	-5.6	-39.4
New Zealand	1994	7	-5.3	-68.2
Portugal	1996 [a]	7	-7.5	-34.4
United States	1998 [a]	6	-3.9	-19.3
Average		7.92[c]	-4.8	-36.6

a. Episode may not have ended as of 2003.
b. Current account data begins in 1976, so episode may have actually been longer.
c. Includes all episodes. If ongoing episodes are excluded, average is 7.7 indicating that recent episodes are somewhat longer.

Table 3: Characteristics of Persistent Deficit Episodes (Unweighted Averages)

Variable	Persistent deficit countries, in episode	Persistent deficit countries, out of episode	Other industrial countries
CA/GDP	-4.7	-1.5	1.0
GDP growth	2.9	3.2	2.8
Savings/GDP	20.8	22.4	25.2
Investment/GDP	23.7	23.1	23.7
Real Short Rate	3.4	2.2	2.1
Real Long Rate	3.5	3.1	3.5
Net Foreign Asset	-0.4	-0.2	0.0
Fiscal balance/GDP	-3.6	-3.8	-3.0
Openness	55.9	60.7	73.2

Averages for all persistent episodes, including unresolved episodes. All others includes other countries and same currents during periods that do not qualify as persistent.

Table 4: Correlation Coefficients

	CA/GDP at trough	Preceded by persistent deficit	Con/ GDP growth -3 to 0	Inv/ GDP Growth -3 to 0	Fis/ GDP Growth -3 to 0	NFA/ GDP at trough	Gross Liab /GDP at trough	Share of Bond Inflows	Share of DI/Equity Inflows
GDP Growth 3yr/3yr	**0.38** **(0.06)**	0.11 (0.60)	**0.38** **(0.05)**	**-0.84** **(0.00)**	-0.31 (0.12)	-0.07 (0.76)	-0.09 (0.67)	0.20 (0.34)	-0.19 (0.41)
GDP Growth (3yr/lr avg)	**0.51** **(0.01)**	0.16 (0.44)	0.05 (0.79)	**-0.37** **(0.07)**	-0.07 (0.72)	0.14 (0.53)	-0.07 (0.74)	-0.03 (0.89)	0.01 (0.97)
Total Dep	-0.33 (0.10)	0.29 (0.15)	**-0.43** **(0.03)**	**0.73** **(0.00)**	0.32 (0.11)	-0.12 (0.59)	**0.35** **(0.09)**	-0.07 (0.75)	0.02 (0.92)
Average Dep	**-0.39** **(0.05)**	**0.45** **(0.02)**	**-0.49** **(0.01)**	**0.74** **(0.00)**	0.32 (0.11)	-0.29 (0.17)	0.27 (0.20)	-0.21 (0.33)	0.31 (0.17)
Crisis	-0.28 (0.17)	-0.10 (0.64)	-0.01 (0.94)	-0.14 (0.51)	-0.05 (0.81)	**-0.43** **(0.03)**	-0.21 (0.34)	-0.16 (0.45)	**0.43** **(0.06)**
Resolve	**-0.75** **(0.00)**	0.02 (0.93)	0.10 (0.62)	0.12 (0.54)	0.00 (0.98)	**-0.36** **(0.08)**	0.02 (0.93)	0.02 (0.91)	-0.07 (0.78)
Short Rates	0.00 (0.99)	0.09 (0.70)	-0.21 (0.35)	0.07 (0.77)	0.26 (0.25)	-0.10 (0.68)	0.28 (0.21)	**0.38** **(0.09)**	0.06 (0.81)
Long Rates	-0.08 (0.74)	0.12 (0.60)	-0.32 (0.17)	0.13 (0.58)	0.09 (0.72)	-0.06 (0.81)	0.17 (0.46)	0.15 (0.53)	0.02 (0.93)
Equity Prices	-0.09 (0.70)	-0.25 (0.27)	-0.10 (0.68)	0.22 (0.35)	0.01 (0.96)	0.17 (0.49)	-0.11 (0.66)	**-0.58** **(0.01)**	-0.05 (0.84)

Notes: At most 26 observations. P-values in parentheses, with significance at the 10 percent level or better in bold. Year 0 is the year of the current account trough. Interest rates and equity prices are adjusted for inflation. In the outcome variables (in the first column), changes are generally expressed as the difference between the 3-year average following the trough and the 3-year average leading up to the trough. Exceptions are GDP Growth (lr avg), which is relative to the long-run average GDP growth, and Average Dep, which is average annual exchange rate movement from the trough to year 3. Total Dep is the maximum total depreciation from year –3 to year 3. In both cases, depreciation is negative. Crisis is the presence of an exchange rate crisis at some point between year –3 and 3. Resolve is computed as the percent point improvement in the exchange rate from year 0 to year 3. NFA, Gross Liabilities, and the Shares of Bond and DI/Equity Flows are defined in the Data Appendix.

Table 5: Growth Effects

Dependent Variable: GDP Growth 0 to 3 relative to long-run average								*INV/GDP growth 0 to 3*
CA/GDP at trough	0.15						0.16	0.51
	(4.00)						(2.81)	(3.77)
Preceded by persistent deficit		0.33					0.81	
		(0.75)					(1.41)	
CON/GDP growth (-3 to 0)			0.02				0.01	
			(0.30)				(0.09)	
INV/GDP growth (-3 to 0)				-0.12			-0.05	-0.22
				(1.74)			(-0.64)	(-1.63)
FISBAL/GDP Growth (-3 to 0)					-0.02		-0.03	
					(-0.50)		(-0.71)	
NFA at trough						0.01		
						(0.48)		
Constant	-0.30	-1.25	-1.16	-1.07	-1.15	-0.95	-0.57	-1.10
	(-1.13)	(-5.16)	(-6.59)	(-5.01)	(-5.74)	(-2.77)	(-1.28)	(-1.70)
R-squared	0.26	0.02	0.00	0.13	0.01	0.02	0.40	0.61
NOB	26	26	26	26	26	24	26	26

Robust T-statistics in parentheses.

Table 6a: Depreciation Effects

Dependent Variable: Average Annual Real Depreciation, Year 0 to 3							
CA/GDP at trough	-0.33 (-2.67)						0.05 (0.59)
Preceded by persistent deficit		2.81 (2.63)					3.28 (3.76)
CON/GDP growth (-3 to 0)			-0.53 (2.86)				0.16 (0.83)
INV/GDP growth (-3 to 0)				0.71 (7.49)			0.85 (5.99)
FIS BAL/GDP Growth (-3 to 0)					0.22 (1.22)		-0.17 (-1.97)
NFA at trough						-0.04 (-1.56)	
Constant	1.66 (2.24)	-2.82 (-3.75)	-.93 (-1.76)	-2.09 (-5.11)	1.52 (-2.89)	-3.01 (-3.20)	-3.54 (-4.10)
F-test Predcon=predinv							16.38 [0.00]
F-test -Predfis=predinv							21.38 [0.00]
F-test -Predfis=Predcon							0.00 [0.96]
R-square	0.56	0.21	0.24	0.55	0.10	0.08	0.73
NOB	26	26	26	26	26	24	26

Robust T-statistics in parentheses. P-values in brackets.

Table 6b: Total Depreciation

Dependent variable: Total Real Depreciation							
CA/GDP at trough	-1.05 (-3.28)						0.18 (0.41)
Preceded by persistent deficit		6.67 (1.51)					7.37 (1.42)
CON/GDP growth (-3 to 0)			-1.70 (-2.43)				0.57 (0.71)
INV/GDP growth (-3 to 0)				2.58 (5.69)			3.01 (4.61)
FIS BAL/GDP Growth (-3 to 0)					0.82 (1.20)		-0.35 (-0.82)
NFA at trough						-0.06 (-0.48)	
Constant	-22.17 (6.71)	-18.89 (-6.66)	-13.71 (-6.81)	-17.60 (-10.77)	-15.51 (-7.68)	-18.40 (-4.54)	-20.88 (-5.30)
F-test Predcon=predinv							8.17 [0.01]
F-test -Predfis=predinv							15.97 [0.00]
F-test - Predfis=predcon							0.05 [0.82]
R-square	0.10	0.08	0.18	0.53	0.10	0.01	0.59
NOB	26	26	26	26	26	24	26

Robust T-statistics in parentheses. P-values in brackets.

Table 7: Adjustment Effects

Dependent Variable: Resolve, Percentage Point Resolution of CA/GDP after 3 years							
CA/GDP at trough	-0.51 (-3.42)						-0.62 (-3.14)
Preceded by persistent deficit		0.09 (0.10)					-1.37 (-1.04)
CON/GDP growth (-3 to 0)			0.09 (0.80)				0.09 (0.48)
INV/GDP growth (-3 to 0)				0.10 (0.59)			-0.23 (-0.99)
FIS BAL/GDP Growth (-3 to 0)					0.00 (0.04)		0.15 (1.05)
NFA at trough						-0.04 (-1.72)	-0.00 (-0.10)
Constant	1.66 (2.24)	4.47 (6.24)	4.37 (8.91)	4.46 (9.84)	4.51 (9.05)	3.38 (6.95)	1.57 (2.19)
F-test CAtrough=-1	10.67 (0.00)						3.57 [0.08]
R-square	0.56	0.00	0.01	0.02	0.00	0.13	0.64
NOB	26	26	26	26	26	24	26

Robust T-statistics in parentheses. P-values in brackets.

Table 8: US Adjustment

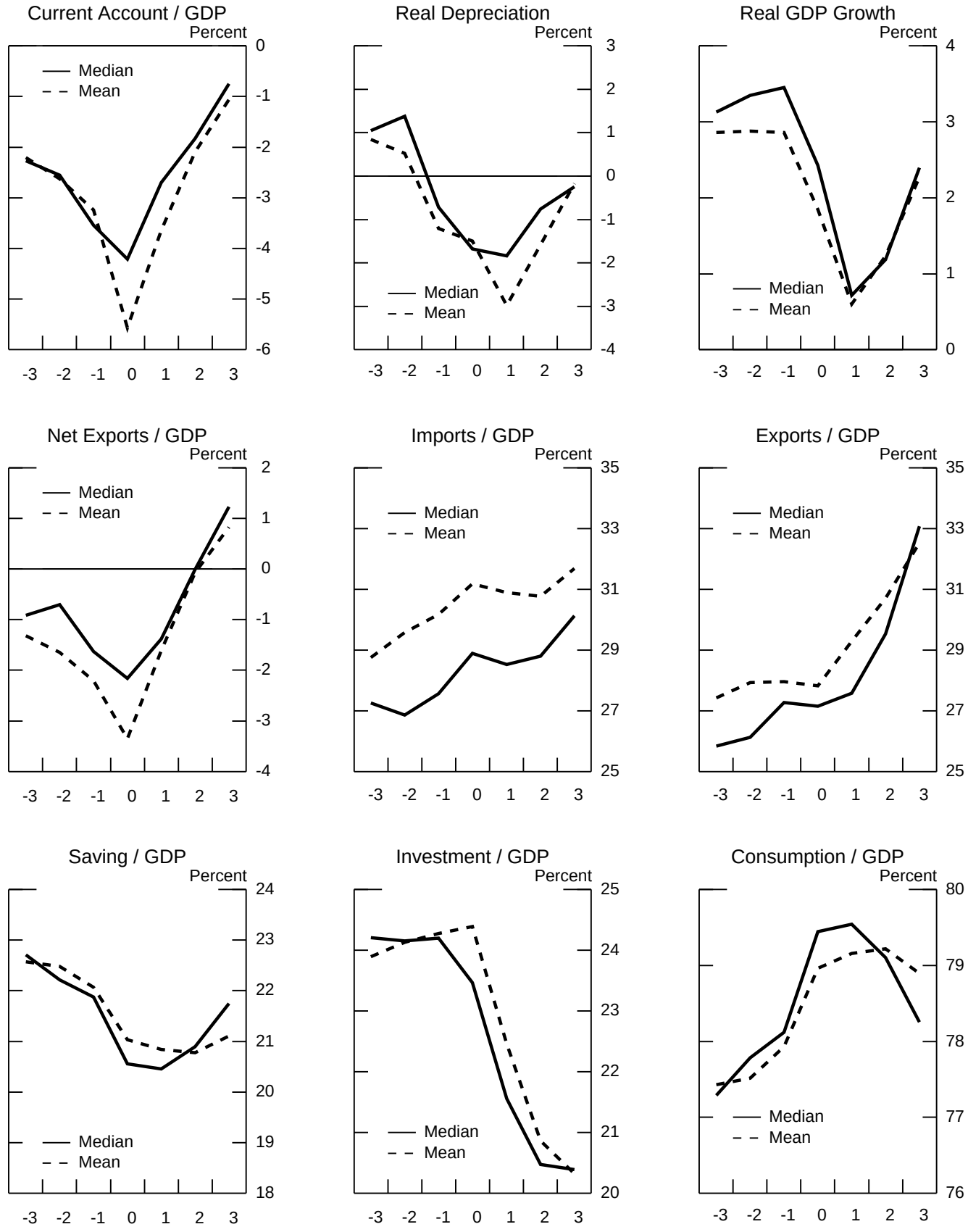
	Total Depreciation	Average Depreciation[a] (Year 0 to 3)	Relative Growth[b]	3 Year Adjustment[b]
1987 Predicted	-22.91	-4.28	-0.81	3.40
1987 Actual	-34.41	-4.25	0.23	2.05
2005 Predicted	-23.66	-2.25	-1.05	4.20

a. Included variable is investment growth, year -3 to 0.
b. Included variables are preceded by persistent deficit and investment growth, year -3 to 0.
c. Included variable is current account trough.

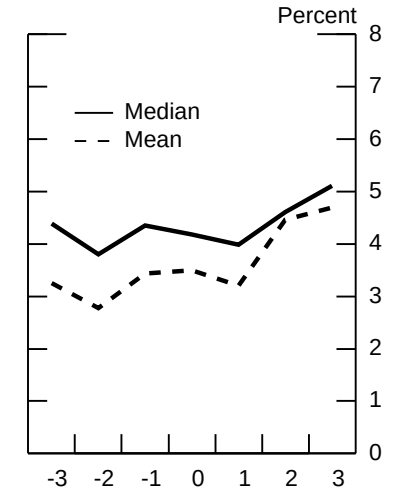
Data Appendix

Average Dep (-): Average depreciation from year 0 to 3, including year 0 depreciation. A depreciation is negative.
CA/GDP at trough: Minimum current account deficit before reversal.
CRISIS: An indicator variable that is one if there was an exchange crisis in that year, as defined by Frankel and Rose 1996.
GDP growth 3yr/3yr: Three-year average GDP growth after reversal (year 0 to 3) relative to three year average GDP growth before reversal.
GDP growth 3yr/LT: Three-year average GDP growth (year 0 to 3) relative to average GDP growth from 1980 to 2003.
Total Dep (-): Total depreciation from peak to trough. A depreciation is negative.
CON/GDP growth: Percentage point growth in consumption in the three years before the reversal.
FIS BAL/GDP Growth: Percentage point growth in the fiscal balance in the three years before the reversal.
INV/GDP Growth: Percentage point growth in investment in the three years before the reversal.
Preceded by persistent: An indicator variable that is one if the reversal was preceded by a persistent deficit.
RESOLVE : The percentage point improvement in the current account in three years (year 0 to year 3).
NFA/GDP: Lane and Milesi-Ferretti (2005) data, equals gross assets minus gross liabilities (scaled by GDP). Defined at the trough of the CA balance.
Gross Liabilities/GDP: Lane and Milesi-Ferretti (2005) data, defined at the trough of the CA balance.
Share of Bond Inflows: Bond inflows divided by overall financial account inflows, averaged over years -3 to 0.
Share of DI/Equity Inflows: Direct investment and equity inflows divided by overall financial account inflows, averaged over years -3 to 0.

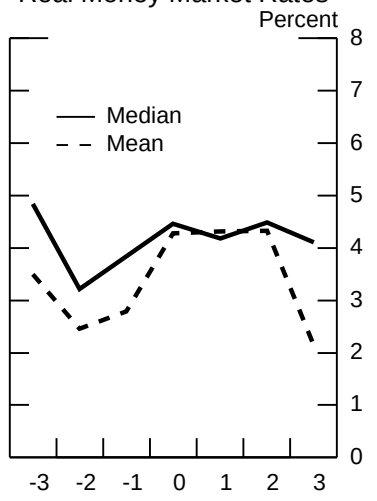
Figure 1


Current Account / GDP
Percent
Median
Mean
Real Depreciation
Percent
Median
Mean
Real GDP Growth
Percent
Median
Mean
Net Exports / GDP
Percent
Median
Mean
Imports / GDP
Percent
Median
Mean
Exports / GDP
Percent
Median
Mean
Saving / GDP
Percent
Median
Mean
Investment / GDP
Percent
Median
Mean
Consumption / GDP
Percent
Median
Mean

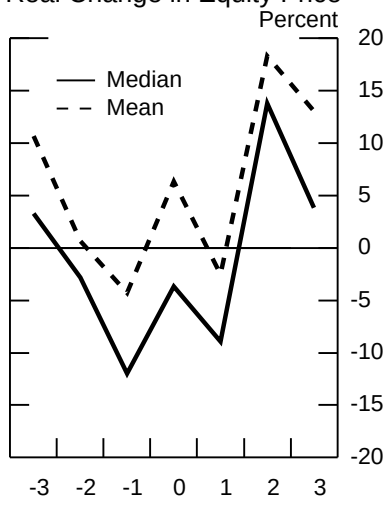
Real Medium Term Bond Rates



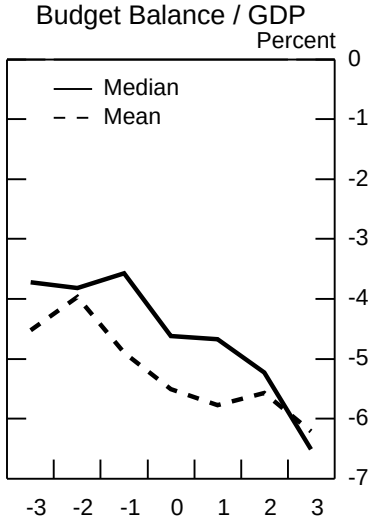
Real Money Market Rates



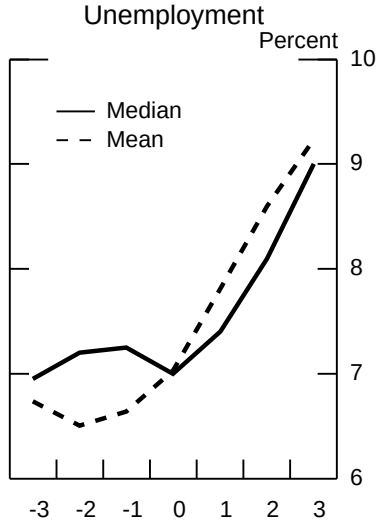
Real Change in Equity Price



Budget Balance / GDP



Unemployment



Reserve Assets

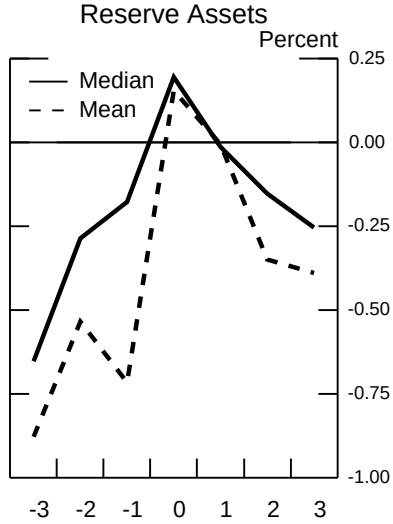


Figure 2

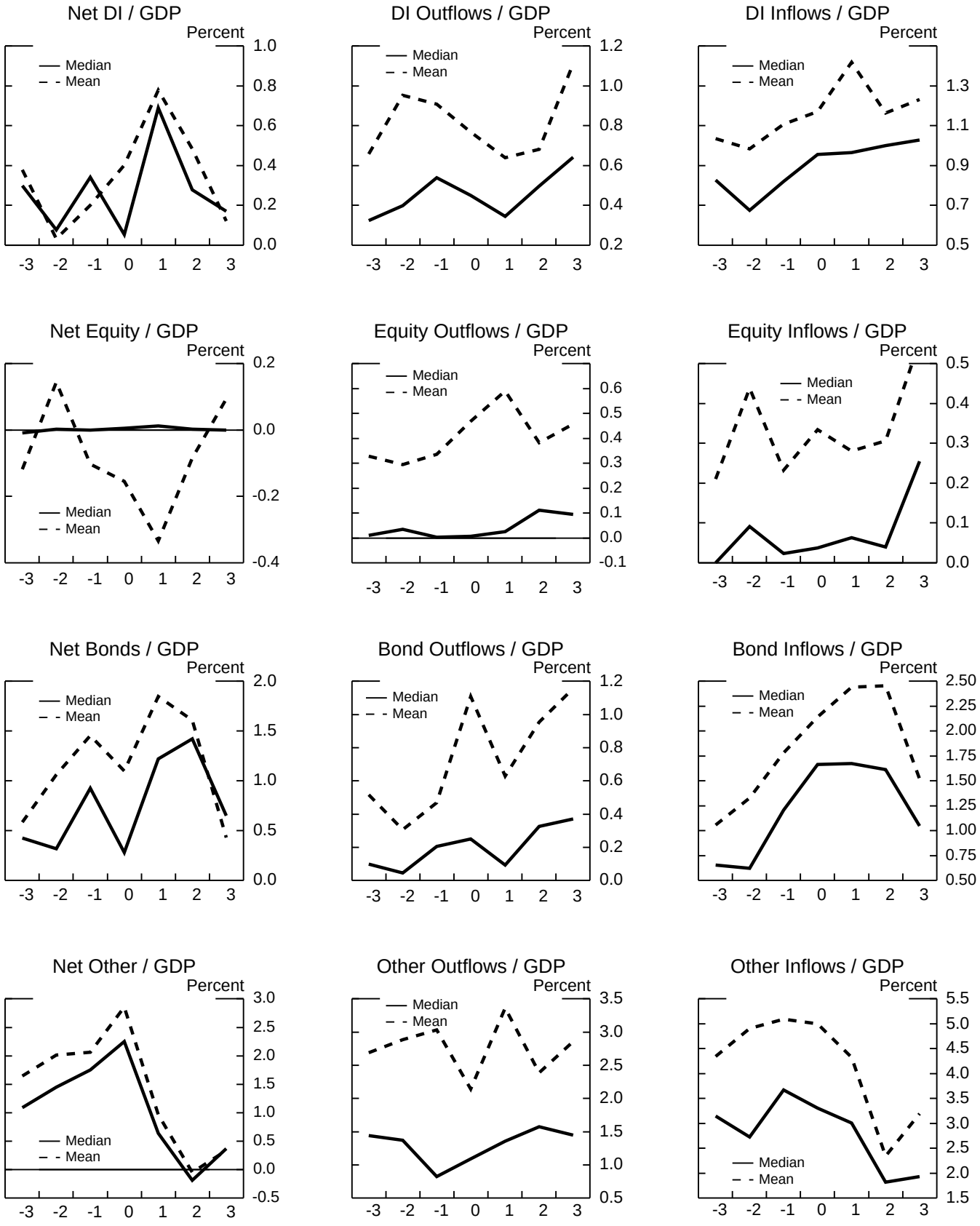
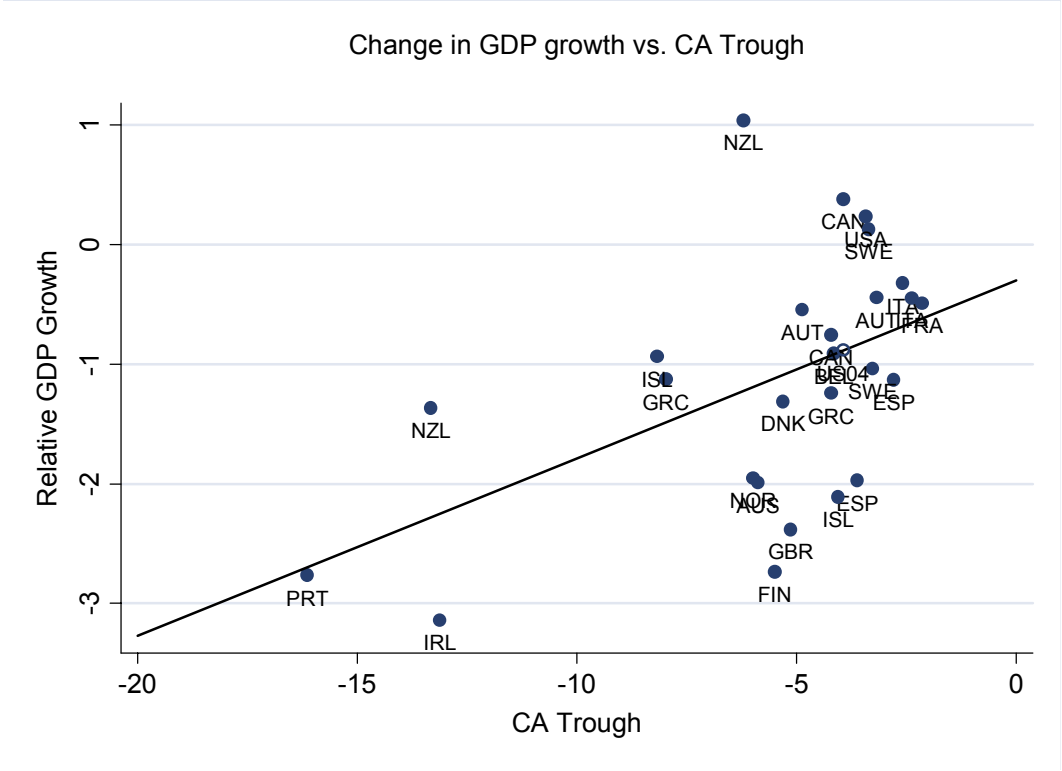

Net DI / GDP
Percent
Median
Mean
DI Outflows / GDP
DI Inflows / GDP
Net Equity / GDP
Equity Outflows / GDP
Equity Inflows / GDP
Net Bonds / GDP
Bond Outflows / GDP
Bond Inflows / GDP
Net Other / GDP
Other Outflows / GDP
Other Inflows / GDP

Figure 3: Real Side Effects

(a)



(b)

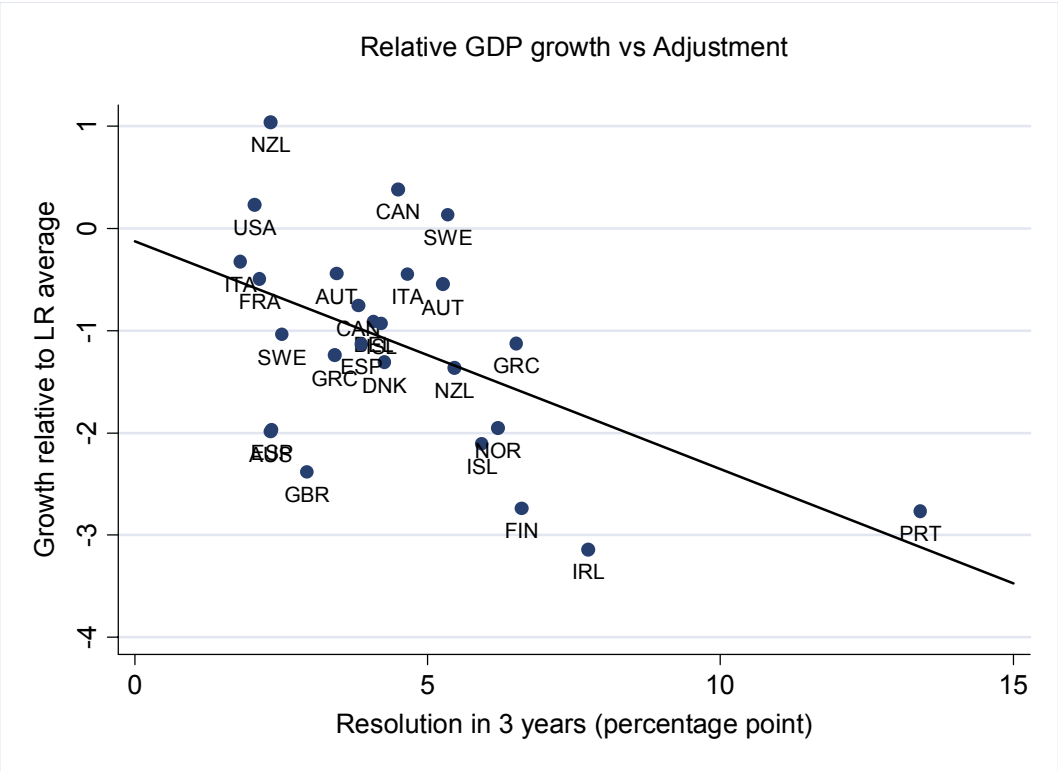
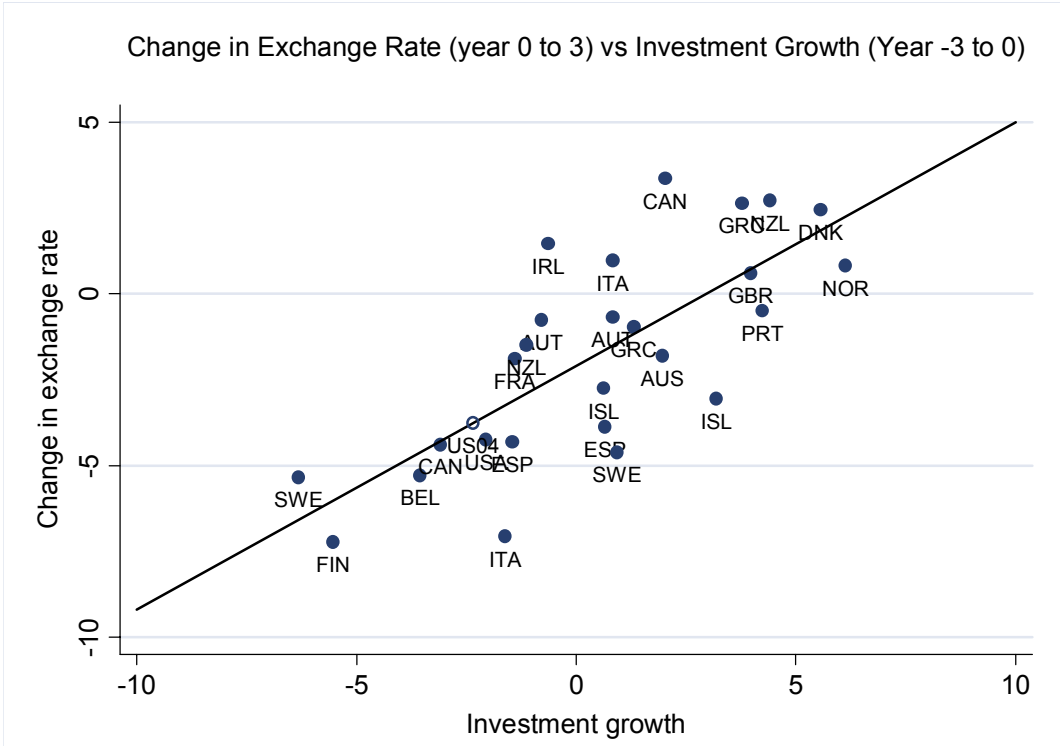


Figure 4

(a)


Change in Exchange Rate (year 0 to 3) vs Investment Growth (Year -3 to 0)
Change in exchange rate
Investment growth
5
0
-5
-10
-10
-5
0
5
10
CAN
GRC
NZL
DNK
IRL
ITA
GBR
NOR
PRT
AUT
AUT
GRC
NZL
FRA
AUS
ISL
ISL
US04
CAN
USA
ESP
ESP
SWE
SWE
BEL
FIN
ITA

(b)

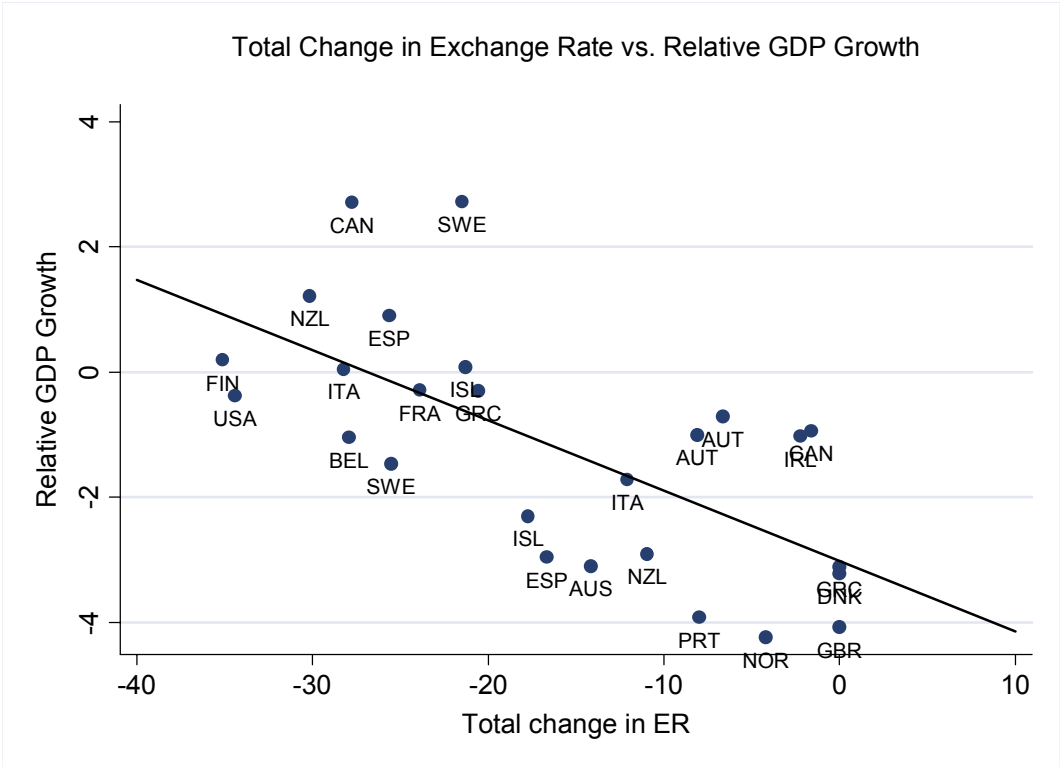
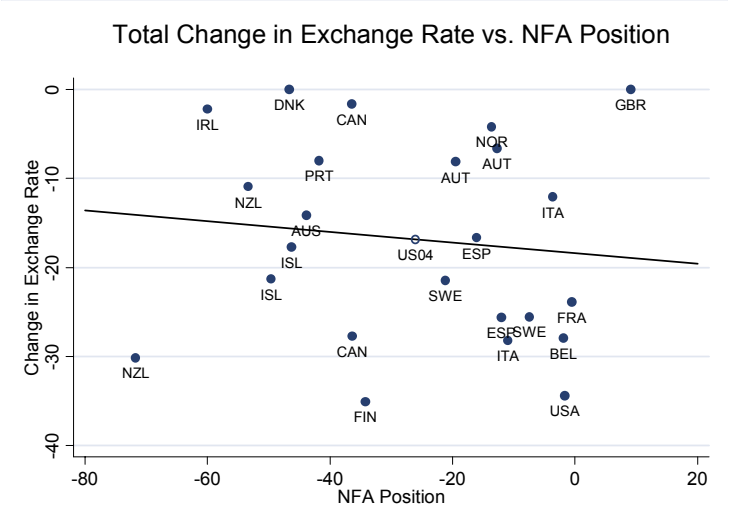
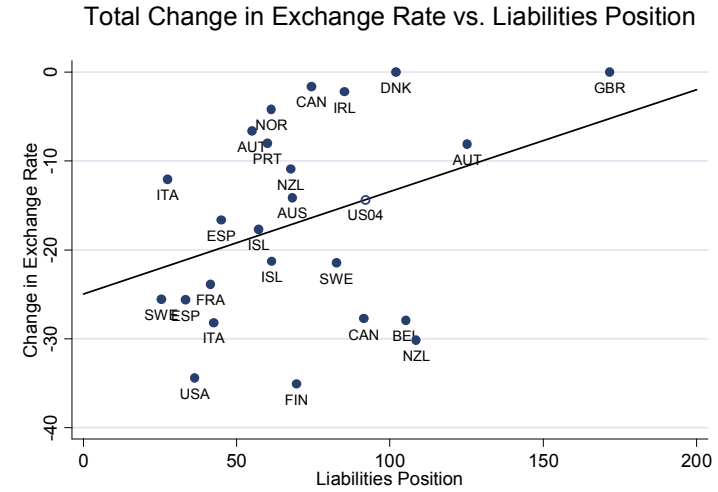

Total Change in Exchange Rate vs. Relative GDP Growth
Relative GDP Growth
Total change in ER
4
2
0
-2
-4
-40
-30
-20
-10
0
10
CAN
SWE
NZL
ESP
FIN
ITA
ISL
USA
FRA
GRC
AUT
AUT
CAN
IRL
BEL
SWE
ITA
ISL
ESP
AUS
NZL
GRC
DNK
PRT
NOR
GBR

Figure 5

(a)


Total Change in Exchange Rate vs. NFA Position
Change in Exchange Rate
NFA Position
0
-10
-20
-30
-40
-80
-60
-40
-20
0
20
DNK
CAN
GBR
IRL
NOR
AUT
AUT
PRT
NZL
ITA
AUS
US04
ESP
ISL
ISL
SWE
FRA
ESP
SWE
CAN
ITA
BEL
NZL
FIN
USA

(b)


Total Change in Exchange Rate vs. Liabilities Position
Change in Exchange Rate
Liabilities Position
0
-10
-20
-30
-40
0
50
100
150
200
DNK
GBR
CAN
IRL
NOR
AUT
AUT
PRT
NZL
ITA
AUS
US04
ESP
ISL
ISL
SWE
FRA
SWE
ESP
ITA
CAN
BEL
NZL
USA
FIN

(c)

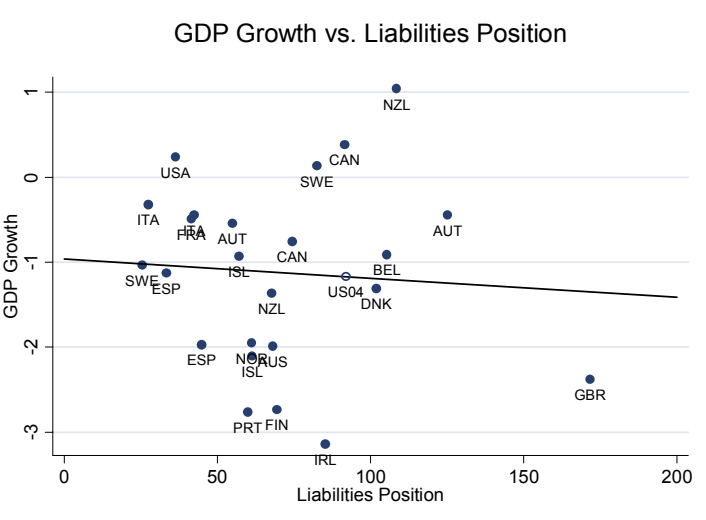
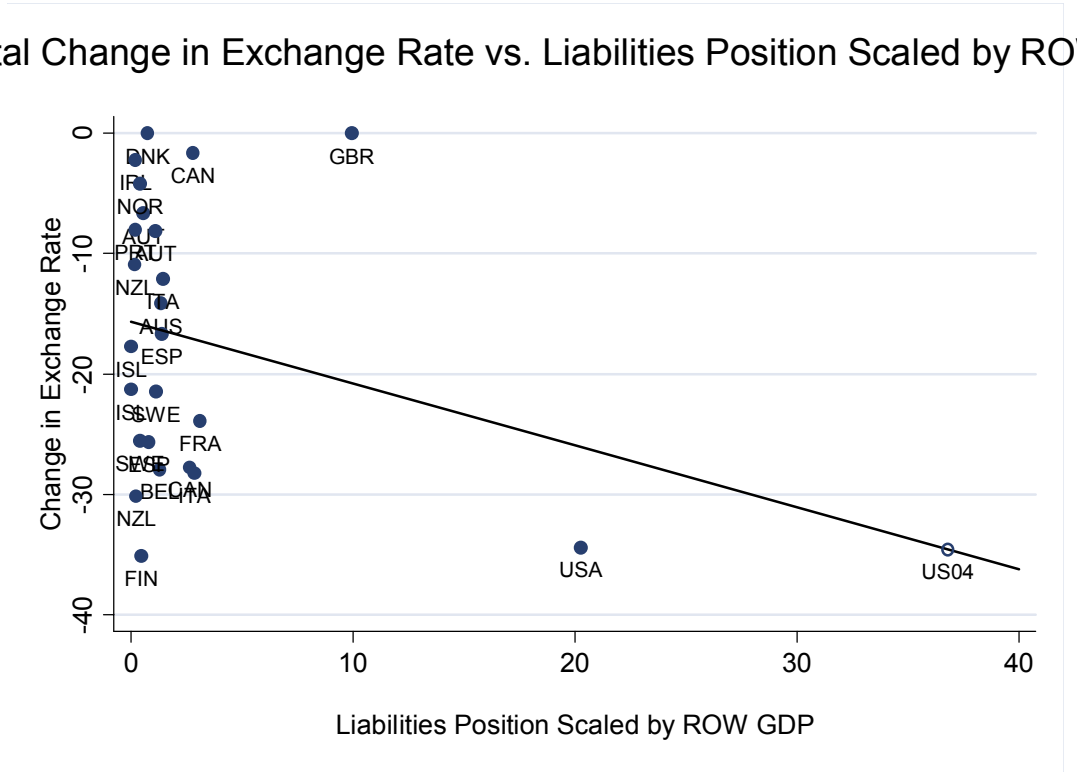

GDP Growth vs. Liabilities Position
GDP Growth
Liabilities Position
1
0
-1
-2
-3
0
50
100
150
200
NZL
CAN
USA
SWE
ITA
AUT
AUT
CAN
BEL
SWE
ESP
ISL
US04
DNK
NZL
ESP
AUS
GBR
PRT
FIN
IRL

Figure 6


Total Change in Exchange Rate vs. Liabilities Position Scaled by ROW GDP
Change in Exchange Rate
0
-10
-20
-30
-40
0
10
20
30
40
Liabilities Position Scaled by ROW GDP
DNK
CAN
GBR
NOR
AUT
NZL
ITA
AUS
ESP
ISL
SWE
FRA
BEL
CAN
ITA
NZL
FIN
USA
US04