Preliminary, comments welcome

External Adjustment and the Global Crisis*

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Abstract

The period preceding the global financial crisis was characterized by a substantial widening of current account imbalances across the world. Since the onset of the crisis, these imbalances have contracted to a significant extent. In this paper we characterize the ongoing process of external adjustment in advanced economies and emerging markets. We start by documenting how countries whose current account balances were in excess of what could be explained by standard economic fundamentals prior to the crisis also experienced the largest contractions in their external balance. We subsequently examine the extent to which the process of external adjustment reflected primarily changes in domestic demand, external demand, or international relative prices, and whether the adjustment process differed between countries with fixed versus flexible exchange rate regimes. We find that in deficit countries external adjustment was achieved primarily through demand compression, rather than expenditure-switching.

Keywords: global crisis, current account adjustment.

JEL Classification: F31, F32

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I. INTRODUCTION

The period preceding the global financial crisis that began in 2008 was characterized by widening current account imbalances across the globe, reflecting a variety of factors: rising oil prices, credit booms and asset price bubbles, and generally easy external financing conditions. Subsequently, the global crisis was associated with a dramatic change in these conditions: sharp declines in asset prices and oil prices, tightening credit, and a drying-up of external finance for several heavily indebted countries, some of which turned to external assistance from the IMF and the European Union. Evidence on the impact of the crisis on output and demand suggests that countries running large current account deficits during the pre-crisis years were the most severely affected with declines in domestic demand being particularly dramatic (Lane and Milesi-Ferretti 2011).

In this paper, we characterize the external adjustment process following the financial crisis. Our hypothesis is that the expansion of current account imbalances went beyond the levels consistent with sustainable medium-term positions. Rather, a benign global financial environment facilitated transitorily-large imbalances as the outcome of low risk aversion among lenders and borrowers coupled with over-optimistic expectations about future growth in deficit countries and amplification mechanisms associated with rising housing and financial asset prices in recipient countries.[1] As a result, a number of countries borrowed heavily, with net external liabilities quickly expanding. For example, the average increase in the net external liabilities of Greece, Ireland, Portugal, and Spain was 30 percent of GDP, and the average increase in the net external liability positions of the Baltics and Hungary was 38 percent of GDP. By the end of 2007, net external liabilities amounted to 77 percent of GDP in the four euro countries and 73 percent in the Baltics. After this rapid expansion in external liabilities, external conditions changed drastically during the crisis, triggering a painful process of current account adjustment.

In our empirical analysis, we first seek to establish the extent to which current account balances prior to the crisis exceeded levels consistent with underlying economic fundamentals. We next ask whether the current account adjustment following the crisis was sharper in countries where pre-crisis "excesses" were more evident. The answer to this question is a resounding yes—countries whose current account balances were in excess of what could be explained by standard economic fundamentals prior to the crisis also experienced the largest contractions in their external balance.

We subsequently examine how external adjustment has taken place. Have real exchange rate movements contributed through an expenditure-switching channel? Or has expenditure reduction been the primary mechanism for the closing of excessive deficits? Has the adjustment experience differed between countries with fixed versus flexible exchange rate regimes? The evidence suggests that the adjustment in deficit countries took place primarily through a compression of output and demand. Real effective exchange rates moved in a direction consistent with current account rebalancing only in countries with an intermediate or floating exchange rate regime, and only to a relatively modest extent.

Finally, we turn to a closer examination of the behavior of capital flows during this period. We ask two questions. First, we investigate what types of flows were associated

[1] On the relation between housing prices and current account balances see, for example, Aizenman and Jinjarak (2008).

with changes in current account balances. Second, we explore the role of official flows, with a primary focus on the role of automatic flows among member central banks within the euro area.

Our contribution is linked to the literature on global imbalances (see, for example, Obstfeld and Rogoff, 2010 and Blanchard and Milesi-Ferretti, 2010 for recent discussions of that literature). However, our focus is on the evolution of the current account balances relative to domestic GDP across a wide range of advanced economies and emerging markets, rather than on the absolute size of cross-border borrowing and lending.

Our paper is also related to the burgeoning empirical literature seeking to explain medium-term current account behavior across countries (see, for example, Chinn and Prasad 2003, Gruber and Kamin 2007, Chinn and Ito 2007, Lee et al. 2008 and Gagnon 2011). While our empirical medium-term current account model is very related to the ones used in those papers, our primary goal is exploit the model to construct a "fitted" current account series that allows us to check whether current account movements after the crisis have gone in the general direction of reducing divergences between actual and fitted current account balances.

In analyzing the adjustment in current account balances, our work is linked to the prior literature on current account reversals and sudden stops (see Milesi-Ferretti and Razin 2000, Edwards 2003, Adelet and Eichengreen 2007 and Freund and Warnock 2007, amongst others). However, that literature largely focuses on samples of country episodes exhibiting a sharp improvement in the current account, where these individual country episodes are drawn from different time periods. Rather, our approach here is to analyze the cross-section of current account adjustment for a specific time period, simultaneously looking at both deficit and surplus countries.

The remainder of the paper is organized as follows. Section II presents some stylized facts about the behavior of current account balances during the crisis and also provides a brief review of the theoretical literature on the external adjustment process in the event of a global financial shock. We turn to empirical analysis of current account behavior and adjustment mechanisms in Section III, while Section IV addresses the behavior of capital flows. Section V concludes.

II THE COMPRESSION IN CURRENT ACCOUNT BALANCES, 2008-2010

Figure 1 plots the standard deviation of the cross-country distribution of current account balances (expressed as ratios to GDP) over the 1995 to 2010 period.[2] The figure captures the sustained increase in dispersion over 1999 to 2008, with an especially sharp increase from 2004 onwards. It also shows that there has been a substantial compression in the distribution of current account balances since 2008, with the standard deviation in 2010 back to its 1998 value.

In Figure 2, we provide a selective view of the size of current account adjustment in different countries and regions. In particular, the figure shows the dramatic reduction in current account deficits in Central and Eastern Europe, the sizable but much smaller

[2] Our focus in this paper is on external balances vis-à-vis each country's GDP, since we are interested in country-level macroeconomic adjustment issues. For other purposes, it would be more appropriate to scale imbalances by global GDP.

reduction in deficits in the euro area periphery, as well as the substantial decline in current account surpluses in China and oil exporters. The figure also illustrates that changes in the "oil balance" did not play a central role in the adjustment, with the rebound in oil prices in 2010 offsetting the decline in the early stages of the crisis.

We view the process of widening current account imbalances during the period preceding the crisis (particularly during 2004-2008) as reflecting a variety of factors, among which asset price booms and easy access to external finance are particularly crucial.[3] The crisis was associated with a sharp increase in risk aversion, declining asset prices, and significant downward revisions to growth expectations for a variety of countries. Indicators such as the VIX on the S&P 500 or the corporate bond spread between AAA-rated and BAA-rated bonds clearly point to tighter financial conditions.

In terms of a conceptual framework, the body of work on 'sudden stops' (that is, rapid narrowing of external imbalances) is clearly relevant for analyzing the experience of deficit countries.[4] In particular, models in which there is a global change in financial conditions are helpful in thinking about the compression in the cross-country distribution of current account imbalances. Furthermore, viewing the crisis as a global financial shock is desirable, since such a perspective is also capable of explaining the enormous decline in gross capital flows during the most acute phase of the crisis (Forbes and Warnock 2011, Milesi-Ferretti and Tille 2011).[5]

Such a global financial shock might be captured by an increase in the risk premium charged on external liabilities or by an increase in financial home bias. For instance, Blanchard et al (2010) develop a model of a small, emerging economy in which these different types of shocks can be analyzed. These authors find that both an increase in financial home bias and an increase in the risk premium are associated with a narrowing of the external balance and a decline in domestic output.[6] Similarly, in the IMF's Global Economic Model, which is a general-equilibrium macroeconomic model of the world economy, an increase in the risk premium on external debt can be shown to deliver a reduction in external imbalances and a decline in output in debtor countries (see, amongst others, Lane and Milesi-Ferretti 2007). The recessionary impact of a sharp decline in net capital inflows is a function of the negative impact on domestic demand in an environment with nominal rigidities. Furthermore, the negative impact on output can be amplified in the presence of credit market frictions by which the associated declines in domestic asset prices generate negative feedback loops through the collateral channel (see Mendoza 2010, amongst others).

Finally, a common theme in this literature is that the impact of a sudden stop will differ across exchange rate regimes (Obstfeld and Rogoff 2001, 2007a, 2007b; Lane and Milesi-Ferretti 2007). Under most configurations, if a country is unable to offset the domestic demand shock through expansionary monetary policy and/or accomplish real exchange rate adjustment through nominal devaluation, the recessionary impact will be larger than in the case of a flexible exchange rate regime.

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[3] See Blanchard and Milesi-Ferretti (2010) for a narrative of the different phases of global imbalances.

[4] Mendoza (2010) is one prominent recent example.

[5] A short cut is provided by Obstfeld and Rogoff (2001, 2007a, 2007b). These authors simply impose a sudden reduction in current account imbalances and work out the implications for real exchange rate behavior. However, since they focus on endowment economies, they cannot provide ancillary hypotheses concerning the behavior of output during sudden stop episodes.

[6] However, the exchange rate response differs across the different types of financial shock.

In summary, the main predictions from the research literature are that an adverse shift in global financial conditions should deliver a narrowing in current account imbalances, with deficit countries experiencing real exchange rate depreciation and a decline in relative output in deficit countries. Moreover, the relative contributions of exchange rate adjustment and output adjustment should differ across exchange rate regimes. We empirically investigate these questions in the next section.

III PRE-CRISIS FACTORS AND CURRENT ACCOUNT ADJUSTMENT

In this section, we ask whether pre-crisis variables help to explain the change in the current account during the crisis. In particular, we address whether the observed current account adjustment during the crisis can be viewed as stabilizing, in sense of correcting "excessive" imbalances that may have emerged during the pre-crisis period. The prevailing narrative of the 2005-2008 period is that sharp increase in the dispersion of current account balances during this period may in part be attributed to a financial environment characterized by low global interest rates, increased risk tolerance among global investors and/or increased risk taking among deficit countries. Under this view, current account imbalances had a transitory component during this period that was due for elimination once the froth in credit markets dissipated.

In order to investigate this question, it is necessary to have an estimate of the "equilibrium" distribution of current account balances, since a zero balance is not the right benchmark for most countries. As is attested by an extensive empirical literature, persistent differences in current account balances can be linked to a set of macroeconomic fundamentals. We intend to capture the transitory component as the deviation from the equilibrium value suggested by these fundamentals.

Accordingly, we proceed by estimating a standard empirical model of medium-term current account determination. By now, this type of estimation is fairly standard (such as Chinn and Prasad, 2003; Gruber and Kamin, 2007; Lee et al., 2008; Gagnon 2011).[7] Subsequently, we use the model to construct a gap measure between current account balances and their model-fitted values for the period 2005-08, and we then examine whether current account adjustment during the crisis is related to the size of this gap measure.

The current account equation is estimated over the period 1969-2008, with the current account and its explanatory variables measured as 4-year averages to smooth business-cycle fluctuations. We consider the following empirical specification:

$$CA_{it} = \alpha + \beta_1 * FBAL_{it} + \beta_2 * YGROW_{it} + \beta_3 * YPC_{it} + \beta_4 * ODEP_{it} + \beta_5 * POPGROW_{it}$$
$$+\beta_6 * AGING_{it} + \beta_7 * OIL_{it} + \beta_8 * NOROIL_{it} + \beta_9 * NFA_{it-1} + \beta_{10} * CRISIS_{it}$$
$$+\beta_{11} * ASIACRISIS_{it} + \beta_{12} * FINCTR_{it} + \varepsilon_{it}$$

where CA_{it} is the current account (expressed as a ratio to GDP), $FBAL_{it}$ is the relative fiscal balance (expressed as a ratio to GDP and measured relative to a weighted-average of the fiscal balance of country i's trading partners), $YGROW_{it}$ is the GDP growth rate

[7] In some cases (such as Lane and Milesi-Ferretti 2002), the focus is on equilibrium net foreign asset positions rather that the equilibrium current account balance.

(measured relative to a weighted-average of the growth rates of country i's trading partners), YPC_{it} is relative level of PPP-adjusted GDP per capita (measured in logs and relative to a weighted-average of country i's trading partners), $ODEP_{it}$ is the old-age dependency ratio (measured relative to a weighted-average of country i's trading partners), $POPGROW_{it}$ is the population growth rate (measured relative to a weighted-average of country i's trading partners), $AGING_{it}$ is the difference between the projected old-age dependency ratio in $t+20$ and the current old-age dependency ratio, OIL_{it} is the net export position in oil (expressed as a ratio to GDP), $NOROIL_{it}$ is an interaction term between the oil balance and a Norwegian country dummy, NFA_{it-1} is the lagged value of the net foreign asset position (say, NFA at end-2004 for the 2005-08 period), expressed as a ratio to GDP, $CRISIS_{it}$ is a dummy variable capturing whether a country is experiencing a major economic crisis in year *t*, $ASIACRISIS_{it}$ is a dummy variable that takes the value 1 for 1997-2000 for those Asian economies at the center of the Asian financial crisis and 0 otherwise, $FINCTR_{it}$ is a dummy variable capturing whether a country is a major center for international financial trade, and *LTT* are the terms of trade.

The selection of regressors largely follows the specifications reported in the previous literature. In particular, this general approach is also employed by the IMF in assessing medium-term current account equilibria (see Lee et al 2008). Where appropriate, variables are measured in relative terms, since only idiosyncratic shifts in fundamentals should affect the current account. The inclusion of the relative fiscal balance is motivated by the many factors that can induce a departure from Ricardian Equivalence (see also Lane and Milesi-Ferretti 2002). The relative output growth rate is included to capture the strength of convergence factors, and is expected to be negatively correlated with the current account balance. The relative level of GDP per capita is included to capture the convergence process—to the extent that the income level is a proxy for the marginal product of capital.

The three demographic variables (old-age dependency ratio, population growth rate and the ageing rate) are included, since demographic variables may be expected to influence both saving and investment behavior. Specifically, the population growth rate would be expected to have a negative effect on the current account balance (as the very young do not save); the same for the old-age dependency ratio (defined as the ratio of the population aged 65 and older to the working-age population). The third demographic variable—the ageing rate—is new in the literature.[8] It is defined as the expected change in the old-age dependency ratio in the future (constructed as the difference between the age dependency ratio in year t+20 and the ratio in year t, where the t+20 estimate is based on United Nations population projections). Ceteris paribus, we would expect countries where the population is getting old more rapidly to have higher saving.

The oil balance is included in recognition that fluctuations in the oil price induce smoothing behavior by oil importers and oil exporters. We also allow the oil balance to play a different role for Norway, in view of the country-specific institutional arrangements that govern the management of its oil revenues.

[8] See also Lane (2010).

The lagged value of the net foreign asset position is included since the steady-state current account balance should be proportional to the equilibrium net foreign asset position in a growing economy. The financial crisis dummy is included to capture the disruption in access to capital markets for countries undergoing a financial crisis, and is expected to have a positive coefficient. In similar vein, the Asia crisis dummy captures the specific disruptions associated with the 1997-2000 period in Asia. The financial center dummy is relevant, in view of the possible measurement errors in tracking net capital flows for centers of international wholesale asset trade.

Our country sample includes 66 advanced economies and emerging markets (listed in the Appendix). We exclude countries that are oil exporters as well as countries with per capita income in 2007 below $1000 and very small countries (with GDP below $20 billion in 2007). The rationale for excluding oil exporters is the extreme dependence of their current account balance on the price of oil. The rationale for excluding low-income countries is two-fold: first, the evolution of their current account balance is affected by specific factors such as external aid, and second, many of these countries had periods of extreme current account deficits followed by debt reduction and debt forgiveness agreements. In turn, this hinders the ability to conduct meaningful inference on the impact of standard macroeconomic and structural fundamentals on the current account. Finally, very small countries may have outsized current account volatility because of factors such as lumpy imports.

The results are presented in Table 1. In column (1), we report results for the whole sample; in column (2), we restrict the sample to the set of advanced economies; and we show results for the emerging market subsample in column (3). Columns (4)-(6) repeat the analysis for a specification which also includes the terms of trade (in addition to the oil balance).

In terms of the full-sample results, the specification explains 45 percent of the variation in the current account balances. In terms of individually significant coefficients, the fiscal balance is positive with an estimated coefficient of 0.24, such that an improvement in the fiscal balance of four percentage points of GDP is associated with a one percentage point improvement in the external balance. In addition, an increase in the relative level of output per capita is correlated with an improvement in the external position. In terms of demographic patterns, an increase in the old-age dependency ratio is associated with a decline in the current account.

The key role of the commodities terms of trade is highlighted by the significant co-movement between the oil balance and the current account. In terms of crisis episodes, the general crisis dummy is significantly positive, with a further positive effect associated with the Asia crisis in particular.

The results in columns (2) and (3) show that many results are quite similar across the advanced and emerging market subsamples. However, the overall explanatory power is twice as large for the advanced group as for the emerging group. In addition, the relative level of GDP per capita plays no role in explaining intra-group variation in external balances. There is also a striking difference in demographic patterns. For the advanced economies, the main demographic effect is that those countries that face a more rapidly ageing population run more positive current account balances, while the current account negatively commoves with the old-age dependency ratio and the rate of population growth for the emerging group. Finally, within this period, financial crises are a

significant influence on the current account balances of emerging economies but not for advanced economies. Finally, the pattern of results is quite similar for the regressions in columns (4)-(6); in addition, we find some evidence that stronger terms of trade are associated with improvements in the current account balance for emerging markets.

Figure 3 illustrates the capacity of the model to explain the cross-country distribution of current account balances by scattering the actual current account balances for the 2005-2008 cross-section against the fitted values from equation (4) in Table 1. As is clear from the chart, the fit is quite high, with a correlation of 0.74. Two factors contribute to the worse fit for emerging markets, particularly for recent years. The first is the pattern of current account surpluses in emerging Asia after the 1997 crisis. While the Asian crisis dummy captures the turnaround in the current account during the period 1997-2000, the surpluses persisted in several countries in subsequent years as well. The second factor is the very large current account deficits in a number of emerging European economies, such as Bulgaria and the Baltics.[9]

Next, we construct a measure of the current account "gap" as the difference between the actual average current account balance during 2005-2008 (the final four-year interval in our sample) and the fitted value from the estimated regression

$$CAGAP_{i0508} = CA_{i0508} - \widehat{CA}_{i0508}$$

We consider $CAGAP_{i0508}$ as potentially a good proxy for the extent of "excess" current account imbalances during the immediate pre-crisis period, in sense that the gap measure reflects current account positions that cannot be linked in a systematic fashion to the fundamentals included in our benchmark specification. To the extent that the benchmark regression does a good job in capturing the medium-term behavior in the current account, we should expect that those countries with the largest negative gaps should experience the largest subsequent current account improvement during the crisis period and/or should experience the greatest adjustment pressures (as might be captured by real exchange rate and relative demand movements on the real side and capital market pressures on the financial side.)

We use the fitted values from column (1) in Table 1 to calculate the gap measure. This measure is quite robust to alternative specifications to estimate equilibrium current account balances. For example, using the fitted values from the sub-samples reported in columns (2) and (3) in Table 1 generates gap measures that have a correlation above 0.9 with our measure. There are similarly high correlations if we use the expanded current account measure reported in columns (4)-(6) of Table 1. Moreover, if we add extra variables to the current account equation (such as current or capital transfers), this makes little difference to the cross-country variation in the gap term for 2005-2008.

Figure 3 plots the change in the current account between 2008 and 2010 against $CAGAP_{i0508}$ in Figure 3. The correlation is clearly negative and very strong, even if we omit the most extreme cases of current account gaps and current account adjustment: the Baltics, Bulgaria, and Iceland.

[9] Gagnon (2011) obtains a much better "fit" for lower-income countries in his current account regression model. The reason is the inclusion of official capital flows as an explanatory variable for current account balances—for lower-income countries in particular these are the dominant form of flows.

We next turn to regression analysis of the relation between the current account gap measure and current account adjustment during the crisis period. We also condition on the outstanding stock of net foreign assets at the onset of the crisis, since a global increase in risk aversion may have placed pressure on those countries with the largest outstanding stock of net foreign liabilities, regardless of the level of the current account balance relative to fundamental factors. Accordingly, our baseline regression takes the following form

$$\Delta CA_{i08-10} = \alpha - \delta CAGAP_{i0508} + \gamma NFAY_{i07} + \upsilon_i$$

where we expect the improvement in the current account balance between 2008 and 2010 to be greatest for those countries with the largest negative current account gaps and—potentially—the largest net foreign liability positions.

We run this regression on a variety of country samples. In addition to the full sample of 66 countries, we also split the sample between countries that adhere to de facto pegged exchange rate regimes and non-pegging countries. The sample of peggers is dominated by EU countries—it includes all euro area countries plus Bulgaria and the Baltics, in addition to a few others such as Hong Kong S.A.R.. Furthermore, we also report variations within these sub-samples. Among the peggers, we drop the Baltic states from some specifications. Among the non-peggers, we drop Iceland from some specifications, given the particularly large depreciation associated with the effective shut-down of the ISK market during its crisis. Finally, as an alternative to running separate sample splits, we also report full-sample results but with interaction terms to allow for differential effects across exchange rate regimes.

The results are shown in Table 2. Column (1) shows the baseline full-sample estimates. The gap measure is significant at the 1 percent level. The estimated coefficient of 0.63 means that approximately two thirds of the measured current account gap was closed over the 2008 to 2010 period for the typical country in the sample. In addition, the net foreign asset position is marginally significant at the 10 percent level in this specification. The estimated coefficient is small at 0.01, which means that a net foreign liability position of 100 percent of GDP only induces a one percentage point improvement in the current account balance over 2008 to 2010 (for a given current account gap).

We split the sample between peggers and non-peggers in columns (2) and (3). The gap measure is highly significant for both groups. However, the estimated coefficient is twice as large for the peggers than for the non-peggers. For the peggers, the estimated coefficient of 0.95 means that the gap was nearly entirely eliminated over the 2008 to 2010 period, whereas only half the gap was closed for the non-pegger group. When we combine both groups into a single regression but allow for interaction terms with the exchange rate regime, the difference across groups in terms of the gap coefficient is large and significant at the 5 percent level.

The estimated coefficients do fall for both groups when extreme observations—such as Baltic countries and Iceland—are dropped in columns (4)-(6). The gap coefficients remain highly significant and the difference across groups remains large in the split regressions reported in columns (4) and (5). While the point estimate of the difference across groups is of similar magnitude in the integrated regression in column (4), it is not

statistically significant. Finally, the net foreign asset position is never significant once we condition on the exchange rate regime.

We next try to shed some light on the underlying mechanisms by which external adjustment took place during this period. Specifically, we estimate the relationship between the estimated current account gap for the period 2005-08 and the subsequent cross-country variation in real exchange rate movements and relative demand and output movements during 2008-2010. That is, we run regressions of the form

$$\Delta RER_{i08-10} = \alpha - \delta CAGAP_{i0508} - \gamma NFAY_{i07} + \upsilon_i$$
$$\Delta DD\_DIFF_{i08-10} = \alpha - \delta CAGAP_{i0508} - \gamma NFAY_{i07} + \upsilon_i$$
$$\Delta Y\_DIFF_{i08-10} = \alpha - \delta CAGAP_{i0508} - \gamma NFAY_{i07} + \upsilon_i$$

where ΔRER_{i08-10} is the log change in the real exchange rate between 2005-08 and 2010, DD_DIFF_{i08-10} is the log change in domestic demand and ΔY_DIFF_{i08-10} is the log change in relative output. We expect those countries with larger current account gaps to be under greater pressure to undergo real depreciation and/or experience a relative decline in domestic demand and output. As in the current account regressions, we also control for the initial net foreign asset position.

The results for the real exchange rate are shown in Table 3. The current account gap and the net foreign asset position have no explanatory power in the baseline full-sample regression reported in column (1). However, these variables are significant once the sample is split between peggers and non-peggers in columns (2) and (3). In relation to the non-pegger group, the pattern of real exchange rate adjustment is stabilizing, with those countries with large negative current account gaps and large net foreign liability positions experiencing real depreciation. However, results appear to be driven primarily by Iceland—a country with a sizable negative current account gap that experienced a very large real depreciation (column 5). Once Iceland is excluded, the current account gap explains only a very small fraction of real exchange rate changes. We instead find some evidence that high pre-crisis net foreign assets were associated with subsequent appreciations.

Within the pegging group, observed real exchange rate movements have been "destabilizing," in the sense that those countries with large negative current account gaps and large net foreign liability positions have experienced real exchange rate appreciation (columns (3) and (6)). This result also reflects the euro appreciation during this period (euro area countries and countries pegging to the euro dominate this sample) coupled with the fact that a number of these countries had large negative current account gaps. This pattern also applies in the integrated regression in column (4), and once we exclude extreme observations in column (7).

We turn to an examination of relative domestic demand dynamics in Table 4. External adjustment for deficit countries requires a reduction in the level of domestic demand relative to the level of domestic demand in trading partners. The full-sample estimates in column (1) show that relative domestic demand grew more slowly, the more negative was the current account gap measure and the larger was the initial net foreign liability position. Moreover, columns (2) and (3) show that the current account gap measure is significant in the subsample for non-peggers but not for peggers. The results in column (4) show that the difference in gap coefficients across regimes is not statistically

significant. The estimated coefficient of 1.19 indicates that relative domestic demand growth falls by 1.19 percentage points for every percentage point that the current account balance is below its equilibrium value. This magnitude seems reasonable in view of standard estimates of import expenditure elasticities. Finally, peggers on average experienced substantially slower relative demand growth than non-peggers during this period, with the peg dummy estimated at minus 5 percentage points. The results are quite similar once the special cases are dropped in columns (5)-(7). As before, the only difference is that the magnitude of the gap coefficient drops for the narrower samples.

We turn to relative output dynamics in Table 5. If real exchange rate movements do not deliver sufficient expenditure switching, a reduction in relative domestic demand will map into a reduction in relative output. The results in column (1) show that negative values for the current account gap variable are indeed associated with more negative relative output growth and this variable is significant at the one percent level. It is striking that the sample split regressions reported in columns (2) and (3) show that this result also holds within the non-pegger group but is not significant in explaining relative output variation within the pegger group. The point estimate of 0.68 in column (4) indicates that relative output falls by two thirds of the size of the current account gap. By comparison with the estimates for relative domestic demand in Table 4, this is smaller but still represents a sizeable impact. Consistent with Table 4, column (4) also records that the pegger group had much smaller growth in relative output than the non-pegger group. The results are generally similar once the special cases are excluded in columns (5)-(7). Finally, the net foreign asset position is nowhere significant in Table 5.

In summary, Tables 2-5 provide a multi-dimensional perspective on how the external imbalances that expanded during 2005-2008 affected country experiences during the subsequent adjustment phase. The regression analysis shows that there has been substantial closure of current account gaps. While real exchange rate adjustment played a modestly positive role within the group of non-peggers, the direction of real exchange rate movements was, if anything, destabilizing within the group of peggers. However, negative current account gaps were associated with sharp declines in relative domestic demand and drops in relative output. Accordingly, the distribution of current account gaps at the onset of the crisis is a good predictor of the distribution of macroeconomic outcomes during the crisis period itself.

Next, we provide a supplementary analysis of the inter-relations between current account adjustment, real exchange rates, relative domestic demand, and relative output during the crisis period. First, Figures 5-7 show the scatter plots of the real exchange rate, relative domestic demand and relative output against the change in the current account balance between 2008 and 2010. Figure 5 shows that changes in current account balances are negatively correlated with changes in real effective exchange rates in countries with a floating exchange rate, but not so in countries with a fixed exchange rate—for example, the four currency-board countries in the EU (the Baltics and Bulgaria) experienced dramatic current account corrections without any real depreciation. Instead, Figures 6 and 7 show that changes in current account balances are strongly correlated with changes in relative domestic demand and relative output—in particular, the compression of current account deficits was generally associated with very sharp declines in domestic output and demand relative to the pre-crisis period.

Second, we examine the joint distributions among these variables in more detail by partitioning countries according to the scale of changes in the current account balance

during the crisis. We divide the sample into quartiles in terms of the magnitude of current account changes. We report key statistics for the top quartile (that is, countries with large current account improvements), the middle two quartiles, and the bottom quartile (that is, countries with large declines in the current account). For each quartile, we report statistics for all countries in that quartile. In addition, to gain further insight and to match the regression analysis above, we subdivide each quartile between peggers and non-peggers.

Table 6 shows the results. Panel A shows the distribution of real exchange rates for each quartile, while Panels B and C show statistics for relative domestic demand and relative output respectively. Panel A confirms that many aspects of the full-sample distribution of real exchange rate changes are not too different between the top and bottom quartiles in terms of current account adjustment. There is some evidence of real exchange rate differences between non-peggers and peggers but these are not very large.

As was discussed earlier, the pattern of real exchange rate adjustment for peggers may be driven by several factors. First, if there is persistence in wage or price setting, inflationary momentum that built up in peggers running current account deficits during the pre-crisis boom period may dissipate only slowly. Second, trade-weighted real exchange rates also depend on fluctuations between the anchor currency and other global currencies (Honohan and Lane 2003, Chen et al 2010). For instance, the euro appreciated by about 10 percent against the dollar during 2008-2010, causing an appreciation in the trade-weighted real exchange rates of the periphery deficit countries in view of their dependence on extra-euro area trade.

The distribution of relative domestic demand growth is very different across the quartiles in Panel B. The median growth in relative domestic demand was minus 9 percentage points for the top quartile, while it was plus 15 percentage points for the bottom quartile. The difference in relative domestic growth is also striking but less dramatic in Panel C (minus 3 percentage points versus plus 13 percentage points). In terms of exchange rate regimes, the same pattern applies for both peggers and non-peggers but the dispersion in relative domestic demand and relative output is much wider for the former group relative to the latter group.

In this section, we have examined the relative contributions of real exchange rate movements and relative demand levels in current account adjustment during the crisis. In some countries, large real exchange rate movements have been possible due to shifts in nominal currencies. In others (operating in a monetary union or under a currency board or other 'hard fix'), the scope for real exchange rate adjustments has been more limited. However, by and large, current account adjustment in deficit countries has clearly relied more on "expenditure reduction" than "expenditure switching." An open question is the extent to which current account balances in deficit countries in 2010 reflect sizable negative output gaps, and the attendant implications for the persistence of the current account adjustment process.

IV CURRENT ACCOUNT BALANCES AND NET CAPITAL FLOWS DURING THE CRISIS

In the preceding section, we focused on the real implications of the compression in current account balances. In this section, we address some issues concerning financial

account behavior.

We begin in Table 7 by reporting the key statistics for the main categories of net capital flows, again partitioning countries according to the scale of current account adjustment between 2007 and 2010. We define net capital flows for each category as the difference between net inflows and net outflows, so that a positive value indicates capital flowing to the country and viceversa. We then take the difference between net capital flows in 2010 and net capital flows in 2007. The capital flow categories are foreign direct investment, portfolio investment (including equity and debt securities), foreign exchange reserves, and "other investment", a category comprising flows such as loans, deposits, and trade credits. In terms of whole-sample patterns, the other investment category is where there is the biggest difference in net capital flow behavior across quartiles. The median net outflow in this category is 7 percentage points of GDP for the top quartile group, whereas is there is a median net inflow of ½ percentage point for the bottom quartile group. This is consistent with the evidence on gross capital flows reported by Milesi-Ferretti and Tille (2011), who show that bank flows have experienced the greatest turnaround during the crisis. In contrast, there are no strong differences in behavior across quartiles in terms of portfolio flows (whether debt or equity), FDI or official reserves.

Table 8 relates the size of the current account gap in 2005-08 to the size of change in net capital flows between 2007 and 2010. It partitions the sample between pegs and other exchange rate regimes, and focuses on countries with large current account gaps (2 percent of GDP or above in absolute terms). The first two rows of the table (upper and lower part) highlight the already-documented compression in current account imbalances in countries with large gaps. Subsequent lines confirm the result shown in Table 8 concerning the importance of shifts in net other investment flows in financing the shift in current account balances. They also highlight how this shift was particularly large in countries with an exchange rate peg—net inflows declined by 6 percent of GDP on average in countries with large negative current account gaps ("excess deficits"), and increased by over 10 percent of GDP in countries with positive current account gaps. The corresponding changes for other exchange rate regimes are much more modest. These results are confirmed in simple regression analysis: the current account gap is a strong predictor of subsequent changes in other investment inflows for pegged exchange rate countries, but a weak predictor for other exchange rate regimes. [10]

A number of countries in our sample obtained sizable external assistance during the crisis period: Belarus, Greece, Hungary, Iceland, Latvia, Romania, and Serbia received loans from the International Monetary Fund exceeding 200 percent of their IMF quota during the period 2008-10, as well as loans from the European Union. In addition, banks in Greece, Ireland, and Portugal (and to a lesser extent Italy and Spain) benefited from liquidity provision from the European Central Bank channeled through domestic central banks. External assistance is typically reflected in higher other investment inflows: this implies that the turnaround in non-official net other investment inflows is understated by the figures presented in Tables 7 and 8 (note that virtually all the countries receiving external assistance had negative current account gaps in 2005-08, according to our measure).

In specific relation to members of the euro area, a potentially important factor may have

[10] Results available from the authors.

been access to ECB liquidity as a replacement for private-sector capital flows during the crisis.[11] Although data on monetary authority financing is patchy and difficult to fully reconcile with balance of payments data, we explore this notion in a couple of different ways. In Table 9, we ask whether adjustment behavior during the crisis was different for euro area countries than for other countries.[12] We do this by asking whether the responsiveness of the current account to the initial gap measure and the initial net foreign asset position was markedly different for the euro area by running regressions with euro dummy interactions. That is, the specification is

$$\Delta X_{it} = \alpha + EURO_{it} - \delta CAGAP_{i0508} - \gamma NFAY_{i07} + \phi_1 * CAGAP_{i0508} * EURO_{it} + \phi_2 * NFAY_{i07} * EURO_{it} + \upsilon_i$$

where X_{it} is the adjustment indicator in question and $EURO_{it}$ is a dummy variable for membership of the euro area. Positive values for the coefficients on the interaction terms would indicate weaker adjustment pressures for members of the euro area. We run these regressions for two samples: the full sample and the sample of peggers.

We show the results in Table 9. The change in the current account is the dependent variable in columns (1) and (2); it is the change in the real exchange rate in columns (3) and (4); relative domestic demand in columns (5) and (6); and relative output in columns (7) and (8).

The full-sample results in column (1) do not indicate that linkage between the gap measure and the scale of current account adjustment has been significantly weaker inside the euro area. However, the coefficient on the initial net foreign asset position is significantly different for members of the euro area—whereas large net foreign liabilities are associated with greater adjustment for other countries, it is associated with less adjustment for euro area members. If we confine attention to the sample of peggers in column (2), this result still applies. Moreover, while the gap measure is significant for both non-euro and euro members, the magnitude of the coefficient is significantly smaller for the euro area.

In relation to the ancillary variables, column (3) shows that euro member countries collectively experienced more real depreciation than other countries. However, among the set of peggers, column (4) indicates that the current account gap measure exerts pressure on the real exchange rate for non-euro countries but not for euro countries. Finally, according to the results in columns (5)-(8), membership of the euro area does not affect the relation between the fundamentals and changes in relative domestic demand and relative output.

One candidate explanation for the weaker pressure for current account adjustment inside the euro area (relative to other peggers) is that liquidity financing from the ECB has cushioned the adverse impact from the reversal in private capital flows. By way of contrast, there was no similar quasi-automatic replacement of private flows in the Baltic

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11 In addition, other types of official flows (EU/IMF loans to Greece, Ireland, Latvia and some other countries in emerging Europe) played a role in cushioning the sudden stop in private flows. We will provide a complete discussion in the next draft, as the full breakdown of capital flows for 2010 becomes available.

12 There is an extensive literature concerning the impact of the euro on current account behavior. See Eichengreen (2010) for a recent overview.

countries or Bulgaria, such that the sudden stop induced more rapid closing of the current account gap for these non-euro countries. Indeed, this is a key mechanism that defines the difference between membership of a currency union with a common central bank and membership of a currency board with no access to the liquidity operations of the anchor central bank.

We provide some evidence on the importance of the Eurosystem as a conduit for capital flows during the crisis in Table 10. The table shows net capital flows via the central bank for each member of the euro area periphery, where the national central bank is the intermediary for liquidity funding from the ECB. The table shows central bank flows were trivial during the pre-crisis period but became very large for Ireland, Greece and Portugal in 2010.

Finally, we also investigated whether countries that received official assistance undertook more or less current account adjustment. Results are a priori ambiguous. On the one hand, access to official external finance clearly limits the need for an adjustment in net capital flows. On the one hand, access to external assistance is not random or exogenous—countries that received external finance were likely among those where the turnaround in private flows was more dramatic and hence where the current account adjustment may have been larger. The empirical results are indeed mixed. For the pegger group, an official assistance dummy is significantly negative—this implies that these countries undertook less current account adjustment, all else equal, once we control for the size of the current account gap and the initial net external position. For the non-pegger group, the relation between current account gap and subsequent current account adjustment is weaker, as already documented in Table 2, and the coefficient on the official assistance dummy is instead positive (implying that these countries undertook more adjustment for a given CA gap). These patterns are suggestive but require further investigation, since they don't control for the size of net external finance.

V CONCLUSIONS

The sudden compression in the distribution of current account balances between 2008 and 2010 provides a laboratory for studying the economics of external adjustment. In our empirical work, we find that cross-country pattern in current account changes during this period worked to correct "excesses" that had emerged during the pre-crisis period. In terms of adjustment mechanisms, countries that experienced the largest improvements in current account balances had deeper recessions than other countries. The behavior of real exchange rates diverged across non-pegger and pegger groups, with the real exchange rate broadly moving in a stabilizing direction only for the former group.

In relation to the financial account, we find some suggestive evidence that the scale of current account adjustment in countries with a pegged exchange rate, and in the euro area in particular, has been cushioned by official capital flows—IMF and EU loans but importantly ECB liquidity funds compensated for the exit of private capital flows from major deficit countries. A better understanding of the external adjustment mechanism inside a monetary union warrants further research. More generally, we find that in countries with exchange rate pegs the turnaround in the current account is more strongly related to the initial current account gap than in other countries, and that it took place primarily through a dramatic shift in other investment flows, which include most banking

flows.

Finally, the high output costs that have been associated with rapidly correcting a large current account deficit during this episode provide additional empirical support for research that assesses whether current account deficits during good times might partly reflect distortions that fail to internalize the risk of a subsequent sudden stop. In turn, the design of optimal policy interventions in such cases is a further item for the future research agenda.

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Appendix. Country sample

country	Peg	Advanced	country	Peg	Advanced
Argentina	0	0	Latvia	1	0
Australia	0	1	Lebanon	1	0
Austria	1	1	Lithuania	1	0
Belarus	1	0	Luxembourg	1	1
Belgium	1	1	Malaysia	0	0
Brazil	0	0	Mexico	0	0
Bulgaria	1	0	Morocco	0	0
Canada	0	1	Netherlands	1	1
Chile	0	0	New Zealand	0	1
China,P.R.: Mainland	0	0	Norway	0	1
China,P.R.:Hong Kong	1	1	Pakistan	0	0
Colombia	0	0	Peru	0	0
Costa Rica	0	0	Philippines	0	0
Croatia	1	0	Poland	0	0
Cyprus	1	1	Portugal	1	1
Czech Republic	0	0	Romania	0	0
Denmark	1	1	Russian Federation	0	0
Dominican Republic	0	0	Serbia, Republic of	0	0
El Salvador	1	0	Singapore	0	1
Estonia	1	0	Slovak Republic	1	0
Finland	1	1	Slovenia	1	0
France	1	1	South Africa	0	0
Germany	1	1	Spain	1	1
Greece	1	1	Sri Lanka	0	0
Guatemala	0	0	Sweden	0	1
Hungary	0	0	Switzerland	0	1
Iceland	0	1	Taiwan	1	0
India	0	0	Thailand	0	0
Indonesia	0	0	Tunisia	0	0
Ireland	1	1	Turkey	0	0
Israel	0	1	Ukraine	0	0
Italy	1	1	United Kingdom	0	1
Japan	0	1	United States	0	1
Korea, Republic of	0	0	Uruguay	0	0

Notes: “peg” refers to de facto exchange rate regime classification for the period 2005-08.

Table 1. Drivers of Current Account Balance, 1969-2008

	(1) ALL	(2) ADV	(3) EM	(4) ALL	(5) ADV	(6) EM
Fiscal balance	0.243***	0.273***	0.266**	0.244***	0.274***	0.275**
	(0.06)	(0.04)	(0.11)	(0.06)	(0.07)	(0.11)
Growth differential	-0.0724	0.32	-0.183*	-0.0809	0.306	-0.202**
	(0.09)	(0.27)	(0.09)	(0.09)	(0.27)	(0.09)
Dependency ratio	-0.150**	0.123	-0.303***	-0.155**	0.126	-0.316***
	(0.06)	(0.14)	(0.10)	(0.07)	(0.15)	(0.10)
Population growth	-0.743	0.297	-1.421**	-0.751	0.261	-1.514***
	(0.47)	(0.96)	(0.60)	(0.48)	(0.98)	(0.55)
Aging speed	0.056	0.222**	-0.142	0.046	0.222*	-0.158*
	(0.06)	(0.11)	(0.09)	(0.06)	(0.12)	(0.09)
Relative GDP per capita	0.0272*	0.0126	0.0432	0.0283*	-0.00528	0.041
	(0.01)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Lagged NFA	0.049***	0.046***	0.050***	0.050***	0.047***	0.049***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Crisis dummy	0.0178**	0.00403	0.0147*	0.0175**	0.00217	0.0138*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial center dummy	0.014	0.022		0.013	0.020	
	(0.01)	(0.01)		(0.01)	(0.01)	
Asian crisis dummy	0.037***	0.0202	0.0338**	0.0351**	0.0217	0.0319**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Oil balance	0.239***	0.262***	0.214**	0.239***	0.280***	0.232**
	(0.06)	(0.08)	(0.10)	(0.06)	(0.09)	(0.09)
Oil balance Norway	0.14	0.14		0.171	0.21	
	(0.11)	(0.14)		(0.13)	(0.25)	
Log terms of trade				0.0107	0.0141	0.0161*
				(0.01)	(0.04)	(0.01)
Constant	0.00743	0.002	0.00387	-0.0412	-0.0671	-0.0724
	(0.01)	(0.01)	(0.02)	(0.05)	(0.21)	(0.05)
Observations	503	234	269	496	227	269
R^2	0.45	0.60	0.29	0.44	0.60	0.30

Note: Panel estimation, 4-year averages. *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Table 2. Current Account Adjustment, 2010 vs 2005-08

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample→	All	No Peg	Peg	All	No Peg excl ICE	Peg excl Baltics	All excl ICE, Baltics
CA gap	-0.63***	-0.46***	-0.95***	-0.46***	-0.31***	-0.70**	-0.31***
	[0.135]	[0.143]	[0.184]	[0.145]	[0.094]	[0.286]	[0.095]
CA gap*peg				-0.49**			-0.39
				[0.232]			[0.294]
NFA/GDP 2004-07	-0.01*	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
	[0.008]	[0.010]	[0.011]	[0.010]	[0.010]	[0.011]	[0.010]
NFA * peg				-0.01			0.00
				[0.015]			[0.015]
Peg				0.00			0.00
				[0.012]			[0.011]
constant	0.01**	0.01	0.01	0.01	0.00	0.00	0.00
	[0.005]	[0.005]	[0.011]	[0.005]	[0.005]	[0.010]	[0.005]
N	66	42	24	66	41	21	62
R^2	0.46	0.47	0.51	0.52	0.28	0.40	0.36

Note: *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Table 3. Real Exchange Rate Adjustment, 2010 vs 2007

	(1)	(2)	(3)	(6)	(4)	(5)	(7)
Sample→	All	No Peg	Peg	All	No Peg excl ICE	Peg excl Baltics	All excl ICE, Baltics
CA gap	0.44	0.81*	-0.55***	0.81*	0.28	-0.44***	0.28
	[0.376]	[0.474]	[0.109]	[0.479]	[0.303]	[0.131]	[0.307]
CA gap*peg				-1.36***			-0.72**
				[0.491]			[0.333]
NFA/GDP 2004-07	0.00	0.04*	-0.03*	0.04*	0.03**	-0.03*	0.03**
	[0.017]	[0.021]	[0.017]	[0.022]	[0.016]	[0.017]	[0.017]
NFA * peg				-0.07**			-0.06***
				[0.027]			[0.024]
Peg				-0.04*			-0.06**
				[0.023]			[0.022]
constant	0.02	0.03	-0.01	0.03	0.04**	-0.02	0.04**
	[0.014]	[0.020]	[0.011]	[0.020]	[0.018]	[0.012]	[0.018]
N	66	42	24	66	41	21	62
R^2	0.05	0.20	0.44	0.24	0.06	0.34	0.15

Note: The dependent variable is the percentage change in the real effective exchange rate between 2005-08 and 2010. *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Table 4. Domestic Demand Adjustment, 2007-10

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample→	All	No Peg	Peg	All	No Peg excl ICE	Peg excl Baltics	All excl ICE, Baltics
CA gap	1.45***	1.17***	0.81**	1.50**	0.81**	1.17***	0.81**
	[0.311]	[0.393]	[0.319]	[0.646]	[0.366]	[0.397]	[0.323]
CA gap *peg						0.33	0
						[0.748]	[0.481]
NFA/GDP 2004-07	0.02*	0.01	0.01	0.04	0.02	0.01	0.01
	[0.014]	[0.020]	[0.022]	[0.026]	[0.025]	[0.021]	[0.023]
NFA/GDP* peg						0.02	0.01
						[0.032]	[0.033]
Peg						-0.08***	-0.07***
						[0.026]	[0.024]
Constant	0.02	0.05***	0.06***	-0.03	-0.01	0.05***	0.06***
	[0.013]	[0.014]	[0.013]	[0.022]	[0.021]	[0.014]	[0.013]
N	66	42	41	24	21	66	62
R^2	0.36	0.34	0.17	0.34	0.18	0.45	0.30

Note: Dependent variable is the change in total domestic demand between 2007 and 2010. CA gap is the difference between actual and fitted value for the CA to GDP ratio, 2005-08. *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Table 5. Output Adjustment, 2007-2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample→	All	No Peg	Peg	All	No Peg excl ICE	Peg excl Baltics	All excl ICE, Baltics
CA gap	0.83***	0.68***	0.74	0.68***	0.62**	0.3	0.62**
	[0.226]	[0.205]	[0.579]	[0.207]	[0.249]	[0.425]	[0.252]
CA gap *peg				0.06			-0.31
				[0.605]			[0.485]
NFA/GDP 2004-07	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	[0.013]	[0.018]	[0.027]	[0.018]	[0.018]	[0.028]	[0.019]
NFA/GDP* peg				0.02			0.01
				[0.032]			[0.033]
Peg				-			
				0.06***			-0.05**
				[0.020]			[0.021]
Constant	0.04***	0.06***	0.00	0.06***	0.06***	0.01	0.06***
	[0.010]	[0.011]	[0.017]	[0.011]	[0.011]	[0.018]	[0.011]
N	66	42	24	66	41	21	62
R^2	0.23	0.20	0.18	0.33	0.13	0.04	0.21

Note: Dependent variable is the change in real GDP between 2007 and 2010. CA gap is the difference between actual and fitted value for the CA to GDP ratio, 2005-08. *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Table 6. Current Account Quartiles and Macroeconomic Adjustment

Panel A: Change in Real Exchange Rate (2010 vs 2007)

Quartiles ↓	All			Peg			Non Peg		
	Obs	Mean	Median	Obs	Mean	Median	Obs	Mean	Median
Top	17	0	0.02	7	-0.03	0.03	10	0.01	0.01
Middle	32	0.02	0.01	14	0	-0.01	18	0.04	0.05
Bottom	17	0.03	0.01	4	0.01	-0.01	13	0.03	0.02
Full Sample	66	0.02	0.01	25	-0.01	0	41	0.03	0.03

Panel B: Change in Domestic Demand (2010 vs 2007)

Quartiles ↓	All			Peg			Non Peg		
	Obs	Mean	Median	Obs	Mean	Median	Obs	Mean	Median
Top	17	-0.13	-0.09	7	-0.21	-0.25	10	-0.07	-0.05
Middle	32	0.02	0.01	14	0.02	-0.01	18	0.03	0.04
Bottom	17	0.14	0.15	4	0.23	0.22	13	0.12	0.15
Full Sample	66	0.02	0.02	25	-0.01	-0.01	41	0.03	0.04

Panel C: Change in Real Output (2010 vs 2007)

Quartiles ↓	All			Peg			Non Peg		
	Obs	Mean	Median	Obs	Mean	Median	Obs	Mean	Median
Top	17	-0.04	-0.03	7	-0.08	-0.09	10	-0.01	0
Middle	32	0.03	0	14	0.02	0	18	0.04	0.05
Bottom	17	0.12	0.13	4	0.21	0.2	13	0.09	0.11
Full Sample	66	0.04	0.02	25	0.02	0	41	0.04	0.05

Note: In the 'Top Quartile' the current account exceeds 3 percent of GDP. In the two 'Middle Quartiles' the current account lies between -1.96 and 3 percent of GDP. In the 'Bottom Quartile' the current account is less than -1.96 percent of GDP. n denotes the number of observations.

Table 7. Current Account Quartiles and Capital Flow Adjustment

	Panel A: Other Investment				Panel B: Portfolio Investment			
Quartiles ↓	Mean	Median	25	75	Mean	Median	25	75
Top	-8.2%	-7.0%	-18.9%	-0.9%	1.6%	0.5%	-1.7%	3.6%
Middle	0.5%	0.0%	-2.6%	4.2%	0.4%	0.8%	-1.4%	4.8%
Bottom	2.3%	0.6%	-3.0%	4.8%	-0.5%	0.1%	-0.6%	1.3%
Full Sample	-1.2%	-1.0%	-6.1%	2.8%	0.5%	0.4%	-1.1%	2.8%
	Panel C: FDI				**Panel D: Reserves**			
Quartiles ↓	Mean	Median	25	75	Mean	Median	25	75
Top	-3.6%	-2.4%	-4.7%	0.3%	-0.3%	0.5%	-0.2%	3.3%
Middle	-0.7%	-0.3%	-1.6%	1.4%	-0.7%	-0.3%	-1.2%	0.3%
Bottom	-0.4%	-0.2%	-1.9%	0.6%	1.2%	1.6%	-0.5%	4.0%
Full Sample	-1.3%	-0.4%	-2.3%	0.8%	-0.1%	0.0%	-0.8%	2.0%

Note: Capital flow cells report the change in net capital flows (net inflows minus net outflows) between 2007 and 2010, as a ratio of 2007 GDP. Net increases in capital inflows have a positive sign, and net reductions a negative sign. The '*Top Quartile*' contains observations with a current account improvement exceeding 3 percent of GDP. The two '*Middle Quartiles*' contain observations with a current account adjustment lying between -1.96 and 3 percent of GDP. The '*Bottom Quartile*' contains observations with a current account decline of greater than 1.96 percent of GDP.

Table 8. Current account gap and capital flow adjustment: peg vs float

	Large negative CA gap 2005-08 (< -2% of GDP)	Large positive CA gap 2005-08 (> 2% of GDP)	Large negative CA gap 2005-08 (< -2% of GDP)	Large positive CA gap 2005-08 (> 2% of GDP)
exchange rate regime	Peg		Float	
Current account gap 2005-08	-5.0%	4.4%	-4.5%	5.2%
Current account balance, 2010 vs 2005-08	5.3%	-0.7%	2.6%	-1.5%
Change in net other inv. flows, 2007-2010	-2.2%	-2.7%	-1.7%	-0.2%
Change in net direct inv. flows, 2007-2010	-6.1%	8.3%	-3.2%	0.8%
Change in net portf. inv. flows, 2007-2010	-1.7%	-3.0%	0.5%	0.2%
Change in FX reserve flows, 2007-2010	2.6%	-2.2%	0.8%	0.0%
Number of observations	13	5	9	20

Table 9. External Adjustment and the Euro

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Change in CA		Change in REER		Change in dom. Demand		Change in GDP	
	All	Peg	All	Peg	All	Peg	All	Peg
CA gap	-0.66***	-1.18***	0.41	-0.69***	1.49***	1.87*	0.87***	1.16
	[0.14]	[0.17]	[0.38]	[0.10]	[0.35]	[1.07]	[0.25]	[0.94]
NFA/GDP 2004-07	-0.02*	-0.02**	-0.01	-0.04***	0.03*	0.05	0.00	0.02
	[0.01]	[0.01]	[0.02]	[0.01]	[0.01]	[0.03]	[0.01]	[0.03]
euro	-0.00	-0.00	-0.04**	0.00	-0.08**	-0.04	-0.08***	-0.06
	[0.01]	[0.02]	[0.02]	[0.02]	[0.04]	[0.06]	[0.02]	[0.04]
CA gap * euro	0.23	0.75***	-0.48	0.63*	-0.31	-0.68	-0.45	-0.74
	[0.17]	[0.20]	[0.46]	[0.31]	[0.79]	[1.33]	[0.45]	[1.02]
NFA * euro	0.03**	0.04**	-0.05	-0.02	-0.06	-0.09	-0.03	-0.04
	[0.01]	[0.02]	[0.05]	[0.05]	[0.08]	[0.09]	[0.05]	[0.05]
Constant	0.01**	0.01	0.03*	-0.01	0.03**	-0.01	0.05***	0.03
	[0.01]	[0.02]	[0.01]	[0.01]	[0.02]	[0.05]	[0.01]	[0.04]
Observations	66	24	66	24	66	24	66	24
R-squared	0.48	0.63	0.07	0.50	0.41	0.38	0.32	0.27

Note: Dependent variable is the change in the variable in the first row between 2007 and 2010. CA gap is the difference between actual and fitted value for the CA to GDP ratio, 2005-08. *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Table 10. Net Capital Flows Via Central Banks

	2005-2007	2010
Greece	-0.1	22.0
Portugal	-0.3	16.9
Spain	-0.5	2.3
Ireland	-1.0	53.6

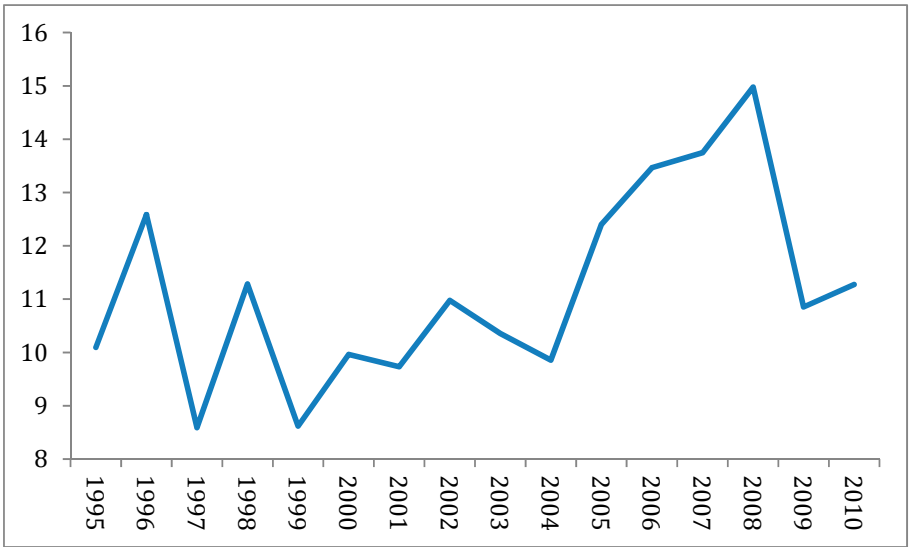
Note: Ratios to GDP. Calculated from IMF's Balance of Payments Dataset and External Debt statistics for Ireland.

Table 11. Current account adjustment, external finance and current account gap

	(1)	(2)	(3)	(4)	(5)
	ALL	Non-peg	Non-peg excl. Iceland	Peg	Peg excluding Latvia
Current account gap, 2005-08	-0.66***	-0.35***	-0.25**	-1.14***	-1.00***
	[0.15]	[0.12]	[0.10]	[0.19]	[0.13]
NFA to GDP, 2004-2007	-0.01*	-0.01	-0.01	-0.02**	-0.02**
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Official external finance dummy	-0.01	0.04**	0.03**	-0.07*	-0.08***
	[0.02]	[0.02]	[0.02]	[0.03]	[0.03]
Constant	0.01**	0.00	0.00	0.02**	0.02***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Observations	66	42	41	24	23
R-squared	0.465	0.549	0.356	0.64	0.694

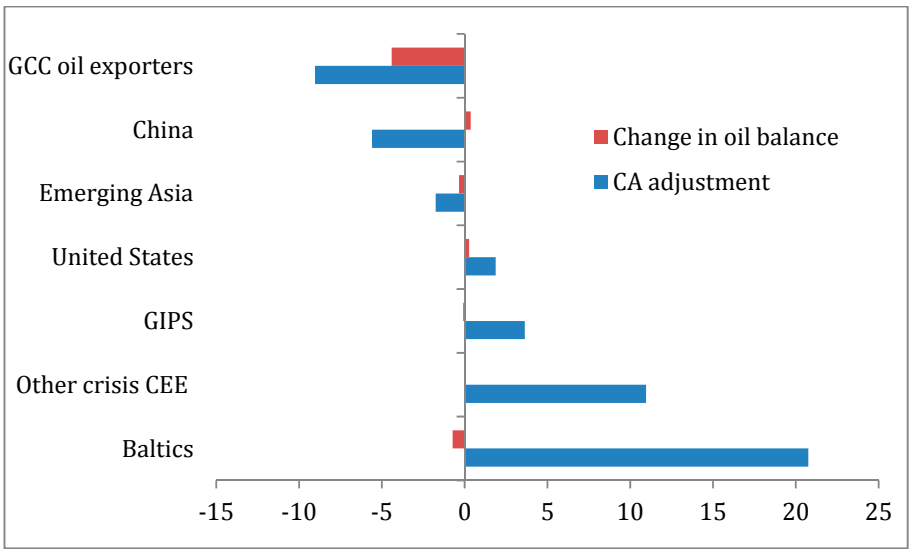
Note: Dependent variable is the change in the current account balance/GDP ratio between 2005-08 and 2010. The current account gap is the difference between actual and fitted value for the CA to GDP ratio, 2005-08. The "official external finance dummy" takes the value of 1 for countries receiving net external official finance during the 2008-2010 period in the form of IMF loans, EU loans, or ECB liquidity provision to banks. The countries are Belarus, Greece, Hungary, Iceland, Ireland, Latvia, Portugal, Serbia, Romania, Spain, and Ukraine. *,**, *** denote significance at 10, 5 and 1 percent levels respectively. OLS estimation with robust standard errors.

Figure 1. Standard Deviation of Current Account Balances



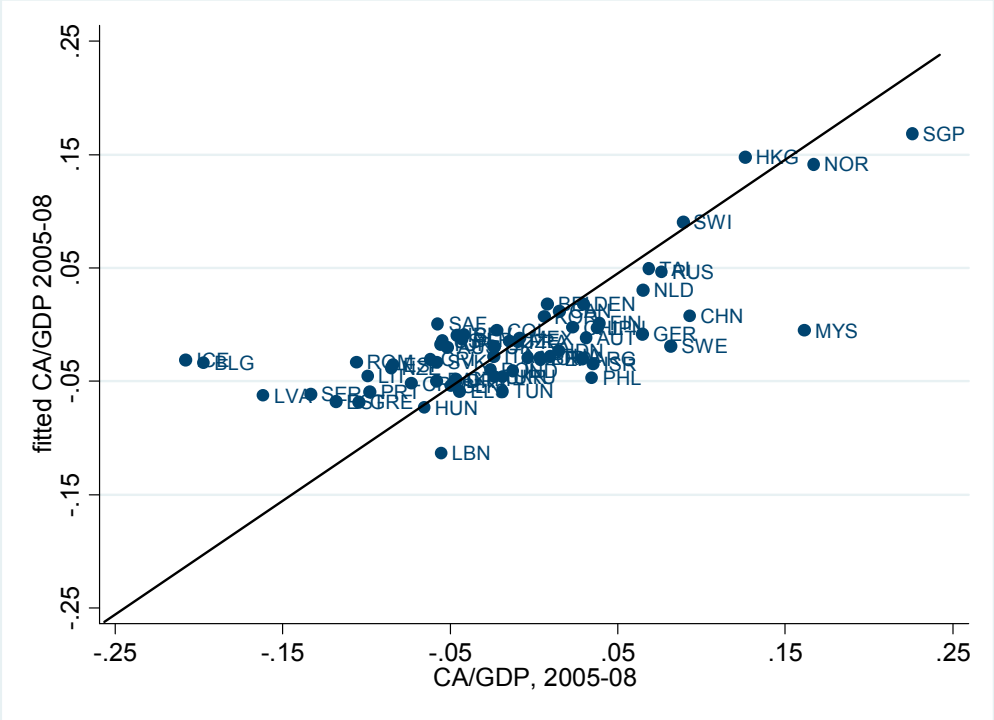
Note: Cross-country standard deviation of current account balances (ratios to GDP). 173 country sample, based on IMF's World Economic Outlook database.

Figure 2. Change in current account/GDP ratio, 2007-2010



GIPS: Greece, Ireland, Portugal, and Spain (simple average)
Other crisis CEE: Bulgaria, Hungary, Romania, Serbia, Ukraine (simple average)
Emerging Asia: Hong Kong, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand (simple average).

Figure 3. Actual Current Account Balance and Fitted Current Account Balance, 2005-2008



Note: Scatter of actual current account balance against fitted current account balance (average ratios to GDP, 2005-2008). Fitted values based on regression reported in column (1) of Table 1.

Figure 4. Change in Current Account Balance against Current Account Gap

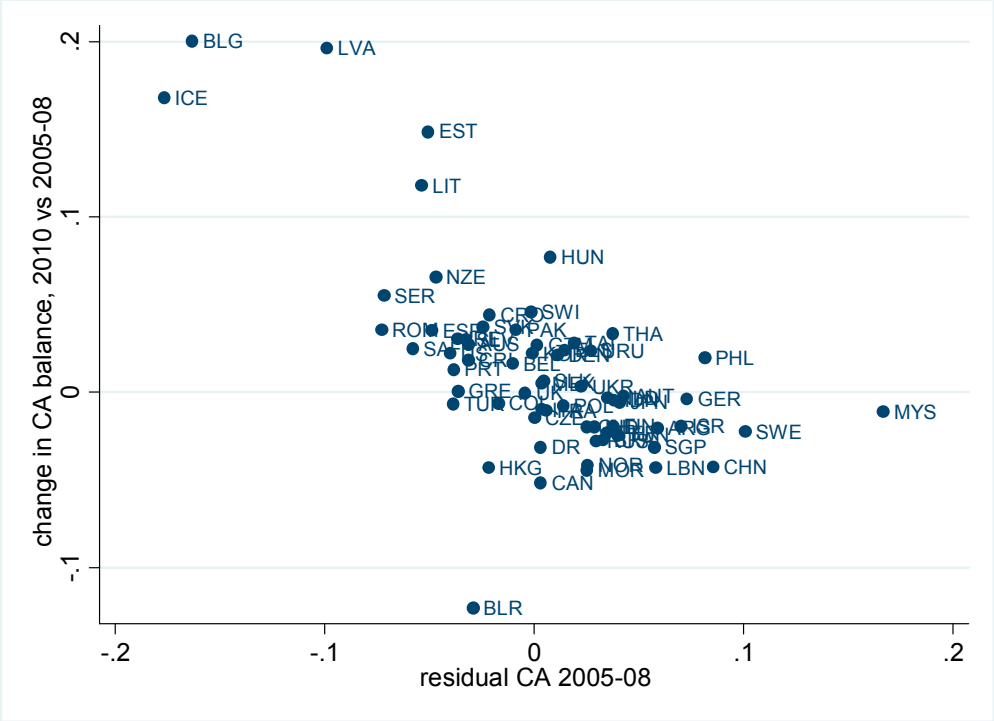
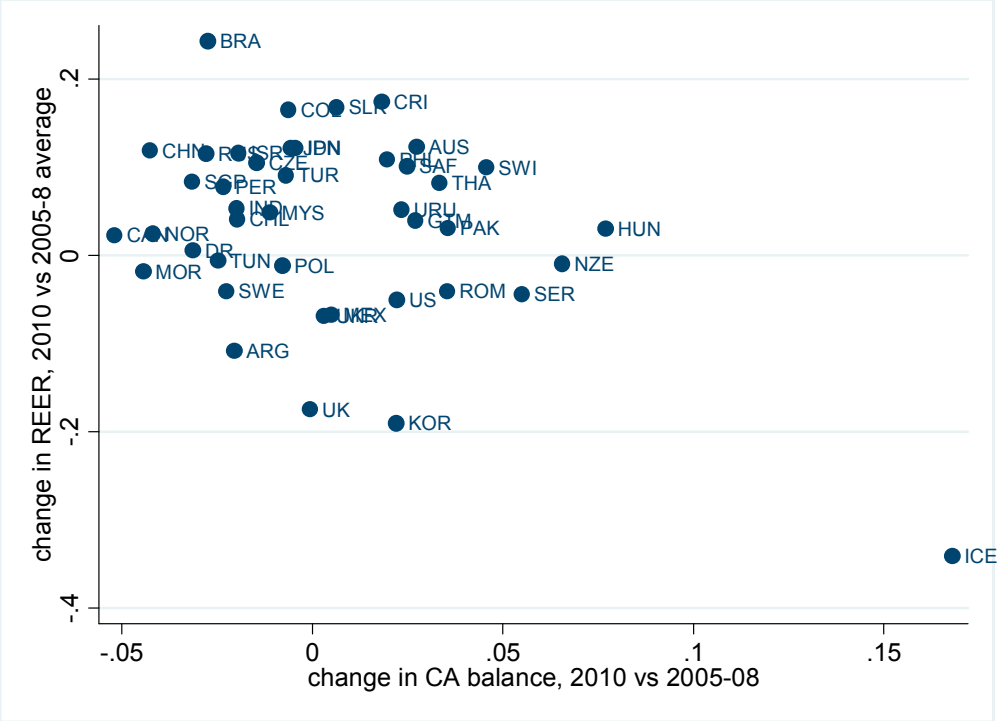


Figure 5. Change in current account/GDP and change in real exchange rates, 2008-2010

A. floating



B. fixed

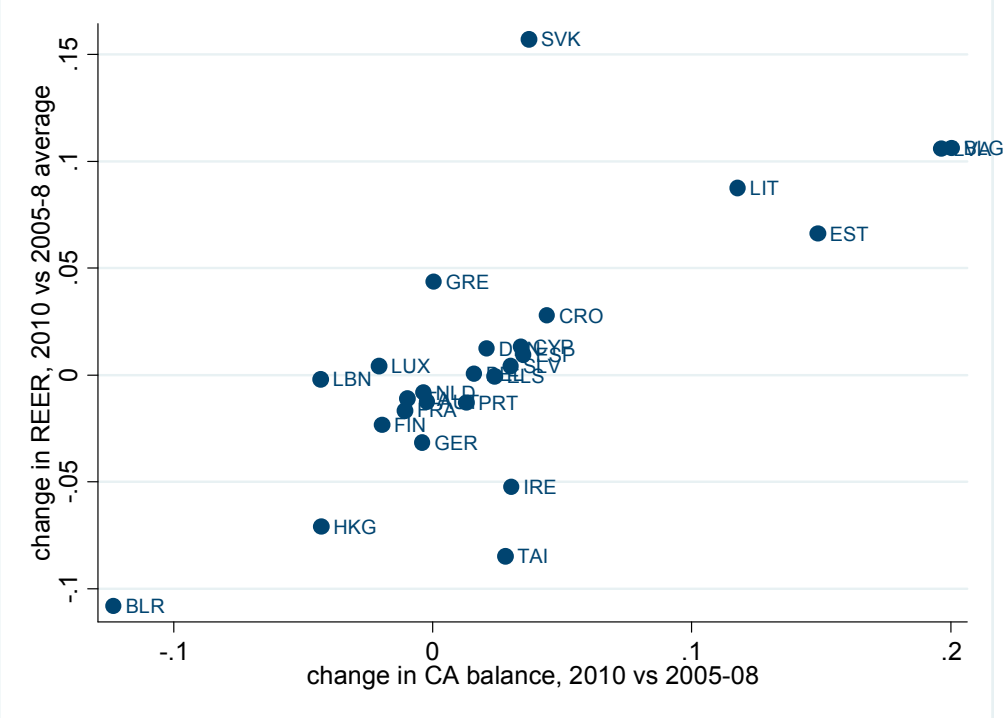


Figure 6. Change in current account/GDP and change in relative domestic demand, 2007-2010

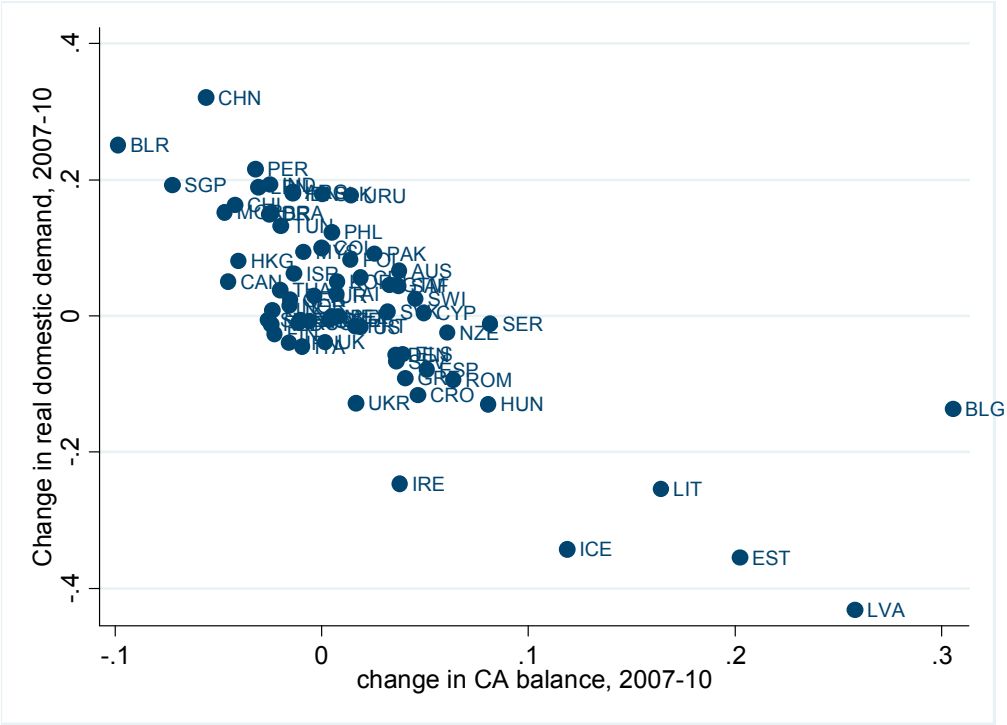


Figure 7. Change in current account/GDP and change in relative output, 2007-2010