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CURRENT ACCOUNT REVERSALS IN INDUSTRIAL COUNTRIES

DOES THE EXCHANGE RATE REGIME MATTER?

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In 2013 all ECB publications feature a motif taken from the €5 banknote.

Abstract

This paper studies current account reversals in industrial countries across different exchange rate regimes. There are two major findings which have important implications for industrial economies with external imbalances: first, triggers of current account reversals differ between exchange rate regimes. While the current account deficit and the output gap are significant predictors of reversals across all regimes, reserve coverage, credit booms, openness to trade and the US short term interest rate determine the likelihood of reversals only under more rigid regimes. Conversely, the real exchange rate affects the probability of experiencing a reversal only under flexible arrangements. Second, current account reversals in advanced economies do not have an independent effect on growth. This result holds not only for industrial economies in general but also for countries with fixed exchange rate regimes in particular.

Non-Technical Summary

Sharp external adjustments that lead to a sustained current account improvement are commonly referred to as current account reversals. Reversals have been analyzed intensively in the literature, typically with a focus on the channels through which they are achieved as well as on the question whether they have implications for real economic performance. However, one aspect that has received only limited attention is the relationship between current account reversals and exchange rate regimes, an aspect that is especially timely with regard to the existing external imbalances within the Euro area. The present paper contributes to this strand of the literature by presenting a systematic analysis of current account reversals across different de-facto exchange rate regimes in industrial countries. In particular, it examines whether current account reversals follow different patterns depending on the exchange rate regime in place. Moreover, it identifies triggers of reversals and examines the link between reversals and growth across different exchange rate regimes. The analysis focuses precisely on distinguishing rigid exchange rate regimes from those that are more flexible when identifying triggers of reversals and when analyzing the link between reversals and growth.

The paper proceeds as follows: we initially identify 43 episodes of current account reversals in 22 industrial economies between 1970 and 2007. The episodes are then grouped by types of de-facto exchange rate regime. In particular, we distinguish three groups of exchange rate regimes: fixed exchange rate regime, intermediate exchange rate regime and flexible exchange rate regime. Then, a brief event study examining the average patterns of some key macroeconomic variables before and after the reversal sets the stage for the empirical analysis which is split into two parts. In the first part, we estimate a Probit model for the sample as a whole and, separately, for each of the groups of exchange rate regimes in an effort to identify predictors of current account reversals. We find that larger deficits and larger output gaps are associated with a higher probability of experiencing reversals across all exchange rate regimes. Conversely, lower reserves growth, higher domestic credit growth, higher US interest rates and a more closed economy raise the probability of a reversal only under less flexible exchange rate regimes. A real exchange rate depreciation, on the other hand, is a significant trigger only under flexible regimes. In the second part of the study, we estimate a treatment effects model to test whether sharp current account corrections negatively affect growth both for the sample as a whole and, separately, for different types of exchange rate regimes. In anticipation of our results, we find no evidence in favor of this hypothesis, neither for the sample as a whole nor for the subsample of fixed exchange rate regimes.

1 Introduction

The years preceding the global crisis saw large and persistent current account imbalances which peaked at some three percent of global GDP in 2006 (IMF 2012a). Commentators focused primarily on the US deficit, but many other advanced economies including Australia, Greece, Ireland, New Zealand, Portugal and Spain recorded large and persistent external deficits at that time. After the outbreak of the financial crisis, several world economies experienced sizable current account corrections, yet the intense debate among academics and policy-makers about the nature and the sustainability of global current account imbalances continues (Feldstein 2008; Obstfeld 2012; Serven and Nguyen 2010)[1]. While external positions can often be explained by economic fundamentals such as demographics or expectations of productivity growth, the pronounced imbalances recorded prior to the crisis reflected at least in part structural distortions such as unsustainable expansionary fiscal policies and asset booms in major advanced economies. The perceived sustainability of these deficits determines whether and how long they can be maintained and financed. Indeed, a current account deficit investors are no longer willing to finance will be forced to reverse partly or fully, often within a short period of time (Blanchard and Milesi Ferretti 2010; IMF 2012a).

Sharp external adjustments that lead to a sustained current account improvement are commonly referred to as current account reversals. Reversals have been analyzed intensively in the literature, typically with a focus on the channels through which they are achieved as well as on the question whether they have implications for real economic performance. However, one aspect that has received only limited attention in the literature is the relationship between current account reversals and exchange rate regimes, an aspect that is especially timely with regard to the existing external imbalances within the Euro area. To our knowledge only Edwards (2004a), Edwards (2004b), De Haan, Schokker and Tcherneva (2008), Gosh, Terrones and Zettelmeyer (2010), Chinn and Wei (2013) and Lane and Milesi-Ferretti (2012) have dealt with this important topic[2]. The present paper contributes to this strand of the literature by presenting a systematic analysis of current account reversals across different de-facto exchange rate regimes. In particular, it examines whether current account reversals in industrial economies follow different patterns depending on the exchange rate regime in place. Moreover, it identifies triggers of reversals and examines the link between reversals and growth across different exchange rate regimes.

Milesi-Ferretti and Razin (2000) is one of the first among a growing number of studies that

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[1]In 2008, current account deficits amounted to 4.4% of GDP in Australia, 14.9% in Greece, 5.7% in Ireland, 8.8% in New Zealand, 12.6% in Portugal, 9.6% in Spain and 4.7% in the US. These are largely unprecedented among industrial countries. In 2011, as a percentage of GDP, the current account deficit reached 2.3% in Australia, 9.8% in Greece, -1.1% in Ireland, 4.2% in New Zealand, 6.4% in Portugal, 3.5% in Spain and 3.1% in the US (IMF 2012b).

[2]Chinn and Wei (2013) assess whether 'The Case for Flexible Exchange Rates' made by Friedman in 1953 is supported by any empirical evidence. Indeed, they systematically study the relationship between de-facto exchange rate regimes and the speed of current account reversion. Lane and Milesi-Ferretti (2012) examine the process of adjustment of external imbalances between 2008 and 2010 considering both a large sample of countries and 2 sub-samples defined according to the countries' de-facto exchange rate regimes.

explicitly analyzes the triggers and patterns of current account reversals. The authors use a large panel of developing countries to identify determinants of current account reversals. The evidence suggests that the current account balance itself, a country's openness to trade, its terms of trade and reserve coverage as well as growth in industrial economies and US interest rates are drivers of current account reversals in developing economies. Moreover, conducting a before-after analysis, they do not find any evidence of a systematic relationship between current account corrections and economic performance.

Freund (2005) was the first to systematically examine current account reversals in industrial economies. Studying the patterns of macroeconomic variables during reversal episodes, she finds that reversals in industrial economies are generally accompanied by a depreciation of the real exchange rate, a decline in GDP growth, investment and imports, and a rise in exports. The current account deficit takes between 3 and 4 years to resolve. Moreover, Freund (2005) shows that a larger current account deficit and weakening growth are significant predictors of reversals. However, she does not condition the triggers of reversals directly on the exchange rate regime in place. De Haan et al. (2008) is the only study we are aware of that does take the role of exchange rate regimes into account when analyzing triggers of current account reversals in advanced economies. The authors find that, under a peg and a moving band, a deeper current account deficit has less predictive power of current account reversals than under a crawling peg. Conversely, a larger output gap has a lower predictive power under a moving band than under a crawling peg. The authors do not, however, systematically distinguish groups of countries with different exchange rate regimes as we do in this paper.

Croke, Kamin and Leduc (2006) study the link between current account reversals and economic growth in industrial economies. Their work tests the so called "disorderly correction hypothesis" which claims that current account reversals lead to a disruptive adjustment process that translates into a decline in growth. While some current account reversals indeed coincide with growth declines, the authors do not find any supportive evidence for a causal link between the reversal itself and the fall in growth. Debelle and Galati (2007) come to the same conclusion.[3] However, the inability of these studies to identify a link between reversals and growth may be due to the fact that they do not distinguish countries with fixed from those with more flexible exchange rate regimes.

Indeed, Friedman (1953) already pointed out that flexible exchange rates allow a more orderly adjustment process by functioning as external shock absorbers, i.e. by providing a device for continuous adjustment and guaranteeing full autonomy to domestic policy in the achievement of its targets. However, Chinn and Wei (2013) study the relationship between the exchange rate regimes and the speed of current account adjustment and do not find any evidence supporting the hypothesis that the current account reversion to its long run equilibrium is faster

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[3]Debelle and Galati (2007) analyze the behavior and the role of financial flows and their composition during reversals in industrial countries. Their results show that the more volatile types of flows, which are more strongly affected by changes in interest rates, are those that adjust the most. However, the dynamics of financial flows do not change significantly before a current account adjustment and their role in triggering a reversal does not seem to be relevant.

under flexible exchange rate regimes. This result suggests that current account imbalances are not more persistent under fixed exchange rates. Indeed, in principle, fixing the nominal exchange rate does not necessarily limit the ability of the real exchange rate to adjust, given sufficient flexibility in prices and costs. However, in practice, both prices and wages are relatively sticky compared to the nominal exchange rate. Thus, a fixed exchange rate regime may imply that most of the adjustment burden has to be borne by changes in economic activity, potentially leading to a more pronounced slowdown. Indeed, Edwards (2004a) and Edwards (2004b) find in a sample of mainly developing economies that current account reversals lead to lower GDP growth only under hard pegged and intermediate exchange rate systems.

The analysis in the present paper focuses precisely on distinguishing rigid exchange rate regimes from those that are more flexible when identifying triggers of reversals and when analyzing the link between reversals and growth. The paper proceeds as follows: we initially identify 43 episodes of current account reversals in 22 industrial economies between 1970 and 2007. The episodes are then grouped by exchange rate regime using the de-facto classification by Ilzetzki, Reinhart and Rogoff (2008)[4][5]. In particular, as in Chinn and Wei (2013), we distinguish three groups of exchange rate regimes: fixed exchange rate regime, intermediate exchange rate regime and flexible exchange rate regime. Then, a brief event study examining the average patterns of some key macroeconomic variables before and after the reversal sets the stage for the empirical analysis which is split into two parts. In the first part, we estimate a Probit model for the sample as a whole and, separately, for each of the groups of exchange rate regimes in an effort to identify predictors of current account reversals. We find that larger deficits and larger output gaps are associated with a higher probability of experiencing reversals across all exchange rate regimes. Conversely, lower reserves growth, higher domestic credit growth, higher US interest rates and a more closed economy raise the probability of a reversal only under less flexible exchange rate regimes. A real exchange rate depreciation, on the other hand, is a significant trigger only under flexible regimes. In the second part of the study, we estimate a treatment effects model to test whether sharp current account corrections negatively affect growth both for the sample as a whole and, separately, for different types of exchange rate regimes. In anticipation of our results, we find no evidence in favor of this hypothesis, neither for the sample as a whole nor for the subsample of fixed exchange rate regimes.

The remainder of this paper is structured as follows: Section 2 outlines our identification strategy for current account reversals and discusses the dynamics of key macroeconomic variables before and after the reversal. Section 3 presents our findings as regards the triggers of current account reversals while Section 4 discusses the treatment effects model and our findings related to the link between reversals and growth. Section 5 presents a battery of robustness checks, and Section 6 concludes.

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[4]Ilzetzki et al. (2008) provide updates to the de-facto exchange rate regime classification originally suggested by Reinhart and Rogoff (2004).

[5]Following Edwards (2004a), Edwards (2004b), a given country is assigned the exchange rate regime in place four quarters before the reversal starts. This strategy aims at addressing the effects of a potential regime switch on the results of the analysis

2 The dynamics of the current account adjustments: data and event study

The analysis uses quarterly data from 1970 to 2007 for a sample of 22 industrial economies[6]. Whenever quarterly data are not available for a given variable, we use annual data interpolated to quarterly frequency.[7] Episodes of current account reversals are identified using criteria similar to those used in Algieri and Bracke (2011). The intention behind these criteria is to ensure that episodes are only classified as reversals if periods of current account deficits are followed by sustained improvements in current accounts. Specifically, an episode qualifies as a reversal if the following 4 conditions are satisfied:

1. The current account is negative when the reversal starts.[8]

2. The annual average of the current account to GDP ratio improves by at least 1 standard deviation by the third year after the reversal started.[9]

3. The maximum current account deficit in the 5 years after the reversal started is smaller than the initial one.

4. There is no current account reversal in the 3 years before the reversal starts.

We identify 43 episodes of current account reversals based on these criteria. As can be seen in Table A.6, most of the reversals occurred in the 1980s and in the 1990s, respectively 20 and 14 episodes. Only 6 reversals took place in the 1970s, a period of relatively limited financial market and trade integration in advanced economies. Only 3 reversals have taken place since 2000[10]. Figures A.2 and A.3 illustrate the incidence of current account reversals by country and over time.

We group reversal episodes according to the de-facto exchange rate regime in place four quarters before the reversal begins. This strategy allows addressing possible effects of regime switches on the estimation results (Edwards 2004a,b)[11]. Following Chinn and Wei (2013), we define three groups of exchange rate regimes: the fixed exchange rate regime corresponds to the first 4 categories of the fine grid in Reinhart and Rogoff (2004) and ranges from "no legal

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[6]A list of the countries in the sample is reported in Table A.1. Table A.2 shows a detailed description of the variables we use as well as their sources.

[7]We used a linear interpolation method as part of which the last observation was matched to the source data.

[8]As Algieri and Bracke (2011) and IMF (2007) highlight, this criterion allows for a larger sample size compared to approaches that require the initial current account deficit to exceed a given magnitude. In a robustness check, we restrict the sample to reversals with an initial deficit larger than 2% of GDP as in Freund (2005) and find that our main results are qualitatively unchanged.

[9]As in Algieri and Bracke (2011), we use the country specific standard deviation rather than a fixed threshold in order to take account of country heterogeneity in current account dynamics. The highest current account standard deviation is in Norway (7.8%) while the lowest in France (1.2%)

[10]Based on the criteria used to identify reversals, the last year in which an episode could have taken place in our sample is 2002.

[11]There are only 2 cases of reversal episodes in which regime switches took place during the four quarters leading up to the starting point of the reversal. These are the reversals in Greece 1985q3 and Greece 1990q1.

tender" to "de facto peg"; the intermediate exchange rate regime includes the categories 5 to 11 and ranges from "pre-announced crawling band that is narrower than or equal to +/-2%" to "noncrawling band that is narrower than or equal to +/-2%"; finally, the flexible exchange rate regime comprises categories 12 and 13 and comprises "managed floating" and "freely floating".[12] Observations that correspond to a "freely falling" de-facto regime are dropped[13]. Figures A.4 and A.5 show countries' de-facto exchange rate regimes, as well as how these changed over time. We find that, of the 43 episodes in our sample, 7 took place under fixed exchange rate regimes[14], 22 under intermediate exchange rate regimes and 14 under flexible exchange rates. Therefore, current account reversals occurred with the highest likelihood under the intermediate exchange rate regimes and with the lowest probability under fixed exchange rate regimes. Table A.6 reports the distribution over time of the de-facto exchange rate regime observations in the sample and shows that the intermediate exchange rate regime observations are the most represented category in the sample while flexible exchange rate regimes are least represented.

Figure 1 illustrates the average patterns of key macroeconomic variables including the current account as % of GDP, economic growth, the output gap as % of potential output, domestic demand growth, the government balance as % of GDP and the real effective exchange rate during episodes of current account reversals for each group of exchange rate regime in the 24 quarters surrounding the current account trough. Several important observations can be made.

First, the charts suggest that current account reversals are typically preceded by a significant deterioration of the current account. While patterns are generally similar across exchange rate regimes, there are notable differences in the magnitude of the average deficit attained in the year of the reversal. In particular, the trough occurs on average at -6% of GDP for flexible exchange rate regimes and at -4% for fixed regimes (Table A.7). Following a rapid improvement in the subsequent years, the current account is in balance again for all regimes after about three years. The dynamics of the trade balance (not shown) reflect those of the current account. The trade balance deficit in the trough is smaller than the current account deficit and varies between 3.2% of GDP under flexible exchange rates and 1.6% of GDP under fixed exchange rates. As expected, trade developments explain a good share of the overall current account deficit.

Second, the main driver of the current account reversals in our sample is a dramatic drop in domestic demand growth, in line with Algieri and Bracke (2011), IMF (2005, 2006) and others who find that large current account adjustments tend to occur through marked changes in the overall volume of expenditure rather than expenditure switching. The drop in domestic demand leads to a significant contraction in economic activity. Growth reaches its trough between 3 (fixed and intermediate) and 8 (flexible) quarters following the start of the reversal.

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[12]Table A.3 reports the fine grid provided by Reinhart and Rogoff (2004) while Table A.4 shows our exchange rate regime classification which follows Chinn and Wei (2013).

[13]The dropped observations are: Finland 1992q4 and 1993q1, Italy 1992q4 and 1993q1, Korea 1998q1 and 1998q2.

[14]Given that 5 out of 7 of the reversals which occured under fixed exchange rate regimes took place in EMU countries - albeit at different stages of the monetary integration process - the results for the fixed exchange rate regime group could potentially reflect characteristics specific to EMU currency arrangements.

Figure 1: Average macroeconomic dynamics around the current account trough
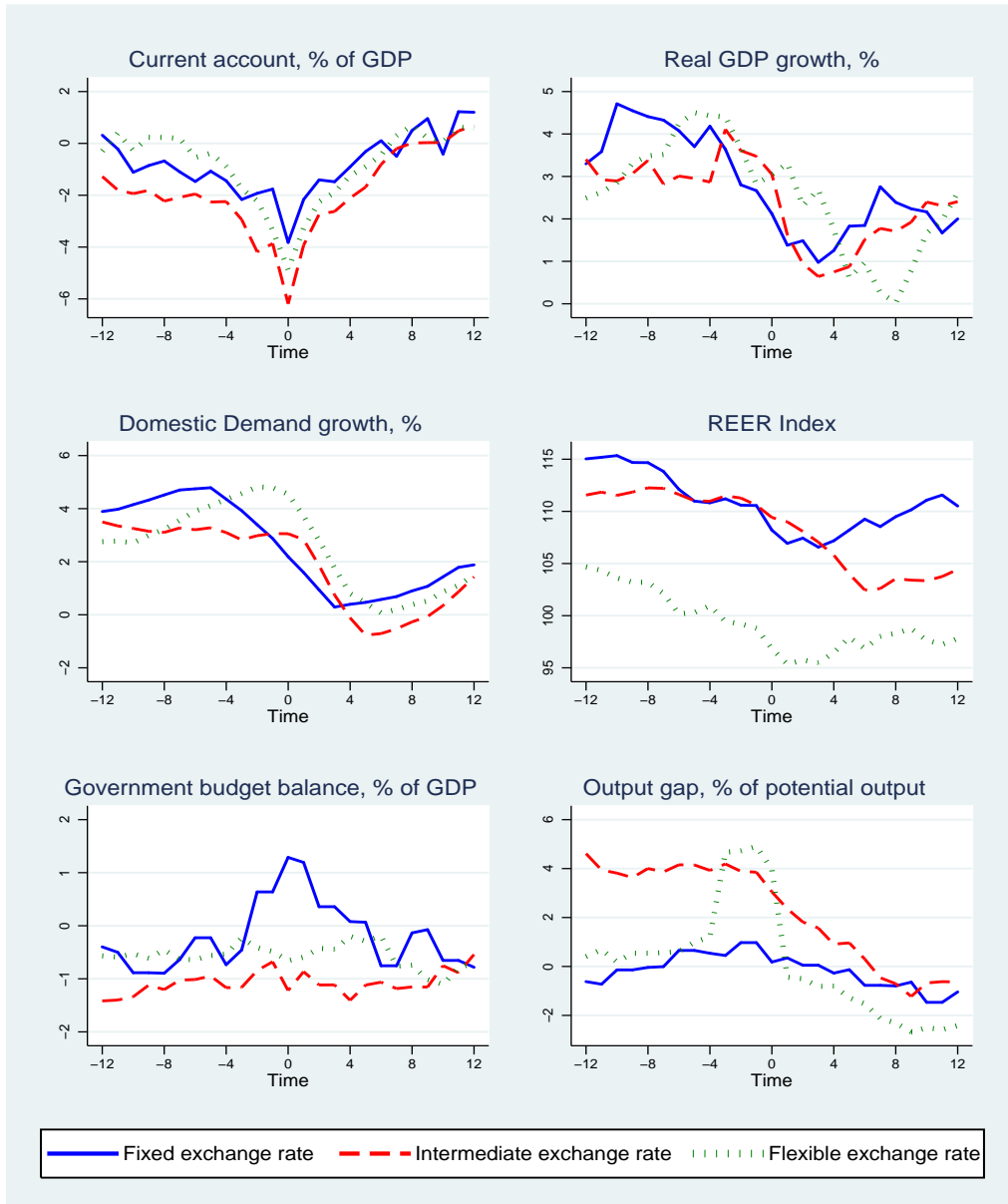
Interestingly, more flexible exchange rate regimes do significantly better in the first year after the reversal but do worse in the second year. One reason for this finding could be that, in our sample, the average country with a reversal episode under fixed exchange rates is significantly more open to trade than its counterparts with more flexible regimes.[15]

Third, the output gap mirrors the dynamics of growth, suggesting that the state of the economy relative to trend may be an important leading indicator for reversals. The output gap reaches its maximum (i.e. the largest gap between actual and potential GDP) just before the adjustment starts and subsequently begins to decline. Interestingly, the output gap shows the largest pre-reversal spike in the case of flexible exchange rate regimes, perhaps reflecting the fact that nominal exchange rate depreciation prior to the reversal fosters a more significant overheating. The real depreciation begins before the current account reversal takes place and continues for a few quarters following the reversal. On average, the depreciation is largest under flexible exchange rates.

Finally, the average dynamics of the government budget balance under fixed exchange rate regimes largely differ from those under more flexible arrangements. While a budget balance consolidation anticipates the current account adjustment under fixed exchange rates, it remains largely unchanged under other types of regimes. Fixed exchange rate regimes appear to impose a stricter fiscal discipline. This contributes to keeping the output gap in check.

3   Predictors of current account reversals

We proceed to identify determinants of current account reversals based on a Probit model. We estimate the model separately for the sample as a whole and the three groups of exchange rate arrangements[16]. We find that the triggers of current account reversals indeed differ across exchange rate regimes.

In the empirical literature, the predictors of reversals are typically identified by way of estimating a binomial discrete choice model where the dependent variable is equal to 1 in the quarter in which the current account reversal starts and 0 otherwise. These models are aimed at estimating how the likelihood of a reversal at a given point in time is affected by variation in the covariates. However, such models are often characterized by a low capacity to identify statistically significant predictors due to the limited number of current account reversals in industrial countries in recent decades.[17] In order to overcome this shortcoming, this paper estimates a Probit model with a forward dependent variable. The forward dependent variable

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[15]Countries with flexible regimes have average trade to GDP ratios of 38% and export to GDP ratios of 19% compared to 64% and 32%, respectively, in the case of less flexible regimes.

[16]We also experimented with estimating an augmented model with interaction terms between exchange rate regime dummies and the explanatory variables in place of the sample splits. However, the limited number of degrees of freedom does not allow including more than a small number of interaction terms at a time. This seems problematic in the present setup given that the entire data generating process may be considered conditional upon the exchange rate regime in place

[17]De Haan et al. (2008) identify 41 episodes, but their sample is very heterogeneous and even includes episodes prior to the end of the Bretton Woods system. Freund (2005) identifies only 25 episodes.

is equal to one not only in the quarter when the current account adjustment starts but also in the 4 quarters before; otherwise, it is equal to 0. This approach is used by Bussiere and Fratzscher (2006) in the context of early warning models for predicting financial crisis. The strategy increases the model's capacity to identify statistically significant determinants in the regressions and allows attenuating potential endogeneity concerns. On the downside, the model does not explain the precise point in time in which a reversal begins but rather determines whether an adjustment is more likely to occur within a given one year time window.

Our preferred specification is reported in Table 1 while the inclusion of additional controls is discussed in the robustness section. Our choice of explanatory variables is in line with existing studies in the literature (Freund 2005; Milesi-Ferretti and Razin 1998), and includes the current account, the output gap, reserves growth, the real effective exchange rate, credit to the private sector, trade openness and the US interest rate. Country dummies are also included but not reported in the tables[18]. Table 1 illustrates the estimation results.

The findings suggest that a larger current account deficit is linked to a higher likelihood of a current account reversal, irrespective of the exchange rate regime in place. This result is unsurprising in that it suggests that the likelihood of current account sustainability is linked to investors' willingness to lend as the deficit grows (Milesi-Ferretti and Razin 1998). Similarly, the output gap is a significant predictor of reversals under all exchange rate arrangements: a larger output gap is associated with a higher likelihood of a reversal. Intuitively, the result suggests that reversals occur when an economy is overheating, signalling that domestic demand is overstretching the productive capacity of the economy.

A number of explanatory variables explain current account reversals under fixed or interme-diate exchange rate regimes while they cannot be identified as significant determinants under flexible exchange rates.

First, a decline in foreign reserves leads to a higher likelihood of a reversal - in line with sol-vency and willingness to lend considerations (Milesi-Ferretti and Razin 1998) - only in countries with fixed and intermediate exchange rate regimes. This result is as expected since reserves are needed to defend tightly managed exchange rates in the presence of potentially large capital outflows while the same is not the case under flexible exchange rate regimes.

Second, increases in private credit significantly raise the likelihood of current account rever-sals under more rigid exchange rate regimes. Intuitively, under fixed exchange rates, a credit expansion may exacerbate inflationary pressures leading to an overvaluation of the currency as the nominal exchange rate cannot adjust. Such overvaluation may trigger a drain of foreign reserves, reduce the competitiveness of domestic products, aggravate the current account deficit and thus raise doubts about its sustainability. In contrast, under flexible exchange rate regimes, credit growth is not a significant trigger of reversals. Intuitively, its inflationary effects will not necessarily lead to an overvaluation as the nominal exchange rate can adjust.

Third, the analysis finds that an increase in the US interest rate - an indicator of the

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[18]Time dummies were excluded due to joint insignificance based on an F-test.

international cost of borrowing - leads to a higher probability of a reversal under fixed exchange rate. Intuitively, a rise in the international cost of borrowing diminishes a country's ability to finance its current account deficit. This is true especially in economies with a fixed exchange rate and an open capital account in which monetary policy is not fully independent. Hence, an increase in the international cost of borrowing forces domestic interest rates to rise and domestic demand to contract potentially triggering a reversal.

Finally, an increase in the degree of trade openness also reduces the probability of current account reversals only under non-freely floating exchange rate regimes. Intuitively, countries with larger export sectors can more easily service external debt due to the larger amount of export proceeds, thus attenuating sustainability concerns.

In contrast, the real effective exchange rate is a significant predictor of current account reversals only in the cases of flexible regimes. In particular, exchange rate depreciation significantly raises the probability of a reversal to occur in such episodes. This result is in line with the graphical analysis which shows that the real depreciation that tends to anticipate current account reversals is more pronounced under flexible arrangements.

A Chow test confirms that the coefficient estimates are indeed significantly different from each other between the three subsamples.

Table 1: Probit model: triggers of current account reversals by exchange rate regime

	Fixed exchange rate regime (1)	Intermediate exchange rate regime (2)	Flexible exchange rate regime (3)	Whole sample (4)
Current account as % of GDP	-0.576***	-0.144***	-0.0820**	-0.157***
	(0.130)	(0.0249)	(0.0333)	(0.0179)
Output gap	0.492***	0.0392*	0.286***	0.0797***
	(0.146)	(0.0210)	(0.0661)	(0.0153)
Total reserves growth	-2.170***	-0.395*	0.150	-0.193
	(0.746)	(0.217)	(0.291)	(0.156)
Real effective exchange rate	0.0331	-0.00962	-0.0302**	-0.0218***
	(0.0374)	(0.00965)	(0.0125)	(0.00583)
Domestic credit to private sector over GDP	0.114***	0.00907**	-0.00192	0.000778
	(0.0313)	(0.00436)	(0.00472)	(0.00237)
Trade openness	-4.417**	-2.863**	-3.152	-0.773
	(2.201)	(1.389)	(3.018)	(0.701)
US short term interest rate	0.239***	0.0240	-0.0232	0.0607***
	(0.0765)	(0.0228)	(0.0498)	(0.0146)
Pseudo R^2	0.62	0.25	0.37	0.25
Observations	761	848	741	2350

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 Is there a causal link between current account reversals and growth?

This section examines the effects of current account reversals on real GDP growth in advanced economies. The event study shows that current account reversals are typically accompanied by slowdowns in economic growth. Within this context, an interesting question is whether the reversal itself has an impact on growth that is independent of the factors that caused the correction. Croke et al. (2006) and Debelle and Galati (2007) studied the link between current account reversals and economic growth in industrial economies. Their work does not find any significant evidence in support of a causal link between the reversal and the fall in growth.

However, an interesting question is whether the exchange rate regime that is in place during a reversal conditions the effect of the reversal on growth. In other words, does a reversal hurt growth under some exchange rate regimes while it does not under others? To answer this question, we study whether there is a significant association between current account reversals and growth in industrial economies and whether it is conditioned by the exchange rate regime. To this end, following Edwards (2004a) and Edwards (2004b), we estimate a treatment effects model both for the whole sample and for the 3 subsamples identified according to the de-facto exchange rate regime in place 4 quarters before the reversal. The model allows jointly estimating an outcome equation on real GDP growth and a Probit equation on the likelihood that a country experiences a current account reversal. The estimated treatment effects model is described by the equations below:

$$y_{it} = \alpha + \beta \mathbf{X}_{i,t} + \delta r_{it} + \varepsilon_{it} \tag{1}$$

$$r_i^* = \mu + \gamma \mathbf{Z}_{i,t} + \nu_{it} \tag{2}$$

$$r_{it} = \left\{ \begin{array}{ll} = 1 & \text{if } r_{it}^* > 0 \\ = 0 & \text{otherwise} \end{array} \right\} \tag{3}$$

where $i = 1, ..., 22$ is the country sample and $t = 1970Q1, ..., 2007Q4$ indicates the time period.

Equation (1) can be estimated consistently by OLS only if $E(\varepsilon_{it}\nu_{it}) = 0$, i.e. if the errors of the two equations are not correlated. If the errors are correlated, as it is likely, i.e. $E(r_{it}\varepsilon_{it}) \neq 0$, then an OLS estimate of equation (1) produces inconsistent estimates. We assume that ε_{it} and ν_{it} are jointly normally distributed with zero means and the variance-covariance matrix Σ:

$$\Sigma = \left[\begin{array}{cc} \sigma_\varepsilon^2 & \sigma_{\varepsilon\nu} \\ \sigma_{\nu\varepsilon} & 1 \end{array} \right] \tag{4}$$

We estimate the model using the two-step procedure introduced by Heckman (1978), assum-

ing without loss of generality, that $\sigma_\nu^2 = 1$, since this parameter is not identified by the Probit model. We assume that a current account reversal occurs if the latent variable r_{it}^* is larger than 0. The latent variable is the dependent variable of the Probit equation (2) and is a function of $\mathbf{Z}_{i,t}$ which is a $(1 \times g)$ vector that comprises the same covariates that were used in the previous section for the identification of triggers of current account reversals. The regressors are lagged by one period to avoid endogeneity. In the outcome equation (1), the dependent variable is GDP growth while r_{it} is the current account reversal dummy which is equal to 1 in the quarter when an adjustment starts and 0 otherwise. Thus, δ is the parameter of interest which captures the effect of the treatment on the outcome, i.e. of the reversal on growth. $\mathbf{X}_{i,t}$ is a $(1 \times m)$ vector that contains the explanatory variables which are chosen to control for any macroeconomic adjustment driving the reversal, including investment, government consumption, trade openness, the inflation rate and the change in the terms of trade. Country dummies are included but not reported.

The estimation results are reported in Table 2. The upper panel reports the results for the outcome equation while the lower panel reports those of the treatment equation. As Table 2 documents, the treatment equation provides results qualitatively similar to those presented in the previous section. However, the current model does not employ a forward dependent variable and thus has a lower capacity of identifying statistically significant determinants of current account reversals.

The results of the outcome equation are generally in line with the growth literature: we find that an increase in investment, deeper trade integration, a decline in government consumption and lower inflation are associated with higher GDP growth, both in the whole sample and in the 3 subsamples.

The regressor of interest to our exercise is the reversal dummy. Table 2 shows that neither the reversal dummy nor its lag are significant in the full sample of reversal episodes. What is more, the distinction between exchange rate regimes does not appear to make a difference. Neither under flexible nor under fixed exchange rate regimes does a reversal appear to have a statistically significant effect on growth. In conjunction with the results found in Edwards (2004a) and Edwards (2004b), we interpret our findings as suggesting that current account reversals hurt growth in developing economies with fixed exchange rates as the reversal takes place in a disorderly fashion. In developing economies, current account reversals are often accompanied by exchange rate and banking crises. In industrial economies, on the other hand, there is no evidence for a causal relationship between reversals and growth, neither under more rigid nor under more flexible exchange rate regimes. A possible explanation is that in industrial economies reversals occurs in a less disorderly fashion and industrial economies dispose of a larger variety of effective shock absorbers.[19]

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[19]Table 2 also reports the hazard rate estimated by the Probit equation and added as an additional covariate to the growth equation.

Table 2: Treatment effects model: current account reversals' effect on real economic performance

	Fixed exchange rate regime		Intermediate exchange rate regime		Flexible exchange rate regime		Whole sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Real GDP growth								
Investment as % of GDP	18.98***	18.89***	28.32***	28.37***	30.13***	30.11***	27.85***	27.88***
	(3.382)	(3.395)	(2.241)	(2.238)	(2.584)	(2.588)	(1.295)	(1.295)
Trade openness	1.045**	1.050**	11.05***	11.02***	7.559***	7.563***	4.569***	4.575***
	(0.430)	(0.432)	(0.939)	(0.937)	(1.604)	(1.604)	(0.423)	(0.423)
Government consumption expenditure as % of GDP	-37.83***	-37.70***	-39.66***	-39.71***	-27.10***	-27.10***	-25.19***	-25.24***
	(6.212)	(6.233)	(3.802)	(3.796)	(3.393)	(3.393)	(1.799)	(1.800)
Inflation rate	-0.261***	-0.261***	-0.216***	-0.216***	-0.325***	-0.325***	-0.200***	-0.199***
	(0.0258)	(0.0259)	(0.0177)	(0.0177)	(0.0264)	(0.0265)	(0.0107)	(0.0107)
Terms of trade change	0.0185	0.0176	0.0407	0.0399	-0.0122	-0.0119	0.0232	0.0221
	(0.0509)	(0.0510)	(0.0327)	(0.0326)	(0.0277)	(0.0278)	(0.0202)	(0.0203)
Reversal	1.684	2.483	-0.709	-0.187	-0.932	-0.962	1.523	1.800
	(2.201)	(2.414)	(2.298)	(2.339)	(1.939)	(1.957)	(1.300)	(1.312)
L.Reversal		-0.513		-0.695		0.0670		-0.396
		(0.668)		(0.533)		(0.619)		(0.336)
Reversal								
L.Current account as % of GDP	-0.301*	-0.301*	-0.0648*	-0.0648*	-0.102	-0.102	-0.100***	-0.100***
	(0.164)	(0.164)	(0.0354)	(0.0354)	(0.0643)	(0.0643)	(0.0262)	(0.0262)
L.Output gap	0.341	0.341	0.0359	0.0359	0.265*	0.265*	0.0483***	0.0483***
	(0.210)	(0.210)	(0.0354)	(0.0354)	(0.146)	(0.146)	(0.0169)	(0.0169)
L.Total reserves growth	-1.298	-1.298	-0.504	-0.504	-0.108	-0.108	-0.328	-0.328
	(1.235)	(1.235)	(0.388)	(0.388)	(0.546)	(0.546)	(0.276)	(0.276)
L.Real effective exchange rate	0.00784	0.00784	-0.0166**	-0.0166**	-0.0123	-0.0123	-0.0211***	-0.0211***
	(0.0596)	(0.0596)	(0.00817)	(0.00817)	(0.0110)	(0.0110)	(0.00397)	(0.00397)
L.Trade openness	-2.360	-2.360	-3.594*	-3.594*	-4.887	-4.887	-1.199	-1.199
	(2.950)	(2.950)	(1.852)	(1.852)	(4.131)	(4.131)	(0.971)	(0.971)
L.Domestic credit to private sector over GDP	0.0651	0.0651	0.00921	0.00921	0.00292	0.00292	0.00141	0.00141
	(0.0429)	(0.0429)	(0.00693)	(0.00693)	(0.00828)	(0.00828)	(0.00397)	(0.00397)
L.US interest rate	0.142	0.142	0.0281	0.0281	-0.0271	-0.0271	0.0399*	0.0399*
	(0.123)	(0.123)	(0.0362)	(0.0362)	(0.0863)	(0.0863)	(0.0232)	(0.0232)
Lambda	-0.676	-1.099	0.359	0.112	0.520	0.537	-0.533	-0.662
	(1.092)	(1.203)	(1.014)	(1.035)	(0.926)	(0.938)	(0.561)	(0.567)
Wald χ^2	3046.9***	3019.8***	2862.6***	2877.9***	1955.5***	1955.0***	6268.2***	6254.8***
Observations	759	759	834	834	733	733	2326	2326

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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5 Robustness checks

We perform a sequence of robustness checks to ensure the stability of the results, both for the Probit analysis used to identify the determinants of reversals and for the treatment effects regressions studying the potential link between reversals and growth.

We begin by experimenting with the inclusion of additional control variables in our Probit specification. In particular, we include variables measuring the change in the terms of trade, portfolio equity liabilities and per capita GDP. As shown in Table A.11, the main results of the analysis are robust to the inclusion of these additional controls. GDP per capita is insignificant in all specifications we tried while the variables measuring the change in the terms of trade and portfolio equity liabilities are significant only under fixed exchange rate regimes. Both an improvement in the terms of trade an increase in portfolio equity liabilities are associated with a higher likelihood of experiencing a reversal under fixed exchange rate regimes. Furthermore, We include linear and quadratic time trends in the benchmark regressions in an effort to control more effectively for the presence of possible time trends. As Table A.12 reports, the main results of the trigger analysis are generally qualitatively robust to the specification changes.

We also test the robustness of our results to using an alternative measure of current account reversals for the dependent variable. In particular, we define a current account correction as a reversal if the current account deficit is larger than 2% of GDP when the reversal starts and conditions 2, 3, and 4 (listed in Section 2) hold. While this stricter definition of a reversal implies losing seven episodes of current account reversals, Table A.13 illustrates that our results are qualitatively very similar to the benchmark analysis although the significance of some results suffers from the reduction in the degrees of freedom.

We then proceed with the robustness analysis for the treatment effects model and begin by including additional control variables in the benchmark specification. In particular, we add net foreign direct investment, the old age dependency ratio and the labor force participation rate as additional controls to the outcome equation (1) (Table A.14). In all of these additional specifications, the reversal dummy remains insignificant, confirming our finding that there is no causal link between reversals and growth in industrial economies. As regards the additional controls, foreign direct investment does not turn out to be significant in any of the specifications we tried. The old age dependency ratio, on the other hand, is always significant and its coefficient is consistently negative. Intuitively, an increase in old age dependency leads to a higher burden to social security and the public health system and implies that a smaller share of the population is in productive employment. Moreover, older individuals tend to save less which reduces national savings and investment. Finally, the labor force participation rate is positive and significant under flexible exchange rates and in the whole sample but not under fixed exchange rates. Indeed, higher labor force participation implies a higher supply of labor and this may lead to a higher level of production and faster real GDP growth.

We also test the robustness of the treatment effects results to using a different definition of current account reversals as previously done for the Probit model. Once again, our findings are

robust to this change in the definition of the dependent variable. Table A.15 shows that neither the reversal dummy nor its lag are significant. Finally, we estimate the benchmark specification of the outcome equation (1) using both a panel model with random effects and a panel model with country fixed effects. The findings are reported in Tables A.16 and A.17 and support the conclusions drawn on the benchmark model.

6 Conclusions

The present paper is motivated by the large current account imbalances experienced by advanced economies both before the global crisis and presently and provides a systematic analysis of current account reversals in these countries across different de-facto exchange rate regimes. In particular, the paper examines whether industrial economies follow different patterns during reversal episodes depending on the exchange rate regime they have in place. It identifies triggers of reversals and examines the link between reversals and growth across different exchange rate regimes.

The empirical analysis proceeds as follows: we initially identify 43 episodes of current account reversals in 22 industrial economies between 1970 and 2007. The episodes are classified into three groups of exchange rate regimes: fixed exchange rate regime, intermediate exchange rate regime and flexible exchange rate regime. A brief event study sets the stage for the empirical analysis which is split into two parts. In the first part, we estimate a Probit model for the sample as a whole and separately for each group of exchange rate regime in an effort to identify predictors of current account reversals. In the second part, we estimate a treatment effects model to test whether reversals have an independent effect on growth and whether this effect depends on the exchange rate regime in place.

We find that larger deficits and larger output gaps are associated with a higher probability of experiencing reversals across all exchange rate regimes. Conversely, lower reserves growth, higher domestic credit growth, higher US interest rates and a more closed economy raise the probability of a reversal only under less flexible exchange rate regimes. A real exchange rate depreciation, on the other hand, is a significant trigger only under more flexible regimes. Furthermore, the treatment effects model suggests that adjustments of current account imbalances are not per se harmful to economic activity, neither in the sample as a whole nor in the sub-sample of fixed exchange rate regimes.

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Table A.1: Countries in sample

No.	Country
1.	Australia
2.	Austria
3.	Belgium
4.	Canada
5.	Denmark
6.	Finland
7.	France
8.	Germany
9.	Greece
10.	Ireland
11.	Italy
12.	Korea
13.	Japan
14.	Netherlands
15.	New Zealand
16.	Norway
17.	Portugal
18.	Spain
19.	Sweden
20.	Switzerland
21.	United Kingdom
22.	United States

Table A.2: Definitions and sources of variables

Variable Name	Description	Source
Current account as % of GDP	Current Account as % of GDP	OECD, EO
Domestic credit to private sector over GDP	Domestic credit to private sector as % of GDP	WB, WDI
Domestic demand	Total domestic demand	OECD, EO
Nominal GDP	Gross domestic product	OECD, EO
Output gap	Output gap in % of potential output	OECD, EO and IMF, WEO
Real effective exchange rate	Real effective exchange rate (27 cty)index (2000=100), CPI based	BIS
Real GDP	Gross domestic product	OECD, EO
Government budget balance as % of GDP	Government primary balance as % of GDP	OECD, EO
Government consumption	Government consumption expenditure	IMF, IFS
Investment	Gross total fixed capital	OECD, EO
Total foreign reserves	Total reserves minus gold	WB, WDI
Short term interest rate	Money market rate	IMF, IFS
Consumer price index	Consumption price index (2000=100)	OECD, EO
De-facto exchange rate regime	Fine exchange rate regime classification	Ilzetzki et al. (2008)
Trade openness	Exports plus Imports as % of GDP	WB, WDI
Terms of trade	Terms of trade	WB, WDI
Inflation rate	Consumption price index (2000=100) growth	OECD, EO
Foreign direct investment as % of GDP	Foreign direct investment as % of GDP	Lane and Milesi-Ferretti (2007)
Old age dependency ratio	Old age dependency ratio as % of working age population	WB, WDI
Labor force participation rate	Labor force participation rate as % of working age population	OECD, EO
GDP per capita	GDP per capita	WB, WDI
Portfolio equity liabilities	Portfolio equity liabilities	Lane and Milesi-Ferretti (2007)

Figure A.2: Current account reversals by country between 1970 and 2007

Figure A.3: Current account reversals by country between 1970 and 2007

Table A.3: The natural classification bucket, the Reinhart-Rogoff (RR)(2004) fine grid

Natural classification bucket	RR Fine grid
No separate legal tender	1
Preannounced peg or currency board arrangement	2
Preannounced horizontal band that is narrower than or equal to +/-2%	3
De facto peg	4
Preannounced crawling peg	5
Preannounced crawling band that is narrower than or equal to +/-2%	6
De facto crawling peg	7
De facto crawling band that is narrower than or equal to +/-2%	8
Preannounced crawling band that is wider than +/-2%	9
De facto crawling band that is narrower than or equal to +/-5%	10
Noncrawling band that is narrower than or equal to +/-2%	11
Managed floating	12
Freely floating	13
Freely falling	14

Table A.4: Exchange rate regime classification

Our own classification	RR's fine grid codes
Fixed exchange rate regime	1, 2, 3, 4
Intermediate exchange rate regime	5, 6, 7, 8, 9, 10, 11
Flexible exchange rate regime	12, 13

Table A.5: Exchange rate regimes in industrial countries,1970-2007

Exchange rate regime	1970q1-1979q4		1980q1-1989q4		1990q1-1999q4		2000q1-2007q4		1970q1-2007q4	
	Obs.	%	Obs.	%	Obs.	%	Obs.	%	Obs.	%
Fixed	264	30	119	13.52	310	35.23	384	54.55	1077	32.21
Intermediate	446	50.68	481	54.66	266	30.23	124	17.61	1317	39.38
Flexible	170	19.32	280	31.82	298	33.86	196	27.84	944	28.23
Total	880	100.0	880	100.0	880	100.0	704	100.0	3344	100.0

Table A.6: Episodes of current account reversals by exchange rate regime

No.	Country	Year	Current Account as % of GDP	Exchange rate regime
1.	Australia	1989q2	-6.17	Flexible
2.	Australia	1999q2	-5.87	Flexible
3.	Austria	1980q2	-6.02	Intermediate
4.	Austria	1997q4	-3.06	Fixed
5.	Austria	2001q1	-2.12	Fixed
6.	Belgium	1982q1	-7.53	Fixed
7.	Canada	1981q3	-4.67	Intermediate
8.	Canada	1993q4	-4.23	Intermediate
9.	Canada	1997q3	-2.47	Intermediate
10.	Denmark	1986q2	-6.18	Intermediate
11.	Denmark	1998q4	-2.45	Intermediate
12.	Finland	1991q1	-6.33	Intermediate
13.	France	1976q3	-2.33	Intermediate
14.	France	1982q3	-1.16	Intermediate
15.	France	1990q3	-0.84	Fixed
16.	Germany	1980q4	-2.45	Flexible
17.	Germany	2000q3	-2.30	Fixed
18.	Greece	1985q3	-8.57	Flexible
19.	Greece	1990q1	-6.06	Intermediate
20.	Ireland	1982q1	-14.90	Intermediate
21.	Ireland	1990q4	-3.84	Intermediate
22.	Italy	1974q3	-5.06	Intermediate
23.	Italy	1981q1	-4.01	Flexible
24.	Italy	1992q3	-2.72	Intermediate
25.	Japan	1974q1	-2.29	Intermediate
26.	Japan	1979q4	-1.79	Flexible
27.	Korea	1980q1	-9.66	Fixed
28.	Korea	1996q3	-5.02	Intermediate
29.	The Netherlands	1980q1	-1.31	Intermediate
30.	The Netherlands	2000q3	-1.22	Fixed
31.	New Zealand	1984q4	-15.12	Intermediate
32.	New Zealand	1999q4	-8.44	Flexible
33.	Norway	1986q2	-11.51	Flexible
34.	Norway	1998q4	-3.57	Flexible
35.	Portugal	1981q4	-17.43	Intermediate
36.	Spain	1982q2	-18.32	Intermediate
37.	Sweden	1982q4	-4.89	Intermediate
38.	Sweden	1992q1	-3.34	Intermediate
39.	Switzerland	1980q4	-1.08	Flexible
40.	United Kingdom	1974q2	-5.56	Flexible
41.	United Kingdom	1979q1	-4.31	Flexible
42.	United Kingdom	1988q4	-1.45	Flexible
43.	United States	1987q4	-3.38	Flexible

Figure A.4: De-facto exchange rate regime by country between 1970 and 2007 according to the data provided by Ilzetzki, Reinhart and Rogoff (2008)
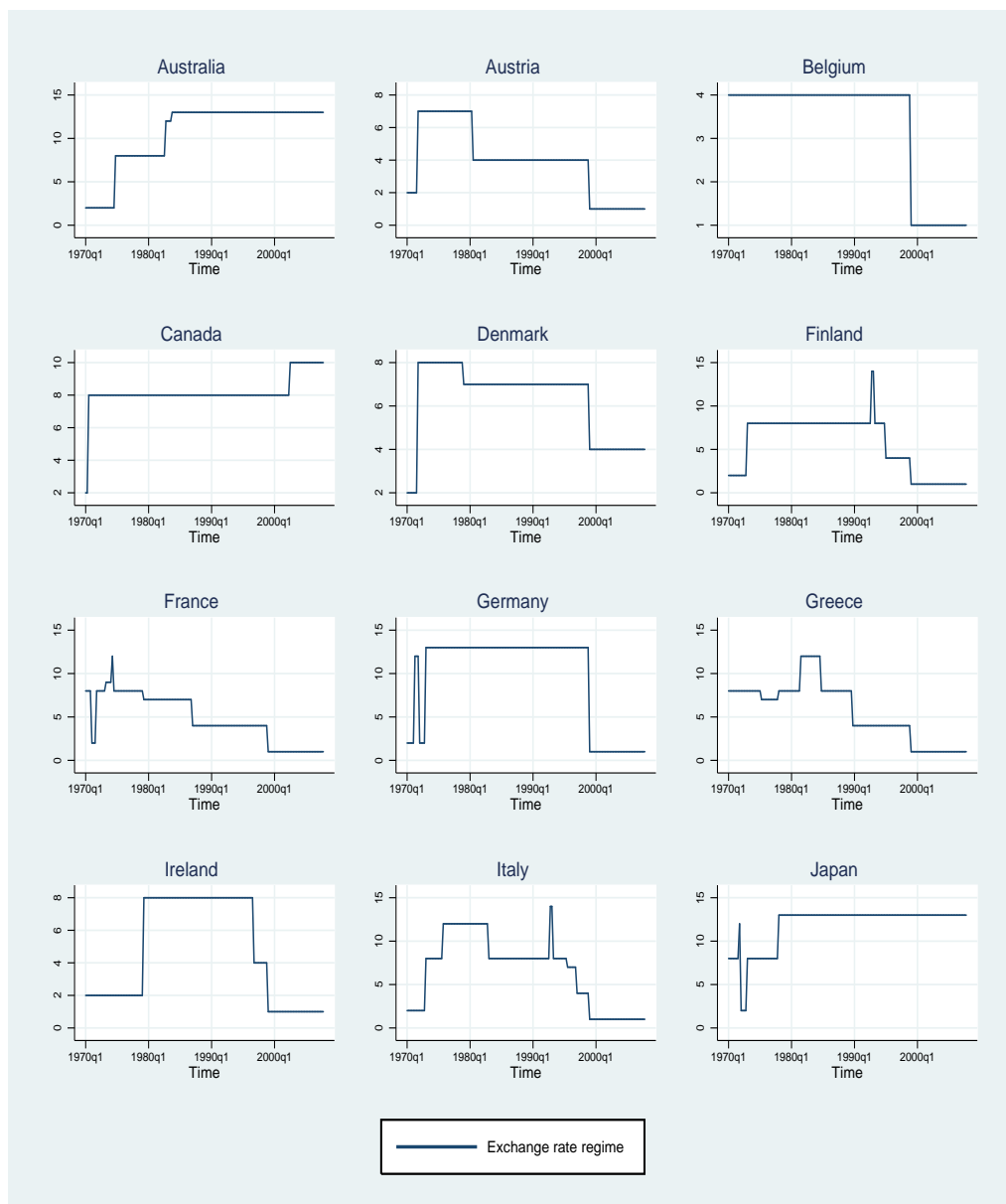
Figure A.5: De-facto exchange rate regime by country between 1970 and 2007 according to the data provided by Ilzetzki, Reinhart and Rogoff (2008)
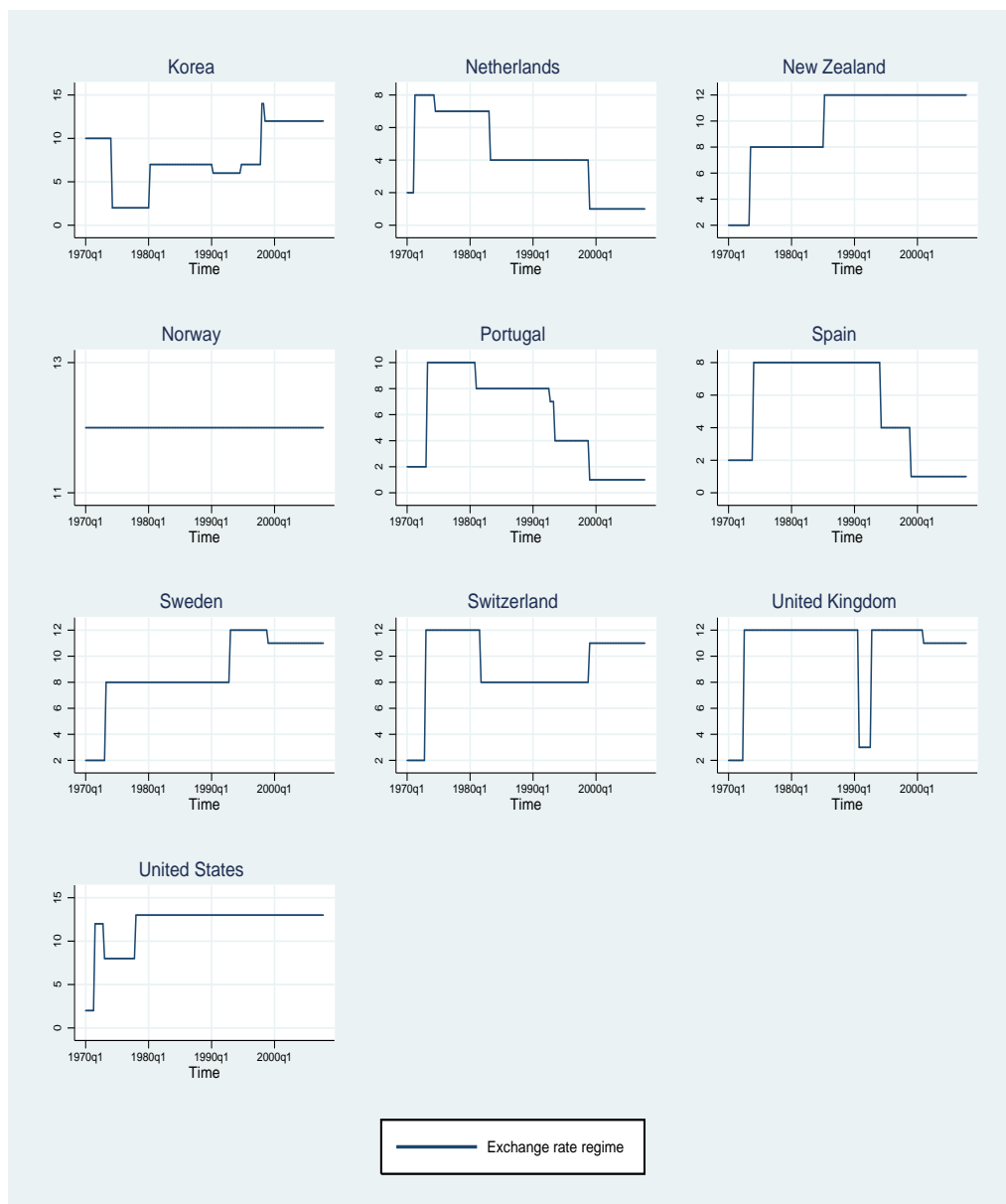
Table A.7: Average dynamics of the current account as % of GDP around the adjustment episode by exchange rate regime

	Year relative to deficit minimum					
	-3	-2	-1	0	1	2	3
Fixed exchange rate	-0.47	-1.08	-1.82	-3.82	-1.49	-0.05	0.74
Intermediate exchange rate	-1.71	-2.13	-3.31	-6.19	-2.85	-0.67	0.30
Flexible exchange rate	0.02	-0.12	-2.05	-4.87	-2.16	-0.09	0.37

Table A.8: Average dynamics of the real GDP growth around the adjustment episode by exchange rate regime

	Year relative to deficit minimum					
	-3	-2	-1	0	1	2	3
Fixed exchange rate	4.04	4.13	3.32	2.12	1.27	2.20	2.02
Intermediate exchange rate	3.16	3.02	3.51	3.06	1.05	1.43	2.19
Flexible exchange rate	2.82	3.94	3.83	3.05	2.51	0.46	1.76

Table A.9: Average dynamics of the real domestic demand growth around the adjustment episode by exchange rate regime

	Year relative to deficit minimum						
	-3	-2	-1	0	1	2	3
Fixed exchange rate	4.09	4.69	3.64	2.19	0.80	0.66	1.54
Intermediate exchange rate	3.31	3.22	2.99	3.05	1.33	-0.57	0.64
Flexible exchange rate	2.81	3.70	4.63	4.55	2.27	0.27	1.00

Table A.10: Average dynamics of the real effective exchange rate index around the adjustment episode by exchange rate regime

	Year relative to deficit minimum						
	-3	-2	-1	0	1	2	3
Fixed exchange rate	115.07	112.90	110.80	108.20	107.03	108.88	110.83
Intermediate exchange rate	111.70	111.78	111.08	109.42	107.49	103.15	103.74
Flexible exchange rate	103.97	101.45	99.60	96.84	95.76	97.77	97.86

Table A.11: Probit model with additional explanatory variables: triggers of current account reversals by exchange rate regime

	Fixed exchange rate regime			Intermediate exchange rate regime			Flexible exchange rate regime			Whole sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Current account as % of GDP	-0.607***	-0.667***	-0.576***	-0.144***	-0.160***	-0.144***	-0.0815**	-0.0836**	-0.0820**	-0.156***	-0.150***	-0.157***
	(0.140)	(0.151)	(0.130)	(0.0250)	(0.0268)	(0.0249)	(0.0334)	(0.0334)	(0.0333)	(0.0180)	(0.0182)	(0.0179)
Output gap	0.515***	0.617***	0.492***	0.0389*	0.0383*	0.0392*	0.286***	0.306***	0.286***	0.0798***	0.0824***	0.0797***
	(0.152)	(0.166)	(0.146)	(0.0211)	(0.0211)	(0.0210)	(0.0664)	(0.0705)	(0.0661)	(0.0153)	(0.0155)	(0.0153)
Total reserves growth	-2.335***	-2.180***	-2.170***	-0.400*	-0.419*	-0.395*	0.127	0.0567	0.150	-0.193	-0.241	-0.193
	(0.766)	(0.740)	(0.746)	(0.218)	(0.221)	(0.217)	(0.296)	(0.302)	(0.291)	(0.156)	(0.161)	(0.156)
Real effective exchange rate	0.0250	0.0341	0.0331	-0.00987	-0.00729	-0.00961	-0.0308**	-0.0249*	-0.0302**	-0.0218***	-0.0206***	-0.0218***
	(0.0385)	(0.0372)	(0.0374)	(0.00969)	(0.00970)	(0.00965)	(0.0126)	(0.0128)	(0.0125)	(0.00583)	(0.00586)	(0.00583)
Domestic credit to private sector over GDP	0.123***	0.134***	0.114***	0.00905**	0.00839*	0.00907**	-0.00180	0.00155	-0.00192	0.000745	0.00249	0.000778
	(0.0327)	(0.0343)	(0.0313)	(0.00436)	(0.00435)	(0.00436)	(0.00475)	(0.00580)	(0.00472)	(0.00237)	(0.00262)	(0.00237)
Trade openness	-5.265**	-6.995***	-4.417**	-2.877**	-3.028**	-2.862**	-3.356	-1.085	-3.152	-0.785	-0.716	-0.773
	(2.371)	(2.628)	(2.201)	(1.392)	(1.472)	(1.389)	(3.037)	(3.256)	(3.018)	(0.703)	(0.726)	(0.701)
US short term interest rate	0.232***	0.277***	0.239***	0.0238	0.0272	0.0240	-0.0228	-0.0475	-0.0232	0.0604***	0.0590***	0.0607***
	(0.0789)	(0.0824)	(0.0765)	(0.0228)	(0.0237)	(0.0228)	(0.0498)	(0.0532)	(0.0498)	(0.0147)	(0.0149)	(0.0146)
Terms of trade change	0.0403*			-0.00198			-0.00991			0.00154		
	(0.0207)			(0.0124)			(0.0186)			(0.00754)		
Portfolio equity liabilities		5.627**			1.418			-2.640			-0.332	
		(2.316)			(1.209)			(2.411)			(0.289)	
GDP per capita			0.00172			-0.000662			-0.000141			-0.000103
			(0.634)			(0.195)			(0.000112)			(0.000600)
Pseudo R^2	0.64	0.65	0.62	0.25	0.26	0.25	0.37	0.38	0.37	0.25	0.25	0.25
Observations	761	761	761	846	843	848	740	730	741	2347	2334	2350

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Table A.12: Probit model with linear and quadratic time trends: triggers of current account reversals by exchange rate regime

	Fixed exchange rate regime		Intermediate exchange rate regime		Flexible exchange rate regime		Whole sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Current account as % of GDP	-0.559***	-0.762***	-0.186***	-0.181***	-0.0864**	-0.0969***	-0.160***	-0.182***
	(0.137)	(0.214)	(0.0279)	(0.0281)	(0.0343)	(0.0372)	(0.0182)	(0.0196)
Output gap	0.555***	0.273	0.0419*	0.0365*	0.289***	0.293***	0.0802***	0.0783***
	(0.154)	(0.188)	(0.0215)	(0.0215)	(0.0665)	(0.0663)	(0.0152)	(0.0143)
Total reserves growth	-2.169***	-2.106**	-0.383	-0.460*	0.204	0.334	-0.168	-0.230
	(0.755)	(1.014)	(0.233)	(0.243)	(0.301)	(0.315)	(0.157)	(0.167)
Real effective exchange rate	0.0399	0.108	-0.0109	-0.0141	-0.0315**	-0.0250*	-0.0225***	-0.0194***
	(0.0391)	(0.0689)	(0.0103)	(0.0105)	(0.0126)	(0.0133)	(0.00587)	(0.00621)
Domestic credit to private sector over GDP	0.100***	0.0778*	-0.00174	0.00254	-0.00716	-0.00762	-0.00187	0.00174
	(0.0330)	(0.0410)	(0.00473)	(0.00534)	(0.00877)	(0.00903)	(0.00299)	(0.00338)
Trade openness	-7.598**	-4.538	-4.869***	-4.059**	-4.368	-1.272	-1.187	0.194
	(3.153)	(3.692)	(1.579)	(1.618)	(3.507)	(3.851)	(0.770)	(0.830)
US short term interest rate	0.401***	1.144***	0.145***	0.183***	0.000575	0.0123	0.0838***	0.153***
	(0.124)	(0.390)	(0.0338)	(0.0394)	(0.0594)	(0.0635)	(0.0216)	(0.0259)
Linear time trend	0.0372**	0.571***	0.0322***	0.0843***	0.00848	0.0856**	0.00531	0.0907***
	(0.0182)	(0.198)	(0.00647)	(0.0272)	(0.0120)	(0.0424)	(0.00365)	(0.0160)
Quadratic time trend		-0.00233***		-0.000297**		-0.000401*		-0.000453***
		(0.000825)		(0.000151)		(0.000213)		(0.0000832)
Pseudo R^2	0.64	0.71	0.30	0.31	0.37	0.38	0.25	0.28
Observations	761	761	848	848	741	741	2350	2350

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.13: Probit model: triggers of current account reversals by exchange rate regime

	Fixed exchange rate regime (1)	Intermediate exchange rate regime (2)	Flexible exchange rate regime (3)	Whole sample (4)
Current account as % of GDP	-0.641***	-0.144***	-0.0699**	-0.146***
	(0.166)	(0.0249)	(0.0327)	(0.0181)
Output gap	0.275	0.0392*	0.298***	0.0702***
	(0.180)	(0.0210)	(0.0673)	(0.0146)
Total reserves growth	-1.047	-0.395*	0.122	-0.151
	(0.893)	(0.217)	(0.294)	(0.155)
Real effective exchange rate	0.0217	-0.00962	-0.0365***	-0.0224***
	(0.0471)	(0.00965)	(0.0131)	(0.00594)
Domestic credit to private sector over GDP	0.127***	0.00907**	-0.000213	0.000668
	(0.0412)	(0.00436)	(0.00482)	(0.00244)
Trade openness	-3.695**	-2.863**	-4.844	-1.624**
	(1.830)	(1.389)	(3.122)	(0.806)
US short term interest rate	0.195*	0.0240	0.00725	0.0633***
	(0.109)	(0.0228)	(0.0509)	(0.0153)
Pseudo R^2	0.65	0.25	0.36	0.26
Observations	761	848	741	2350

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
The dependent variable is equal to 1 only if the current account is lower than 2% of GDP.

Table A.14: Treatment effects model with additional regressors: current account reversals' effect on real economic performance

	Fixed exchange rate regime			Intermediate exchange rate regime			Flexible exchange rate regime			Whole sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Real GDP growth												
Investment as % of GDP	18.37*** (3.392)	22.20*** (3.356)	17.79*** (3.391)	28.58*** (2.243)	30.36*** (2.410)	24.71*** (2.580)	30.03*** (2.626)	29.63*** (2.589)	24.68*** (2.586)	27.92*** (1.301)	28.67*** (1.302)	24.54*** (1.375)
Trade openness	0.788* (0.465)	2.735*** (0.517)	1.230*** (0.430)	10.72*** (0.998)	12.03*** (1.034)	10.68*** (0.964)	7.479*** (1.631)	8.215*** (1.635)	4.436*** (1.619)	4.578*** (0.458)	5.482*** (0.466)	4.577*** (0.426)
Government consumption expenditure as % of GDP	-37.15*** (6.398)	-32.26*** (6.154)	-40.57*** (6.185)	-40.32*** (3.810)	-31.31*** (5.298)	-39.42*** (4.440)	-27.02*** (3.414)	-20.48*** (4.859)	-15.71*** (3.528)	-25.28*** (1.830)	-16.41*** (2.626)	-21.65*** (1.894)
Inflation rate	-0.262*** (0.0261)	-0.335*** (0.0285)	-0.275*** (0.0262)	-0.209*** (0.0183)	-0.237*** (0.0201)	-0.187*** (0.0203)	-0.323*** (0.0271)	-0.338*** (0.0272)	-0.326*** (0.0285)	-0.199*** (0.0108)	-0.225*** (0.0121)	-0.180*** (0.0119)
Terms of trade change	0.0207 (0.0508)	0.00687 (0.0498)	0.0246 (0.0508)	0.0428 (0.0328)	0.0381 (0.0326)	0.0397 (0.0341)	-0.0143 (0.0279)	-0.0148 (0.0277)	-0.00167 (0.0268)	0.0228 (0.0203)	0.0178 (0.0202)	0.0285 (0.0206)
Reversal	1.408 (2.213)	0.200 (2.181)	0.929 (2.133)	-0.941 (2.289)	-0.836 (2.288)	-0.133 (2.261)	-1.126 (2.090)	-0.435 (1.959)	-1.766 (1.735)	1.337 (1.326)	1.804 (1.289)	1.929 (1.458)
Foreign direct investment as % of GDP	0.0102 (0.00739)			0.0235 (0.0555)			0.0136 (0.0555)			-0.00176 (0.00861)		
Old age dependency ratio		-0.300*** (0.0533)			-0.154** (0.0685)			-0.0709* (0.0374)			-0.115*** (0.0252)	
Labor force participation rate			-0.0469 (0.0539)			0.104 (0.0709)			0.798*** (0.0966)			0.220*** (0.0421)
Reversal												
L.Current account as % of GDP	-0.301* (0.164)	-0.301* (0.164)	-0.303* (0.166)	-0.0648* (0.0354)	-0.0648* (0.0354)	-0.0626* (0.0359)	-0.0977 (0.0625)	-0.102 (0.0643)	-0.0875 (0.0616)	-0.0934*** (0.0263)	-0.100*** (0.0262)	-0.0899*** (0.0268)
L.Output gap	0.341 (0.210)	0.341 (0.210)	0.390* (0.230)	0.0359 (0.0346)	0.0359 (0.0346)	0.0376 (0.0351)	0.257* (0.140)	0.265* (0.146)	0.329* (0.132)	0.0491*** (0.0169)	0.0483*** (0.0169)	0.0516** (0.0216)
L.Total reserves growth	-1.298 (1.235)	-1.298 (1.235)	-1.306 (1.285)	-0.504 (0.388)	-0.504 (0.388)	-0.565 (0.401)	-0.121 (0.558)	-0.108 (0.546)	-0.149 (0.575)	-0.310 (0.275)	-0.328 (0.276)	-0.321 (0.280)
L.Real effective exchange rate	0.00784 (0.0596)	0.00784 (0.0596)	0.0275 (0.0728)	-0.0166** (0.00817)	-0.0166** (0.00817)	-0.0160* (0.00829)	-0.0173 (0.0111)	-0.0123 (0.0110)	-0.0210* (0.0121)	-0.0216*** (0.00398)	-0.0211*** (0.00397)	-0.0214*** (0.00399)
L.Trade openness	-2.360 (2.950)	-2.360 (2.950)	-2.040 (3.097)	-3.594* (1.852)	-3.594* (1.852)	-3.475* (1.874)	-4.478 (3.997)	-4.887 (4.131)	-3.874 (4.080)	-1.281 (0.970)	-1.199 (0.971)	-1.213 (0.974)
L.Domestic credit to private sector over GDP	0.0651 (0.0429)	0.0651 (0.0429)	0.0591 (0.0451)	0.00921 (0.00693)	0.00921 (0.00693)	0.00858 (0.00706)	0.00505 (0.00839)	0.00292 (0.00828)	0.00591 (0.00866)	0.00249 (0.00393)	0.00141 (0.00397)	0.00207 (0.00395)
L.US interest rate	0.142 (0.123)	0.142 (0.123)	0.147 (0.133)	0.0281 (0.0362)	0.0281 (0.0362)	0.0320 (0.0359)	0.0313 (0.0895)	-0.0271 (0.0863)	0.0495 (0.0997)	0.0452* (0.0233)	0.0399* (0.0232)	0.0481** (0.0236)
Lambda	-0.530 (1.100)	-0.0398 (1.086)	-0.280 (1.076)	0.458 (1.010)	0.416 (1.010)	0.0991 (1.008)	0.611 (0.984)	0.266 (0.938)	0.964 (0.804)	-0.468 (0.572)	-0.665 (0.555)	-0.682 (0.621)
Wald χ^2	3052.1***	3224.2***	3096.3***	2873.7***	2882.1***	2832.8***	1918.0***	1974.5***	2106.6***	6255.8***	6325.79***	6237.9***
Observations	755	759	754	829	834	796	727	733	710	2311	2326	2260

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.15: Treatment effects model: current account reversals' effect on real economic performance

	Fixed exchange rate regime		Intermediate exchange rate regime		Flexible exchange rate regime		Whole sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Real GDP growth								
Investment as % of GDP	18.99***	18.94***	28.32***	28.37***	30.14***	30.11***	27.91***	27.93***
	(3.365)	(3.376)	(2.241)	(2.238)	(2.587)	(2.590)	(1.292)	(1.292)
Trade openness	1.066**	1.070**	11.05***	11.02***	7.556***	7.563***	4.571***	4.572***
	(0.430)	(0.431)	(0.939)	(0.937)	(1.605)	(1.606)	(0.423)	(0.423)
Government consumption expenditure as % of GDP	-38.80***	-38.83***	-39.66***	-39.71***	-27.11***	-27.10***	-25.25***	-25.28***
	(6.245)	(6.260)	(3.802)	(3.796)	(3.392)	(3.393)	(1.798)	(1.798)
Inflation rate	-0.261***	-0.261***	-0.216***	-0.216***	-0.325***	-0.325***	-0.199***	-0.199***
	(0.0259)	(0.0260)	(0.0177)	(0.0177)	(0.0265)	(0.0266)	(0.0108)	(0.0108)
Terms of trade change	0.0174	0.0175	0.0407	0.0399	-0.0123	-0.0117	0.0228	0.0222
	(0.0509)	(0.0510)	(0.0327)	(0.0326)	(0.0277)	(0.0278)	(0.0202)	(0.0202)
Reversal	2.441	3.037	-0.709	-0.187	-1.038	-1.140	1.284	1.527
	(2.807)	(3.201)	(2.298)	(2.339)	(2.070)	(2.105)	(1.394)	(1.408)
L.Reversal		-0.315		-0.695		0.162		-0.351
		(0.813)		(0.533)		(0.651)		(0.351)
Reversal								
L.Current account as % of GDP	-0.378	-0.378	-0.0648*	-0.0648*	-0.0977	-0.0977	-0.0921***	-0.0921***
	(0.233)	(0.233)	(0.0354)	(0.0354)	(0.0625)	(0.0625)	(0.0267)	(0.0267)
L.Output gap	0.252	0.252	0.0359	0.0359	0.257*	0.257*	0.0442***	0.0442***
	(0.282)	(0.282)	(0.0346)	(0.0346)	(0.140)	(0.140)	(0.0168)	(0.0168)
L.Total reserves growth	-1.547	-1.547	-0.504	-0.504	-0.121	-0.121	-0.332	-0.332
	(1.580)	(1.580)	(0.388)	(0.388)	(0.558)	(0.558)	(0.280)	(0.280)
L.Real effective exchange rate	-0.0256	-0.0256	-0.0166**	-0.0166**	-0.0173	-0.0173	-0.0199***	-0.0199***
	(0.0757)	(0.0757)	(0.00817)	(0.00817)	(0.0111)	(0.0111)	(0.00414)	(0.00414)
L.Trade openness	-2.563	-2.563	-3.594*	-3.594*	-4.478	-4.478	-1.776*	-1.776*
	(3.273)	(3.273)	(1.852)	(1.852)	(3.997)	(3.997)	(1.072)	(1.072)
L.Domestic credit to private sector over GDP	0.0569	0.0569	0.00921	0.00921	0.00505	0.00505	0.00163	0.00163
	(0.0502)	(0.0502)	(0.00693)	(0.00693)	(0.00839)	(0.00839)	(0.00408)	(0.00408)
L.US interest rate	0.0451	0.0451	0.0281	0.0281	0.0313	0.0313	0.0455*	0.0455*
	(0.153)	(0.153)	(0.0362)	(0.0362)	(0.0895)	(0.0895)	(0.0242)	(0.0242)
hazard lambda	-1.031	-1.344	0.359	0.112	0.567	0.620	-0.438	-0.551
	(1.383)	(1.592)	(1.014)	(1.035)	(0.974)	(0.994)	(0.602)	(0.609)
Wald χ^2	3036.16***	3017.13***	2862.62***	2877.95***	1952.87***	1951.37***	6279.25***	6270.62***
Observations	759	759	834	834	733	733	2326	2326

Standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
The dependent variable is equal to 1 only if the current account is lower than 2% of GDP.

Table A.16: Random effects models: current account reversals'effect on real economic performance

	Fixed exchange rate regime (1)	Intermediate exchange rate regime (2)	Flexible exchange rate regime (3)	Whole sample (4)
Investment as % of GDP	19.27***	14.31***	15.85***	13.63***
	(3.054)	(2.811)	(2.962)	(1.578)
Trade openness	0.645	4.855***	4.285***	2.265***
	(0.423)	(0.876)	(1.271)	(0.392)
Government consumption expenditure as % of GDP	-33.54***	-40.23***	-33.18***	-43.19***
	(4.843)	(3.870)	(4.959)	(2.393)
Inflation rate	-0.194***	-0.182***	-0.189***	-0.156***
	(0.0228)	(0.0171)	(0.0207)	(0.00918)
Terms of trade change	0.108***	-0.0171	-0.0414	-0.00764
	(0.0379)	(0.0318)	(0.0254)	(0.0180)
Reversal	-0.779	0.221	-0.100	0.125
	(0.670)	(0.556)	(0.583)	(0.344)
R^2	0.27	0.13	0.08	0.13
Wald χ^2	171.57***	256.19***	206.95***	644.36***
Observations	880	1183	905	2968

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.17: Country fixed effects models: current account reversals'effect on real economic performance

	Fixed exchange rate regime (1)	Intermediate exchange rate regime (2)	Flexible exchange rate regime (3)	Whole sample (4)
Investment as % of GDP	19.57***	17.35***	17.64***	13.81***
	(3.173)	(3.002)	(3.265)	(1.597)
Trade openness	0.414	6.572***	5.641***	2.215***
	(0.448)	(1.082)	(1.586)	(0.439)
Government consumption expenditure as % of GDP	-36.30***	-54.31***	-48.59***	-50.59***
	(5.813)	(4.601)	(6.020)	(2.603)
Inflation rate	-0.203***	-0.196***	-0.213***	-0.166***
	(0.0232)	(0.0175)	(0.0231)	(0.00925)
Terms of trade change	0.110***	-0.0153	-0.0406	-0.00841
	(0.0380)	(0.0313)	(0.0249)	(0.0179)
Reversal	-0.777	0.242	-0.172	0.133
	(0.671)	(0.548)	(0.569)	(0.341)
R^2	0.26	0.13	0.08	0.12
F	26.05***	49.38***	43.09***	116.30***
Observations	880	1183	905	2968

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.