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Currency Misalignments in emerging and developing countries: reassessing the role of Exchange Rate Regimes*

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Abstract

This paper re-examines empirically the relationship between exchange rate regimes and currency misalignments in emerging and developing countries. Using alternative *de facto* exchange rate regime classifications over the period 1980-2012, it finds strong evidence that performance of exchange rate regimes is conditional on the *de facto* classification. In particular, this paper shows that the effect of monetary arrangements on currency misalignments depends critically on the ability of these classification schemes to capture adequately dysfunctional monetary regimes.

Keywords: Currency misalignments; Exchange rate regimes; Emerging and developing countries.

JEL Classification: C23, F31, F33.

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1 Introduction

Since the last decades, the macroeconomic policy framework in emerging and developing countries has involved a certain set of features: financial crises in the 1990s and early 2000s (e.g. Mexico 1994–5, East Asia 1997–9, Russia and Brazil in the late 1990s, Argentina 2002), and more recently greater dispersion in net foreign asset positions, with several countries exhibiting accumulation of large foreign exchange reserves or emerging as net debtors (Lane and Milesi-Ferretti, 2002).

The financial crises made apparent that macroeconomic and financial instability in the hit countries had been driven in part by sustained departures of real exchange rates from their equilibrium value[1] and underlined the importance of avoiding such currency misalignments. More recently, concerns about unsustainable current account imbalances have again prompted calls to redirect macroeconomic policy towards correcting exchange rate misalignments (Blanchard and Milesi-Ferretti, 2011).

One of the critical questions associated with this issue is which monetary regime offers a better insulation to such currency misalignments. Classical models of international monetary transmission usually argue in favor of floating exchange rate regimes. Indeed, in these models, exchange rate movements act as a substitute for product price flexibility in fostering international relative price adjustment vis-à-vis macroeconomic shocks, in accordance with the adjustment mechanism presented by Friedman (1953). However, models based on what has started to be known as the "New Open Economy Macroeconomics" have challenged this classical view. For relative price adjustment via exchange rate to be efficient, a high pass-through on import prices and complete financial markets are required. As these assumptions are likely to be not fully met, a free float does not necessarily lead to efficient levels of exchange rates (Corsetti et al., 2010; Berka et al., 2012).

On the empirical side, the role of the exchange rate regime on currency misalignments has not been intensively studied and furthermore no consensus emerges from the studies dealing with this issue. Dubas (2009) derives a measure of misalignments from the estimation of a cointegrating relationship between the real effective exchange rate and a set of standard fundamentals (terms of trade, productivity, openness, government consumption, capital flows, and excess credit) and regresses it on the exchange

[1]The main arguments are the following. First, keeping the RER at the wrong levels may create distortions in the relative price of traded to non-traded goods, thus, leading to sub-optimal allocation of resources across sectors and result to greater economic instability (Edwards, 1989). Second, as currency misalignments arise from no-sustainable macroeconomic policies, they can lead to unsustainable pressure on the exchange rate and currency crises (Kaminsky et al., 1998; Goldfajn and Valdes, 1998).

rate regime (ERR). Using data on 102 countries and the official International Monetary Fund (IMF) classification (the *de jure* regime) over the post-Bretton Woods era, he finds that fixed ERR perform better than flexible ERR, but that currency misalignments are weaker in countries with intermediate ERR. Caputo (2015) examines whether the nature of a country's nominal exchange rate regime significantly affects the adjustment process of the real exchange rate toward its equilibrium level. Using data on 54 countries (developed and developing economies) over the 1980-2011 period and the *de facto* classification scheme of Shambaugh (2004), he finds that real exchange rates of developing countries in floating regimes exhibit significantly greater mean reversion — i.e. lower currency misalignments — than in fixed regimes. But, as these two analyses ignore the issue of regime classification in their empirical strategy, their findings are not necessarily robust. This is particularly true with regard to Caputo's finding. Indeed, using different *de facto* classifications of exchange rate regimes, Chinn and Wei (2013) show that, on average, real exchange rates in floating regimes do not appear to exhibit significantly greater mean reversion than in fixed regimes. Thus, omitting the issue of regime classification makes impossible to know whether results are driven by genuine differences in performance across regimes or simply reflect idiosyncrasies in the classification schemes.

In fact, there is a strand of empirical research that typically examines the differences across classification schemes on the performance of exchange rate regimes.[2] Indeed, it is now well recognized that classifications of exchange rate regimes differ from one another, not only in terms of cross-countries and time coverage but also in terms of classification schemes. The most notable difference is that between the *de jure* classification based on officially announced exchange rate regimes and the *de facto* classifications based on exchange rates followed in practice (Calvo and Reinhart, 2002; Levy-Yeyati et al., 2013).[3] But, there are also disagreements across the *de facto* systems (see Klein and Shambaugh, 2006 for an extensive discussion). Consequently differences in the way to measure monetary regimes lead to different result across classifications, so that it is often not possible to conclude with certainty that one exchange rate regime performs better than others (Rose, 2011).

In this paper, we question the presumed performance of exchange rate regimes by

[2]See, for example, Gosh et al. (2014) on current imbalances; Klein and Shambaugh (2008) on exchange rate stability; Aghion et al. (2009) on productivity growth; and Rose (2011) on inflation.

[3]Explanations on the sources of this discrepancy include the "fear of floating", i.e. recurrent *de facto* exchange rate intervention in officially floating regimes in order to avoid a depreciation of the currency (Calvo and Reinhart, 2002) and more recently the "fear of appreciation" (Levy-Yeyati et al., 2013), i.e. interventions in Forex markets to keep the currency undervalued.

re-examining empirically the relationship between exchange rate regimes and currency misalignments. Like the previously mentioned studies, we seek to determine which ERR category performs the best in minimizing such currency misalignments in developing and emerging economies. But, we also address the problem of differences across classifications schemes omitted by this literature. Exchange rate regimes are defined according to the two well-established *de facto* ERR classifications: *(i)* the "natural" classification proposed by Reinhart and Rogoff (2004, thereafter RR), and *(ii)* the classification of Levy-Yeyati and Sturzenegger (2003, thereafter LYS). In order to ensure that our results are robust, we perform additional checks, including controlling for differences in cross-country and time coverage, for alternative assessments of currency misalignments and by addressing two main methodological issues that are usually discussed in the literature, the omitted variable bias and the simultaneity bias. Finally we examine the nature of differences across *de facto* classifications to determine how they affect the performance of exchange rate regimes in terms of currency misalignments.

Using data on 73 developing and emerging countries over the period 1980-2012, our analysis fails to establish any robust relationship between currency misalignments and exchange rate regimes. More specifically, the fixed exchange rate regime seems to be associated with lower currency misalignments but only when using the RR classification and for developing countries. This result holds up under a variety of standard robustness tests. However, it is no longer valid when idiosyncratic (country-year) observations of the RR classification are excluded. Our findings thus provide strong evidence that the implications of the exchange rate regime on currency misalignments is conditional on the *de facto* classification. In particular, the effect of exchange rate regimes on currency misalignments depends critically on the ability of these classification schemes to capture adequately dysfunctional monetary regimes.

In what follows, section 2 outlines our empirical framework —i.e. methodology and data. Sections 3 and 4 present the estimation results and the sensitivity analysis. In section 5, we provide evidence about the role played by differences across classification schemes in determining performances across exchange rate regimes. Finally, Section 6 concludes.

2 Empirical framework

2.1 Equilibrium exchange rate and currency misalignments

The currency misalignment usually refers to a prolonged departure of the actual real exchange rate from its equilibrium level. This latter level is typically assessed on the basis of a particular equilibrium exchange rate approach.[4] In this paper, we use the Behavioral Equilibrium Exchange Rate (BEER; see Clark and MacDonald, 1998) approach. This approach consists in assessing the equilibrium level of the real exchange rates through an estimated long-run relationship between the observed real exchange rate and a set of *fundamentals*, i.e. variables influencing the real exchange rate in the long run. This set of fundamentals derives from various theoretical models. Among many, the works of Edwards (1988), Elbadawi (1994), Hinkle and Montiel (1999) and Elbadawi and Soto (2008) have provided suitable theoretical frameworks to determine fundamentals that drive the equilibrium real exchange rates of developing and emerging countries. In particular, the terms of trade, the relative productivity of the tradable sector and the net foreign assets position are usually identified as the most influential fundamentals. We follow this literature and estimate the equilibrium level of the real exchange rate on the basis of the following long-run relationship:

$$reer_{i,t} = \mu_i + \beta_1\ tot_{i,t} + \beta_2\ rprod_{i,t} + \beta_3\ nfa_{i,t} + \varepsilon_{i,t} \tag{1}$$

where $i = 1, \ldots, N$ and $t = 1, \ldots, T$ respectively indicate the individual and temporal dimensions of the panel. $reer_{i,t}$ is the real effective exchange rate (in logarithms), an increase in the index indicates a real appreciation; $tot_{i,t}$ is the logarithm of terms of trade, an increase indicates an improvement; $rprod_{i,t}$ stands for the relative productivity of the tradable sector of country i's against its main trading partners (the Balassa-Samuelson effect) also expressed in logarithm; and $nfa_{i,t}$ is the net foreign assets position (in percentage of GDP). μ_i are the country-fixed effects and $\varepsilon_{i,t}$ is an error term. As documented by the existing literature, an improvement in the terms of trade and in the net foreign assets position as well as an increase in the relative productivity of the tradable sector are expected to appreciate in the long run the equilibrium level of the real exchange rate.

The currency misalignments of each country i ($Mis_{i,t}$) are then obtained from the

[4]For further details on equilibrium exchange rates' approaches (e.g. PPP, FEER, DEER, NATREX), see Edwards and Savastano (2000) and Driver and Westaway (2005).

difference between the observed real effective exchange rate ($reer_{i,t}$) and its equilibrium level ($reer^*_{i,t}$) —i.e. the fitted value of the real effective exchange rate derived from the estimation of Equation (1):

$$Mis_{i,t} = reer_{i,t} - reer^*_{i,t} \tag{2}$$

Following this definition and the definition of the real effective exchange rate, a negative sign indicates an undervaluation (i.e. $reer_{i,t} < reer^*_{i,t}$) whereas a positive sign indicates an overvaluation (i.e. $reer_{i,t} > reer^*_{i,t}$) of the real effective exchange rate.

2.2 Assessing the effects of exchange rate regimes

We then explore, for developing and emerging countries, whether one ERR category performs better than the others in limiting currency misalignments. To the extent that real undervaluations and overvaluations might compensate each other, we focus on the absolute values of currency misalignments. Then, we define dummy variables to capture the effect of the various regime categories. To avoid multicollinearity, we exclude one category which is thus considered as the reference regime. Adopting this approach, the equation of interest can be specified as follows:

$$|Mis_{i,t}| \;=\; \mu_i \;+\; \eta_t \;+\; \Phi_j \sum_{j=1}^{m-1} Dum_j * ERR_{i,t} \;+ \beta_i \; X_{i,t} \;+\; u_{i,t} \tag{3}$$

where $|Mis_{i,t}|$ is the absolute value of currency misalignment; Dum_j is a dummy variable scoring 1 for regime$j$ (0 otherwise); m is the number of regimes category considered in the exchange rate regime classification $ERR_{i,t}$ and $X_{i,t}$ is is a set of control variables. μ_i and η_t represent the country fixed effects and the year fixed effects. $u_{i,t}$ is an independent and identically distributed error term.

In estimating Equation (3), we control for crises and financial openness. Indeed, as these variables can act as other possible determinants of currency misalignments, ignoring them could lead to a misspecification of our empirical model. Controlling for crises is particularly important to avoid biased estimates as crises are generally associated with considerable changes in exchange rates. No less importantly, we also take into account the openness in capital account transactions since the removal of capital controls may expose countries to massive inflows and outflows which usually translate into important exchange rates' variations.

Furthermore, as exchange rate regimes' performance might be affected by several characteristics, such as financial development and openness, that differ between emerging and developing economies, we also estimate Equation (3) by considering separately these two groups of countries. Finally, since countries that have maintained their exchange rate regime during the period under consideration may bias our results, we also consider a subsample (panel B) which excludes those countries.[5]

2.3 Data: key variables

The first set of data required covers data needed for the estimation of the equilibrium exchange rates and assessments of the currency misalignments. These data have been compiled from different sources. Real effective exchange rate (REER) statistics are provided by the Bruegel's database and correspond to the weighted average of real bilateral exchange rate against 67 trade partners. We use the same weights and trade partners for the calculation of the relative productivity, proxied here by the relative real GDP per capita (in PPP terms).[6] The terms of trade series are taken from the WDI database (World Development Indicators, World Bank). The net foreign asset positions are extracted from the Lane and Milesi-Ferretti (2007) database and updated using information provided by IFS (*International Financial Statistics*, IMF). All the series are in logarithms, except the net external positions which are expressed as share of GDP.

The exchange rate regime variables come from the two traditional *de facto* classifications, i.e. the Reinhart and Rogoff (2004; thereafter RR) "Natural" classification and the Levy-Yeyati and Sturzenegger (2003; thereafter LYS) classification. We opt to work with both classification schemes as they have much disagreement over how to classify a given country in a given year. Indeed, the LYS classification relies on a cluster analysis based on country–year changes in the exchange rate, in the rate of change of the exchange rate and in official reserves. The RR classification also relies on exchange rate's variations, but these are based on monthly observations and averaged over five-year rolling windows. Moreover, this classification takes into account, as indicator of the underlying monetary policy, the existence of non-unified exchange rate markets (multiple exchange rates and parallel markets), instead of the behavior of foreign exchange

[5]The full sample (Panel A) includes long lasting exchange rate regimes. However, the fact that exchange rate policies do not vary over time in several groups of countries (as the former French colonies, OPEC members, small financial centers, etc...) may bias our results. We then drop these observations in Panel B to avoid such bias.

[6]Due to a lack of available data at the sectoral level, PPP GDP per capita are usually used to approximate the relative productivity differentials between sectors and countries.

reserves. The RR (coarse) index range from 1 to 6, from more to less fixity, while the LYS index ranges from 1 to 5, from less to more fixity. We also use a more usual typology —the coarser official classification—, by collapsing the regime categories listed by each classification into three broader categories: fixed, intermediate, and flexible ERR.[7] Both six- and three-way RR classifications cover the 1980-2012 period while the LYS classifications cover the 1980-2004 period.[8]

Regarding control variables, we construct a *Crisis* dummy variable —that scores 1 for crisis years; 0 otherwise— based on data from Laeven and Valencia (2012). We restrict the cases of crisis to systemic banking, currency and sovereign debt crises. The proxy for financial openness is the Chinn-Ito *KAOPEN* index (Chinn and Ito, 2008), which is measured on a scale from 0 to 1; 1 being the highest financial openness degree.[9]

Finally, our panel consists of 73 countries classified as developing and emerging countries.[10] All data are annual and cover the period 1980-2012 —1980-2004 when using the LYS classification.[11]

3 Results

3.1 Assessing currency misalignments

To estimate the cointegrating relationship between the real effective exchange rate and its fundamentals (Equation 1), we use the Cross-sectionally augmented Pooled Mean Group (CPMG) estimator[12] which corrects the Pooled Mean Group (PMG) estimator (Pesaran, 2006) for cross-sectional dependencies. Like the PMG, the CPMG allows the short-run dynamic to differ from country to country while constraining the long-run coefficients to be the same (Binder and Offermanns, 2007). Thus this approach leads to correct inference and consistent estimates in presence of cross-sectional dependen-

[7]The category "1" in the LYS classification corresponds to inconclusive determination. This latter category exists only in the 5-way classification.

[8]We extend/fill the gaps in the RR classification using Ilzetzki, Reinhart and Rogoff (2011) and various issues of the *Annual Report on Exchange Rate Arrangements and Exchange Restrictions* (IMF). The details regarding the RR and LYS classifications are reported in Tables A.3 and A.4 —Appendix A.

[9]We focus only on these two control variables (Crisis and financial openness) to minimize endogeneity and simultaneity problems.

[10]See Table A.2. for the list of countries. We have followed the IMF classification, as Gosh et al. (2014).

[11]The sources and definitions of the data are provided in Appendix A.1.

[12]Even if the CPMG estimator can deal with both I(0) and I(1) variables, we performed unit root and cointegration tests. The results —not reported here to save space but available upon request— indicate that all series are I(1) and cointegrated.

cies and better captures heterogeneity across countries —compared to the DOLS and FMOLS procedures. Table 1 presents the CPMG estimates as well as the Hausman Chi-square test statistic which examines the null hypothesis of the homogeneity in the long-run coefficients.

Table 1 — Estimation of the long-run relationship

Long-run dynamic			***Short-run dynamic***		
	Coef.	Z		Coef.	Z
$rprod$	0.332***	7.28	$\Delta rprod$	-0.026	-0.23
tot	0.141***	3.82	Δtot	-0.075	-1.53
nfa	0.231***	7.44	Δnfa	0.198***	5.17
$L.\overline{reer}$	0.622***	4.31	$\Delta\overline{reer}$	0.261***	3.38
$\overline{rprod}$	-0.438***	-4.00	$\Delta\overline{rprod}$	0.077	1.62
$\overline{tot}$	0.673***	3.18	$\Delta\overline{tot}$	-0.081	-0.91
$\overline{nfa}$	0.040	0.83	$\Delta\overline{nfa}$	0.021	0.62
			$ec.$	-0.188***	-8.43
			$Constant$	-0.493***	-8.21
Specification test				11.43	
Joint Hausman test [a]				[$p.value$=0.12]	
No. Countries / No. Observations:				73 / 2360	

Notes: Symbols ***, **, and * denote significance at 1%, 5%, and at 10%. "Δ" (resp. "$L.$") is the difference operator (resp. the lag operator); "$ec.$" is the error correction term. The bars over the variables indicate the cross-sectional averages of these variables.
a: Null of long-run homogeneity

According to the Hausman test, the long-run homogeneity restriction is not rejected for individual parameters and jointly in all regressions. The CPMG estimates are thus consistent and efficient (see Cavalcanti et al. 2012). The estimated coefficients are statistically significant and have the expected positive signs: the real effective exchange rate appreciates in the long run with the increase in the relative productivity per capita, the improvement in the terms of trade and in the net foreign assets position.

The equilibrium exchange rates ($reer^*_{i,t}$) are derived by applying the permanent components of the fundamentals (estimated with the Hodrick-Prescott filter) in the estimated cointegrating relationship. Currency misalignments are then calculated as the difference between the observed real effective exchange rates and their equilibrium value, as indicated by Equation (2).[13]

[13]Figures C.1 and C.2 in Appendix C display the evolution of observed and equilibrium real effective exchange rates and the associated misalignments.

3.2 Exchange rate regimes and currency misalignments

Tables 2 and 3 present the results derived from the estimation of Equation (3), based respectively on the RR and LYS classifications. Flexible regimes are the excluded category, so that the coefficients on fixed and intermediate regimes must be interpreted as the misalignments' differential relative to the flexible exchange rate regime. If one regime category is associated with lower currency misalignments, then the coefficient on the exchange rate regime (Φ_j in Equation 3) should be negative and statistically significant.

In Table 2, the RR classification is used to categorize the different regimes. The estimation results of Equation (3) for the full sample are presented in the first two columns. The estimated effect on misalignments is significant and negative under the fixed regime and becomes insignificant as the regime gets progressively more flexible. Thus, compared to the flexible ERR, the fixed ERR seems to be associated with lower currency misalignments. In particular, the estimated coefficient, around -0.15, suggests misalignments 15 percentage points lower in the fixed ERR compared to the flexible one. In contrast, the intermediate ERR is not significantly different from the flexible regime (for both panels A and B). A closer look at differences between the two subsamples (DCs and $EMEs$) shows that the coefficient of the intermediate ERR, for the DCs group, becomes significant and negative, meaning lower currency misalignments associated with this ERR —compared to the flexible ERR (13 percentage points lower on average). The coefficient is however only significant at 10%. Thus, for the DCs group, the fixed ERR seems to perform the best, followed by the intermediate ERR, comparatively to the flexible ERR. Turning now to the EMEs group, none of the coefficients associated with the ERRs are statistically significant. It seems therefore that, for these countries, the three ERR categories do not differ significantly in terms of currency misalignments.

Turning now to the RR six-way classification, only the regime 2 (coded as a fixed exchange rate regime) —which includes "Pre announced and *de facto* crawling peg"; and "Pre announced and *de facto* crawling band (narrower than or equal to +/-2%)" — exhibits, for the full sample, a negative and significant coefficient —although not very robust. Thus, considering the six-way classification and the full sample, no ERR seems to perform better than the others in terms of currency misalignments. For the DCs, the picture is however different. Indeed, regimes 1 and 2 (both coded as fixed ERR in the three-way classification) as well as regime 3 (coded as an intermediate ERR) exhibit negative and significant coefficients. This last finding therefore confirms the general

pattern obtained from the three-way classification: in developing countries, the more rigid the regime is, the lower the misalignment levels seem. In contrast, for the EMEs group, the exchange rate regime still doesn't seem to matter.

To check if our results are conditional to the measure of *de facto* regimes, Table 3 reports the results derived from the LYS classification. When the three-way classification is used, none of the coefficients associated with the ERRs are statistically significant. In other words, there are no statistically significant differences across exchange rate regimes. The five-way classification leads to similar results. Indeed, when considering the whole sample or the EMEs group, we still not find any significant relationship between currency misalignments and exchange rate regimes. For the DCs group, the coefficient associated with the regime 3 (LYS 3: "dirty float") is, however, significant and positive (around 0.07), showing that this regime is associated, on average, with misalignments 7 percentage points higher than those in the flexible regime.

Finally, regarding the control variables, similar results between the two *de facto* classifications are obtained for the variable $Crisis$. The coefficient is statistically significant —except for the EMEs subsample— and is associated, as expected, with increased currency misalignments. The coefficient associated with the $KAOPEN$ index is not significant in the RR classification, regardless of the considered sample. In contrast, when the LYS classification is used, the coefficient becomes significant and negative for the DCs group. The difference found for the variable $KAOPEN$ between the RR and LYS classifications is not surprising since, according to Reinhart and Rogoff, (2004), one consequence of the use of the parallel market rate is that their classification already includes a measure of capital mobility.

Overall, our results suggest that there is no robust relationship between currency misalignments and exchange rate regimes. The RR classification (three-way) barely suggests that fixed ERR perform the best in limiting currency misalignments —at least in developing countries, but this finding is not confirmed when the LYS classification is used. In contrast, for the EMEs group, the two classification lead to the same result the ERR choice does not seem to matter at all.[14]

[14]The finding that the disagreements among the ERR classifications are more prevalent in DCs is also found by Eichengreen and Razo-Garcia (2013).

Table 2 — Currency misalignments and exchange rate regimes (*RR classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Six-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	1.1	1.2	1.3	1.4	1.5	1.6		1.7	1.8	1.9	1.10	1.11	1.12
ERR													
Fixed	-0.159**	-0.135*	-0.165**	-0.161**	-0.105	-0.089	*RR* 1	-0.103	-0.092	-0.258**	-0.291**	0.234	0.268
	(-2.12)	(-1.79)	(-2.04)	(-2.00)	(-0.66)	(-0.49)		(-1.17)	(-0.79)	(-1.96)	(-2.12)	(0.72)	(0.72)
Interm.	0.094	0.111	-0.127*	-0.131*	0.389	0.397	*RR* 2	-0.212*	-0.203*	-0.223*	-0.248*	-0.304	-0.286
	(0.52)	(0.53)	(-1.80)	(-1.68)	(0.90)	(0.88)		(-1.89)	(-1.82)	(-1.66)	(-1.74)	(-0.96)	(-0.89)
Flexible	—	—	—	—	—	—	*RR* 3	0.080	0.082	-0.197*	-0.233*	0.489	0.528
								(0.40)	(0.36)	(-1.64)	(-1.75)	(0.94)	(0.93)
							RR 4	-0.041	-0.104	-0.179	-0.313	0.667	0.782
								(-0.29)	(-0.59)	(-1.01)	(-1.40)	(0.92)	(0.91)
							RR 5	—	—	—	—	—	—
							RR 6	-0.102	-0.147	-0.132	-0.197	0.614	0.746
								(-0.82)	(-0.82)	(-093)	(-1.11)	(0.91)	(0.92)
Control variables													
Crisis	0.058**	0.060*	0.050**	0.057*	0.091	0.085		0.056**	0.055	0.046**	0.048	0.112	0.111
	(2.24)	(1.64)	(2.23)	(1.72)	(0.94)	(0.77)		(2.14)	(1.54)	(2.08)	(1.52)	(1.08)	(0.97)
kaopen	-0.260	-0.261	-0.028	-0.061	-0.548	-0.614		-0.252	-0.253	-0.022	-0.031	-0.484	-0.514
	(-0.99)	(-0.99)	(-0.56)	(-0.73)	(-0.92)	(-0.88)		(-0.98)	(-0.98)	(-0.47)	(-0.49)	(-0.87)	(-0.82)
Constant	0.713***	0.801***	0.485***	0.452***	1.133**	1.284**		0.697***	0.807***	0.562***	0.557***	1.014**	1.156**
	(3.37)	(3.13)	(7.82)	(8.00)	(2.09)	(2.11)		(4.11)	(3.64)	(5.40)	(5.69)	(2.41)	(2.41)
R-Sq.	0.04	0.05	0.10	0.15	0.08	0.09		0.04	0.05	0.12	0.19	0.09	0.09
Obs./ Countries	2366/73	1398/43	1580/49	777/24	786/24	621/19		2366/73	1398/43	1580/49	777/24	786/24	621/19

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table 3 — Currency misalignments and exchange rate regimes (*LYS classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Five-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	2.1	2.2	2.3	2.4	2.5	2.6		2.7	2.8	2.9	2.10	2.11	2.12
ERR													
Flexible	—	—	—	—	—	—	*LYS* 1	-0.007	-0.007	-0.014	-0.013	-0.501	-0.503
								(-0.10)	(-0.09)	(-0.41)	(-0.38)	(-1.54)	(-1.53)
Interm.	0.043	0.041	0.011	0.010	0.037	0.022	*LYS* 2	—	—	—	—	—	—
	(0.70)	(0.68)	(0.37)	(0.34)	(0.30)	(0.20)							
Fixed	0.301	0.296	-0.014	-0.015	1.070	1.071	*LYS* 3	0.121	0.117	0.070**	0.068**	0.099	0.083
	(0.98)	(0.99)	(-0.46)	(-0.50)	(1.05)	(1.05)		(1.10)	(1.09)	(2.18)	(2.15)	(0.56)	(0.51)
							LYS 4	4E-4	-0.002	-0.021	-0.021	0.013	4E-4
								(0.01)	(-0.04)	(-0.57)	(-0.58)	(0.12)	(0.00)
							LYS 5	0.305	0.301	-0.006	-0.007	1.076	1.077
								(0.99)	(1.00)	(-0.20)	(-0.24)	(1.05)	(1.05)
Control variables													
Crisis	0.095*	0.100*	0.059*	0.063*	0.123	0.169		0.087*	0.092*	0.053*	0.056*	0.117	0.164
	(1.84)	(1.79)	(1.84)	(1.84)	(1.05)	(1.09)		(1.83)	(1.78)	(1.67)	(1.67)	(1.04)	(1.09)
kaopen	-0.019	0.009	-0.135*	-0.123*	-0.101	-0.108		-0.014	0.013	-0.123*	-0.111*	-0.086	-0.093
	(-0.24)	(0.10)	(-1.96)	(-1.75)	(-0.47)	(-0.46)		(-0.18)	(0.14)	(-1.98)	(-1.75)	(-0.41)	(-0.40)
Constant	0.329**	0.361***	0.358***	0.364***	0.485*	0.640***		0.324**	0.356***	0.348***	0.354***	0.514**	0.673***
	(2.31)	(2.83)	(9.62)	(9.36)	(1.96)	(3.72)		(2.24)	(2.74)	(9.43)	(9.14)	(2.11)	(3.91)
R-Sq.	0.04	0.04	0.09	0.09	0.11	0.11		0.04	0.04	0.10	0.10	0.11	0.12
Obs./ Countries	1376/60	1253/55	920/41	847/38	456/19	406/17		1399/60	1276/55	939/41	866/38	460/19	410/17

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

4 Sensitivity analysis

Methodological limitations may explain in part why any relationship between currency misalignments and exchange rate regimes cannot be reliably determined. To tackle this problem, we conduct a variety of additional tests.

4.1 The sample issue

To assess the importance played by the discordance between the RR and LYS classifications results, we first ensure that our previous findings are not driven by differences between the samples covered by these two classifications. Indeed, the RR classification differs from the LYS classification in terms of cross-country and time coverage. Accordingly, we re-estimate our benchmark specification using the RR classification for the sample of countries and over the shorter period covered by the LYS classification. Results reported in Table B.1 —Appendix B— are similar to those reported in Table 2. This obviously indicates that the discrepancy between the two classifications results is not due to their different datasets.

4.2 The currency misalignment issue

In addition to the sample issue, we now check that our baseline results do not depend on our measure of currency misalignments.

4.2.1 An alternative measure of currency misalignments

Given the degree of uncertainty surrounding empirical estimates of equilibrium exchange rates, we derive new assessments of currency misalignments from an alternative estimation-based approach, the Atheoretical Permanent Equilibrium Exchange Rate (APEER) approach. In this approach a filter (Hodrick-Prescott in our case) is used to obtain the permanent component of the real exchange rate —which is considered as the equilibrium exchange rate. The real exchange rate misalignment is then computed as the deviation of the real exchange rate from its permanent equilibrium level (Driver and Westaway, 2004). Thus, we re-estimate Equation (3) using this new measure of currency misalignments. Results are reported in Tables B.2 (RR classification) and B.3 (LYS classification) —see Appendix B.[15]

[15]Note that we also tried to derive PPP-based currency misalignments —à la Rodrik (2008). No significant effects were observed. This result could stem from the too short time dimension of the analysis. Results are not reported in the paper to save space but are available upon request.

Looking first at the RR three-way classification, we note that, with this new measure of misalignments, results are not much affected for the full sample and for the DCs group. More importantly, the coefficient associated with the fixed ERR in the EMEs group, which was negative but insignificant before, now becomes statistically significant. However, the effect of the fixed ERR in the EMEs (around -0.05) is more than twice lower than that in the DCs (between -0.12 and -0.13). The coefficients associated with the intermediate ERR now display a negative sign in all regressions, but they are still not significant. The results derived from the six-way classification appear slightly different from those reported in Table 2. Indeed, regime 2 is associated with significantly lower misalignments followed by regime 1 then regime 3 for the DCs group. For the EMEs group, only regimes 1 and 2 seem to matter. However, the coefficients associated with these regimes are significant at lower significance levels than before. Overall, the only notable effect is still the one observed for regime 2 —when considering the whole sample and the DCs sample while, for the EMEs group, results again fail to show a clear pattern between the ERR and currency misalignments.

Turning now to the LYS classification, the results in Table B.3 echo those obtained in Table 3. Indeed, looking at the three-way classification, we still not observe any significant relationship between the ERR and currency misalignments. Considering the five-way classification, regime 3 is still the only regime with a significant positive coefficient, which is now significant also for the DCs group and the whole sample. Note however that despite its high significance, the coefficient is still weak, ranging from 0.05 for the whole sample to 0.06 for the DCs subsample.

To sum up, using an alternative measure of currency misalignments does not modify the general patterns noted hitherto.

4.2.2 Asymmetric effects

Exchange rate regimes may have a different effect on currency misalignments depending on whether these latter reflect over- or under-valuations of the real exchange rate. Asymmetric effects may then explain the lack of a strong relationship that we have found between the two variables. To test this hypothesis, we re-estimate Equation (3) by considering alternatively undervaluations and overvaluations as the dependent variable. Results are reported in Tables B.4 (RR classification) and B.5 (LYS classification).

First we notice that the coefficients associated with the fixed exchange regime are no more significant in the RR classification (Table B.4). This suggests that over- or

under-valuations of the real exchange rate are equally distributed across exchange rate regimes listed by this classification. Second, the result derived from the LYS classification that the intermediate ERR is associated with higher currency misalignments in developing countries is confirmed (Table B.5). Then asymmetrical effects matter under this category regime: overvaluations in developing countries are higher under this regime (9 percentage points higher on average) than in the flexible regime. However, these coefficients are only significant at 10%.

Thus, taking into account a potential asymmetrical effect of the ERR on currency misalignments does not fundamentally improve our baseline results.

4.2.3 Outliers

Finally, the effect of the exchange rate regime may be sensitive to the presence of extreme values of currency misalignments. In order to verify that our results, when significant, are not driven by outliers, we re-estimate specification (3) after having winsorised the tails of the distribution of currency misalignments to correct for the highest values.[16] We consider two thresholds: the 99^{th} and 98^{th} percentiles. Results are reported in Tables B.6 (RR classification) and B.7 (LYS classification).[17]

Looking first at the RR classification (Table B.6), we note that the effects of the fixed ERR are qualitatively the same when considering the full sample as well as the DCs group. As expected the coefficients associated with this monetary regime, when excluding the top percentile of currency misalignments, are lower than in Table 2; but they are still negative and significant. Results found for the intermediate regime seem more sensitive to outliers. Indeed, the intermediate regime now displays a negative and significant sign not only when considering the DCs group as in Table 2 but also when considering the full sample. Then, when adjusting for outliers, the average misalignments seem to be far lower in countries classified as intermediate by the RR classification. In the case of the EMEs group, results remain unchanged: in these countries, no exchange rate regime seems to perform better than the others regarding the currency misalignment levels. Looking now at the results derived from the LYS classification (Table B.7), they appear again consistent with those in Table 3: there is no significant relationship between the ERR and currency misalignments, regardless the considered country sample. Then, our

[16] Winsorisation consists in limiting extreme values in the data to a particular percentile to reduce the effect of possibly "spurious" outliers. This strategy is here preferred to data trimming as it does not result in a loss of observations. We here focus on the highest values since currency misalignments are taken in absolute values. As supplementary information, the maximum value of currency misalignment when considering the 99th percentile (resp. 98th percentile) is 255% (resp. 119%).

[17] To save space, we reported only the results of the three-way classifications.

baseline results do not seem to be driven by extreme values of currency misalignments.

4.3 The omitted variable bias: inflation

While our analyses are based on two-way fixed effects models —which control for the possibility that there are omitted variable(s) affecting both the degree of currency misalignments and the choice of the ERR, we now explicitly address this issue. In particular, given that fixed exchange rates can allow countries to record lower inflation rates and that countries with lower inflation rates are also more prone to have smaller currency misalignments, we test whether our estimates are not biased by the omission of the inflation rate. We therefore extend our baseline specification by adding the inflation rate —$inflation$— measured as the log difference in the CPI (Consumer Price Index).

Results, displayed in Tables B.8 (RR classification) and B.9 (LYS classification), indicate that the inclusion of the inflation rate leaves the story largely unchanged. Indeed, results derived from the RR classifications (both three- and six-way) largely resemble those from the estimations in Table 2. $Inflation$ exhibits a positive and significant coefficient only in the Panel B of the DCs group. Looking at the LYS three-way classification, exchange rate regimes still do not display any significant impact on currency misalignments. Interestingly however, when considering the five-way classification and the DCs group, regime 3 has no more a significant positive coefficient. Indeed, the inflation rate in these countries has a significant and positive impact on their currency misalignments, suggesting that their higher currency misalignments are not driven by this ERR regime, but by their higher inflation. Thus, when controlling for the inflation rate, the LYS classification (both three- and five-way) definitely fails to establish any relationship between currency misalignments and exchange rate regimes. Controlling for inflation leaves then the results derived from our benchmark specification unchanged.[18]

4.4 Endogeneity

So far, we have considered the exchange rate regime choice as exogenous with respect to currency misalignments. However, one can reasonably presume a reverse causality between currency misalignments and exchange rate regimes: currency misalignments may be driven by the choice of the exchange rate regime, but this latter may depend itself on currency misalignments. This holds particularly true during crises episodes as

[18]This observation holds true for the OST classification. Similar results are also observed when we split the sample by the inflation's level —i.e. *low inflation* vs. *high inflation*. For brevity, results are available upon request.

countries hit by currency crises usually switch their exchange rate regime. To test the assumption of exogenous exchange rate arrangements, we perform the Wu-Hausman test of exogeneity. Results reported in Table B.10 indicate rejection in almost all cases of the null hypothesis of exogeneity. Then, to address the endogeneity problem, we adopt two approaches. We first substitute in our baseline specification the actual exchange rate regime by the one-year lagged exchange rate regime. The second approach we rely on is a two-stage procedure. In the first stage, we estimate a multinomial probit model.[19] In the second stage, regressions are performed by replacing each ERR dummy by its fitted value derived from the multinomial probit model.

The results of the regressions including the one-year lagged exchange rate regime are reported in Tables B.11 (RR classification) and B.12 (LYS classification). As can be seen, we obtain the same patterns highlighted in Tables 2 and 3. On the one hand, estimates derived from the RR classification barely suggest the same relationship between the ERR and currency misalignments: the higher the fixity of the currency regime, the lower is the currency misalignment. But again statistical significance levels are low, except for the DCs group. On the other hand, when considering the LYS classification, there is still no exchange rate regime displaying a statistically significant impact on currency misalignments.

Looking now at the second approach (Tables B.13 and B.14), we note that our previous findings are robust to the use of predicted ERRs. However, the results based on the RR classification indicate a similar but less significant relationship than before. Looking at the three-way classification, only the coefficients associated with the fixed regime appear significant —at 10% in almost all cases— and negative but again only for the whole sample and the DCs group. For the sample limited to the EMEs group, we find again no remarkable effect of the ERRs. Turning to the six-way classification, results confirm the lower significance level. Except regime 1 (listed as a fixed ERR) —in the DCs group— no monetary regime exerts a noticeable effect. When considering the LYS classification we again fail to discern a strong relationship between exchange rate regimes and currency misalignments. Our results appear therefore robust to the endogeneity problem.

Overall the different results derived from the sensitivity analysis show the robustness of our baseline finding: there is no clear effect of the exchange rate regime on currency

[19]In estimating probit models, we used as regressors the initial foreign reserves (in % of GDP), the GDP in PPP terms, the land area, and a dummy variable for islands (see Levy-Yeyati and Sturzenegger, 2003; Chinn and Wei, 2013). Results of the probit models are not reported to save space but are available upon request.

misalignments[20], as the RR and LYS classifications still lead to the same diverging conclusions.

5 On the discordance between classification schemes

In what follows, we address the issue of the ERR classifications in order to understand the differences between the results obtained with the RR and LYS classifications. More specifically, we investigate whether our results, when significant, reflect significant difference in performance across regimes or simply idiosyncrasies in the classification schemes.

5.1 Alternative exchange rate regime classification

Most empirical studies dealing with exchange rate regimes point that the de facto classifications do not overlap well. They differ from one another, not only in terms of cross-country and time coverage, but also in terms of classification schemes. This lack of agreement occurs mainly because these *de facto* classifications do not agree on what exactly should be understood by the policies underlying each exchange rate regime. Reinhart and Rogoff (2004) provide a classification based upon the black market rate —hence merging both exchange rate choices and capital control choices. The classification developed by Levy-Yeyati and Sturzenegger (2003) accounts for official exchange rate movements as well as exchange market intervention.

To check the issue of classifications schemes, we re-estimate our baseline specification (Equation 3) by using a third classification, the Obstfeld, Shambaugh, and Taylor (2010; thereafter OST) *de facto* classification. Unlike the RR and LYS classifications, the OST classification differentiates the fixed, intermediate and flexible exchange rate regime on the sole basis of the exchange rate volatility. Indeed, this classification is similar in spirit to that used by Shambaugh (2004) in which only two regimes (pegs and non-pegs) are coded.[21] However, the OST classification extends this latter classification by adding a third category —soft pegs— which allows for a wider band of exchange rate movement (up to 5% bands). The three categories —peg, soft peg, and non-peg— being mutually exclusive, this classification fits the usual three-way classification, i.e.

[20]We performed various other robustness analyses (e.g. grouping of countries depending on their trade openness, money supply —M2—;transitory changes in the ERR) and found again no strong relationship between the currency misalignments and the exchange rate regime. Results are not presented here to save space but available upon request.

[21]A peg spell is defined as a situation where, over the course of a calendar year, the month-end bilateral exchange rate with the base country stays within a 2% band.

fixed, intermediate, and flexible ERR. We also use a finer typology based on a seven-way classification, by distinguishing the different sub-regimes associated to the two broader categories —i.e. peg and soft peg.[22] Results of the analysis based on the OST classification are reported in Table B.15 —Appendix B.

Looking first at the three-way classification, we note a clear absence of statistical significance in the misalignments-ERR relationship. No coefficient appears significant, regardless the considered sample. Thus, this finding is similar to the one found with the LYS classification. Turning to the seven-way classification, no regime appears with a significant coefficient, except regimes 4 and 5 —both classified as soft pegs— and only for the DCs group. Nevertheless, the coefficients are weak and only significant at 10%. Moreover, only the result associated with the regime 4 is robust to the considered panel (i.e. A and B). These results tend then to support our previous conclusions. Once again, results, when significant, appear to depend critically on the classification scheme.[23]

5.2 Distribution across regime categories and correlation across classification schemes

As shown by Figure 1, the different views on the *de facto* behavior of exchange rate regime across classification schemes translate into diverging distributions across the fixed, intermediate and flexible regimes.

On average, the LYS classification records many more intermediate regimes than the RR and OST classifications for both developing and emerging countries. This is mainly due to the use of reserve changes which allows this classification to better identify intermediate from floats. The OST classification also leads to a different distribution of ERRs —compared to the RR and LYS classifications— with, on average, a greater share to flexible ERR and a lower share to fixed ERR, for both developing and emerging countries. The latter result may be attributed to the way the OST classification classifies pegged countries. In particular, as this classification focuses on the stability of the peg, it doesn't allow a peg spell to continue if there is a one-time discrete devaluation during a year. Consequently, this classification results, on average, in more frequent non-peg spells and fewer peg spells than the two others classification schemes.

[22] See Table A.5 in Appendix A for the details of the classification. The data cover the 1980-2012 period.

[23] Although our analysis does not take into account all the *de facto* classifications, the use of others *de facto* classifications would lead to more or less similar conclusions due to the correlation between the different classification schemes. This applies especially to the IMF *de facto* classification which has a high degree of consensus with the RR classification. Also, note that we performed all the previous robustness checks for the OST classification. Results —not reported here to save space but available upon request— remain unchanged compared to those in Table B.15.

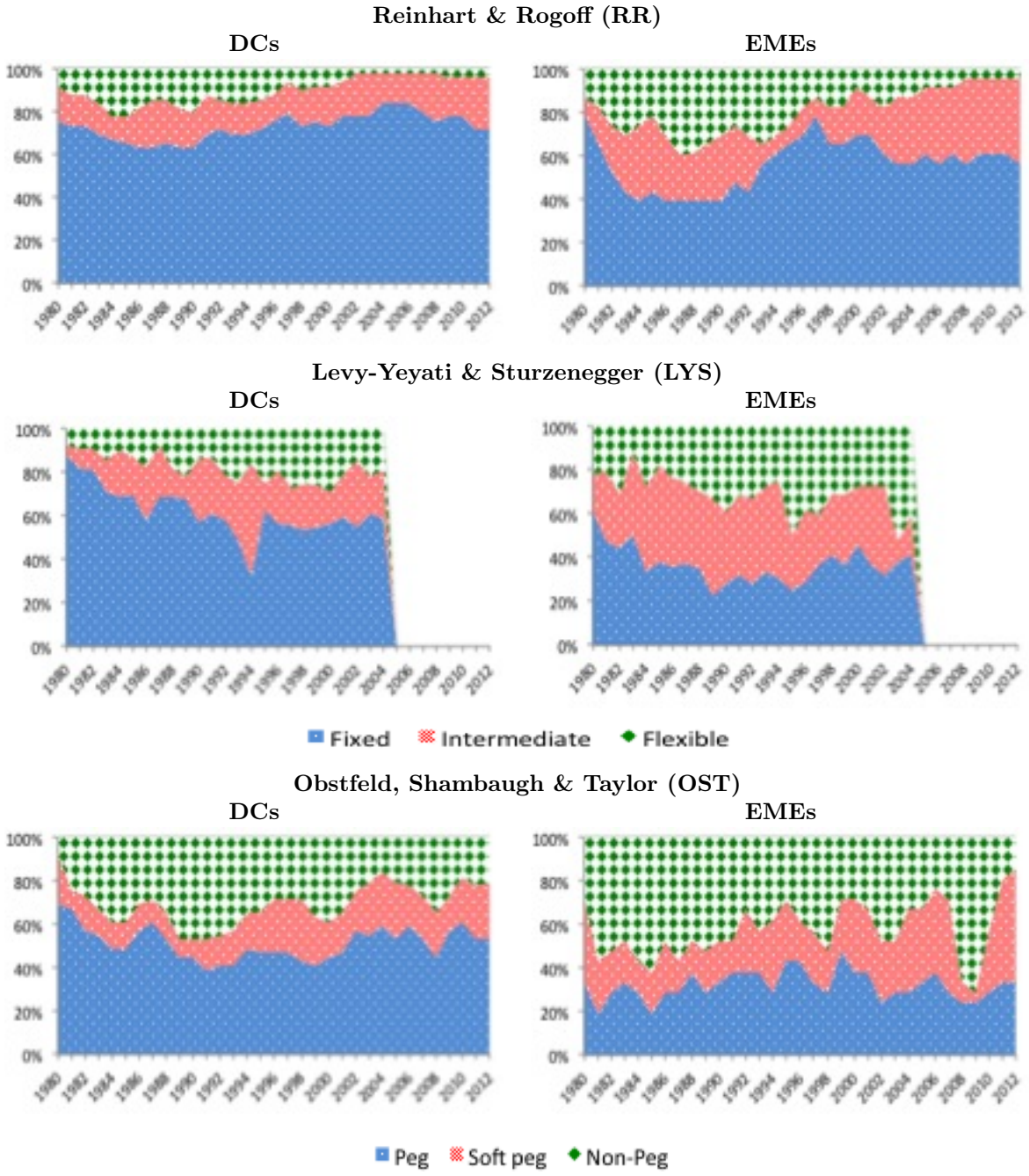

Figure 1 — Three-way *de facto* regime distributions over time (in % of annual observations)

The disagreements can be examined more formally by estimating correlations between the three *de facto* classifications. As can be seen from Table 4, observations differ from one classification to another, but the RR classification appears more idiosyncratic than the others. This means that —on average— for each (country-year) observation, the LYS and OST classifications agree more with each other than with the RR classification —which is consistent with our earlier findings.

Table 4 — ERR classifications correlation matrix

		RR		***LYS***		***OST***	
		Simple	***Weighted***	***Simple***	***Weighted***	***Simple***	***Weighted***
RR	***Simple***	1.0000					
	Weighted		1.0000				
LYS	***Simple***	0.2444		1.0000			
	Weighted		0.20760		1.0000		
OST	***Simple***	0.4966		0.5986		1.0000	
	Weighted		0.4631		0.5556		1.0000

Note: The correlations are in absolute values since the LYS classification ranks the exchange rate regimes from the more to the less flexible regime, unlike the other two classifications. In the weighted correlation, each exchange exchange rate regime is weighted according to its share in total observations.

5.3 Differences across classifications results: identifying the root causes

One reason that could drive the differences between the RR, LYS and OST classification results is that exchange rate regimes performance are examined relatively to the flexible exchange rate regime which is the category for which the results differ most across classification schemes. Figure 2 presents the mean of the currencies misalignments under each regime across classification schemes and country samples.[24]

The figure shows that the RR classification scheme identifies the highest currency misalignments (in absolute value) for the DCs group in the flexible ERR, comparatively to the others classification schemes. These higher values are a consequence of the treatment of dual exchange rate regimes and high inflation episodes in this classification. Indeed, one feature of the RR classification is that countries with inflation rates over 40% are classified as "freely falling" and therefore as countries that have opted for a flexible regime. In particular, the use of dual exchange rate regimes makes a significant number of countries with parallel and shadow exchange rate markets being "freely falling" cases. Consequently, “freely falling” continues to be a significant category —while decreasing comparatively to the figures reported for earlier periods by Reinhart and Rogoff (2004)[25]— accounting for 9 percent of the observations when considering all the regimes and 69 percent when considering the flexible regimes —from 1980-2012 (see Table A.6b in the Appendix).

[24]Figures are derived from statistics reported in table A.7 in the Appendix.

[25]12 percent of all regimes on the 1974 –1990 period, and 13 percent of all regimes on the 1991–2001 period (Reinhart and Rogoff, 2004).

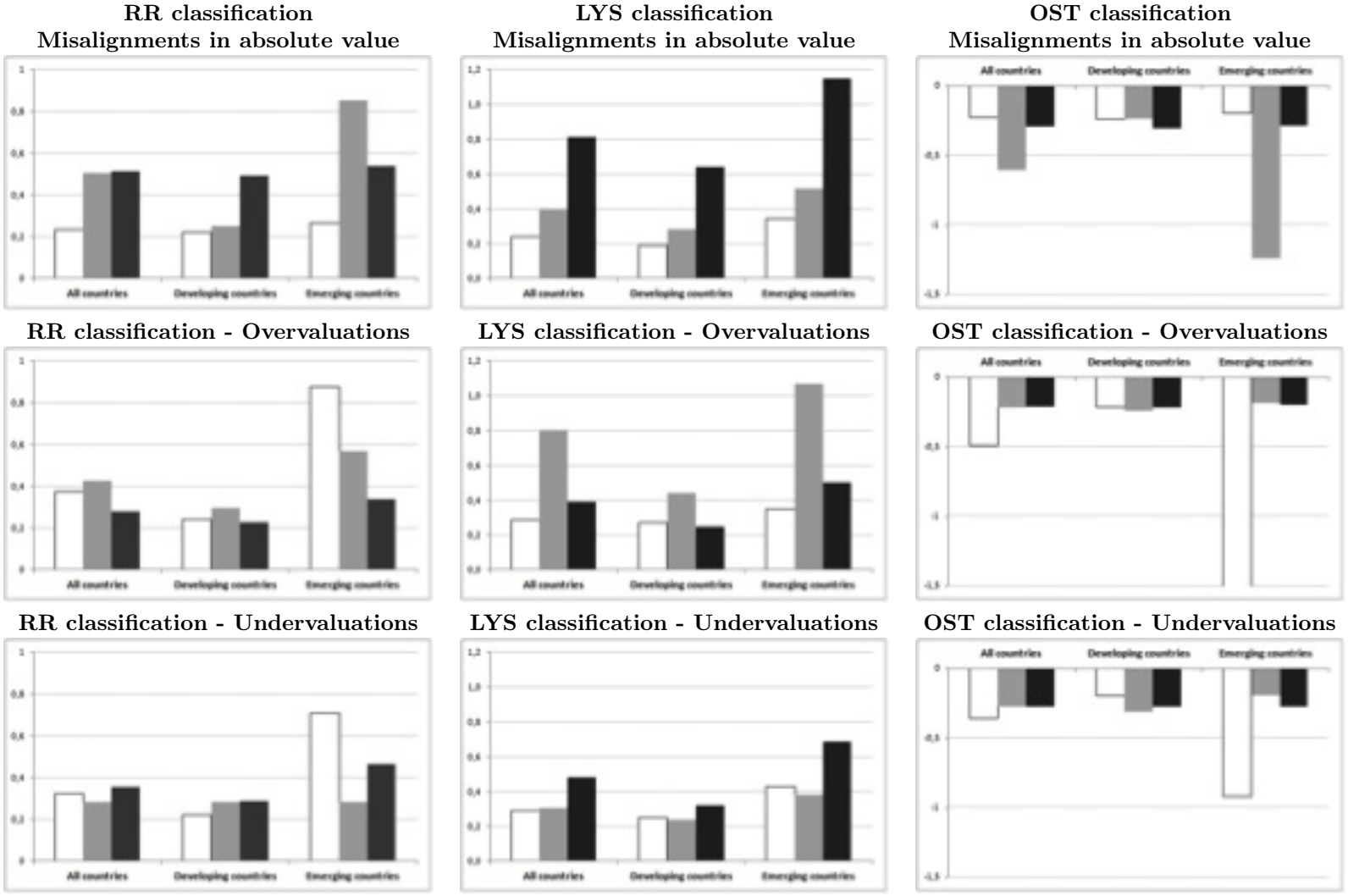

Figure 2 — Mean of misalignments under regime category across classification schemes and country samples

Note: The white bars are the fixed ERR, the light grey bars are the intermediate ERR and the dark grey bars are the flexible ERR.

Countries in the "freely falling" category are characterized by dysfunctional monetary regimes (Reinhart and Rogoff, 2004). They are then more prone to exhibit higher currency misalignments as these latter are fundamentally the symptoms of no-sustainable policies. Indeed, as shown by Figure 2, the RR classification scheme also involves highest real overvaluations in developing countries with the flexible regime, comparatively to the others classification schemes.

To investigate whether these points of disagreements among the three *de facto* classifications drive the differences across their results, we define a "consensus" classification based on the similarities between the RR, LYS, and OST coarser classifications —i.e. when regimes are classified as fixed, intermediate or flexible. Thus, this consensus classification includes only observations for which the three classifications agree. Given the rather small correlations between these classifications, this classification scheme drastically reduces the number of observations, particularly in the intermediate regime which now includes only eight observations. Since statistical inference is not possible for this latter regime, we drop it and consider only two regime categories: fixed vs. flexible regimes. We then perform the previous analyses using this consensus classification. The results presented in Table B.16 suggest the absence of a significant relationship between exchange rate regimes and currency misalignments. In particular, the estimated coefficients of the fixed ERR derived from the RR classification are no longer significant, regardless the specification and the considered subsamples. This result clearly indicates that the points of disagreements among the three *de facto* classifications can be explained by their different views on the *de facto* behavior of exchange rate regimes which in turn affect the distribution of observations across the fixed, intermediate and floating regimes, more particularly in developing countries. Once these conflicting points have been removed, our results suggest that, for both developing and emerging countries, the three ERR categories do not differ significantly in terms of currency misalignments.

This last result is then consistent with the difficulty of the empirical literature to find a consensus on any consequence of exchange rate regimes. But, unlike a strand of the literature which explains these inconclusive results by the inability of the *de facto* classifications schemes to accurately define flexible ERR categories (Rose, 2011; Gosh et al., 2014)[26], our results show that, if ERR classifications have to be blamed, they should

[26]The failure of the *de facto* classifications schemes to accurately define ERR categories other than the peg category occurs either because the floating category corresponds to a non well-defined monetary policy, as suggested by Rose (2011), either because the use of existing "aggregate" regime classifications does not allow to differentiate between very heterogeneous bilateral exchange rate relationships, and as such do not adequately capture exchange rate flexibility (Gosh et al., 2014).

rather be blamed for their failure to adequately account for dysfunctional monetary regimes.

6 Conclusion

The aim of this paper was to re-examine the relationship between exchange rate regimes and currency misalignments. Relying on a panel of 73 developing and emerging countries over the period 1980-2012, our results show that there is no robust relationship between currency misalignments and exchange rate regimes. The RR classification suggests that, on average, fixed ERR perform the best in limiting currency misalignments —at least for developing countries, but when using the LYS and OST classifications this result does not hold anymore. This discrepancy across results has proven to be robust to various robustness checks.

This apparent lack of agreement across *de facto* exchange rate classification schemes is not surprising to the extent that classifications are "*simply measuring different things*", as rightly observed by Klein and Shambaugh (2008). In other words, the less the classifications are correlated, the lower the probability to obtain results robust across these classifications. In attempting to assess the effect of the ERR, cautious should therefore be taken as the results are likely to be sensitive to the classification scheme. We evidence indeed that using a consensus classification removes the discrepancy across classifications' results. In particular, this consensus classification leads to the conclusion that, for both developing and emerging countries, exchange rate regimes do not differ significantly in terms of currency misalignments.

While these results may be perceived as disappointing, they show, on the contrary, that in order to discriminate exchange rate regimes in terms of currency misalignments, it is important to differentiate these monetary arrangements by looking at their consistency with their underlying macroeconomic policies, as the RR classification does. Indeed, episodes of currency misalignments are not related to the trade-off between floating and fixed exchange rates, neither to the use foreign exchange reserves —which do not adequately capture policy intervention, but are mainly the result of dysfunctional monetary regimes.

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Appendices

A. Data appendix

Table A.1 — Data sources and definitions

Variables & Definitions	Sources
Exchange rate regimes	
RR: Reinhart & Rogoff de facto classification.	Ilzetzki, Reinhart & Rogoff (2011)
LYS: Levy-Yeyati & Sturzenegger *de facto* classification.	Levy-Yeyati & Sturzenegger (2005)
OST: Obstfeld, Shambaugh & Taylor de facto classification	Obstfeld, Shambaugh & Taylor (2010)
Macroeconomic indicators	
reer: Real Effective Exchange Rate (67 trading partners)	Bruegel
tot: Terms of trade index (2000 = 100), expressed in logarithm	WDI
nfa: Net Foreign Asset position (%GDP)	Lane & Milesi-Ferretti [a,b]
rprod: Relative productivity: measured by the ratio of GDP per capita (PPP) in the country and the trade-weighted average GDP per capita PPP of the top 67 partner countries.	Author calculations
inflation: Changes in the consumer price index (in logarithm)	WEO
kaopen: financial openness measured on a scale from 0 to 1, 1 being the highest financial openness degree.	Chinn & Ito
GDP (PPP): GDP based on purchasing-power-parity	WDI
Reserves: Total reserves minus gold (%GDP)	WDI
Land area: Country's total area.	WDI

WDI: *World Development Indicators* (World Bank)

WEO: *World Economic Outlook* (International Monetary Fund)

a: http://www.philiplane.org/EWN.html

b: completed using informations provided by the IFS (*International Financial Statistics*, IMF)

Table A.2 – List of countries (73)

Algeria^{E}	Costa Rica^{E}	Kenya	Rwanda
Angola	Cote d'Ivoire	Lesotho	Sao Tome & Principe.
Argentina^{E}	Dominican Rep.^{E}	Madagascar	Senegal
Bangladesh	Ecuador^{E}	Malawi	South Africa^{E}
Benin	Egypt.	Malaysia^{E}	Sri Lanka^{E}
Bolivia	El Salvador	Mali	Sudan
Botswana	Ethiopia	Mauritania	Swaziland
Brazil^{E}	Fiji	Mauritius	Tanzania
Burkina Faso	Gabon	Mexico^{E}	Thailand^{E}
Burundi	Gambia	Morocco^{E}	Togo
Cabo Verde	Ghana	Mozambique	Tunisia^{E}
Cameroon	Guatemala	Nicaragua	Turkey^{E}
Central African. Rep	Guinea	Niger	Uganda
Chad	Guinea-Bissau	Nigeria	Uruguay^{E}
China^{E}	Haiti	Pakistan	Venezuela, RB^{E}
Colombia^{E}	Honduras	Panama^{E}	Zambia
Comoros	India^{E}	Paraguay	
Congo Dem. Rep.	Indonesia^{E}	Peru^{E}	
Congo Rep.	Jordan^{E}	Philippines^{E}	

Note: "E" indicates the countries classified as "*emerging markets*"(see Gosh et al., 2014).

Table A.3 — Reinhart & Rogoff *de facto* classification

Six-way classification		***Three-way classification***
Regime	**Code**	**Regime**
No separate legal tender	1	
Pre announced peg or currency board arrangement	1	
Pre announced horizontal band that is narrower than or equal to +/-2%	1	
De facto peg	1	Fixed ERR
Pre announced crawling peg	2	
Pre announced crawling band that is narrower than or equal to +/-2%	2	
De facto crawling peg	2	
De facto crawling band that is narrower than or equal to +/-2%	2	
Pre announced crawling band that is wider than or equal to +/-2%	3	
De facto crawling band that is narrower than or equal to +/-5%	3	
Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time)	3	Intermediate ERR
Managed floating	3	
Freely floating	4	
Freely falling	5	Flexible ERR
Dual market in which parallel market data is missing	6	

Table A.4 — Levy-Yeyati & Sturzenegger *de facto* classification

Five-way classification		***Three-way classification***
Regime	**Code**	**Regime**
Inconclusive determination	1	
Free float	2	Flexible ERR
Dirty float	3	Intermediate ERR
Dirty float/Crawling peg	4	
Fix	5	Fixed ERR

Table A.5 — Obstfeld, Shambaugh & Taylor *de facto* classification

Seven-way classification		***Three-way classification***
Regime	**Code**	**Regime**
0% change in the exchange rate	1	Pegs (Fixed ERR)
Change in the exchange rate lesser or equal to +/-1%	2	
Change in the exchange rate lesser or equal to +/-2%	3	
Fluctuation band that is narrower than or equal to 5% with monthly changes lesser than 1%	4	Soft pegs (Intermediate ERR)
Fluctuation band that is narrower than or equal to 5% with monthly changes lesser than 2 %	5	
Fluctuation band that is wider than 5% but monthly changes lesser than 2%	6	
Fluctuation band that is wider than 5% with monthly changes greater than 2%	7	Nonpegs (Flexible ERR)

Note: Some categories have been excluded from the original classification since they contain very few observations (namely peg type 4 and soft peg type 4).

Table A.6a — Distributions of exchange rate regimes across the *de facto* classifications and country samples, 1980-2012

Period		***Fixed***				***Intermediate***				***Flexible***			
		1980-1989	1990-1999	2000-2012	Full period	1980-1989	1990-1999	2000-2012	Full period	1980-1989	1990-1999	2000-2012	Full period
RR	*All countries*	443	495	684	1,622	142	113	216	471	145	122	49	316
		(60.68)	(67.81)	(72.08)	(67.33)	(19.45)	(15.48)	(22.76)	(19.55)	(19.86)	(16.71)	(5.16)	(13.12)
	DCs	333	352	495	1,180	79	74	120	273	78	64	22	164
		(67.96)	(71.84)	(77.71)	(72.97)	(16.12)	(15.10)	(18.84)	(16.88)	(15.92)	(13.06)	(3.45)	(10.14)
	EMEs	110	143	189	442	63	39	96	198	67	58	27	152
		(45.83)	(59.58)	(60.58)	(55.81)	(26.25)	(16.25)	(30.77)	(25.00)	(27.92)	(24.17)	(8.65)	(19.19)
LYS	*All countries*	352	264	149	765	117	146	63	326	83	150	74	307
		(63.77)	(47.14)	(52.10)	(54.72)	(21.20)	(26.07)	(22.03)	(23.32)	(15.04)	(26.79)	(25.87)	(21.96)
	DCs	287	207	114	608	52	84	38	174	39	81	40	160
		(75.93)	(55.65)	(59.38)	(64.54)	(13.76)	(22.58)	(19.79)	(18.47)	(10.32)	(21.77)	(20.83)	(16.99)
	EMEs	65	57	35	157	65	62	25	152	44	69	34	147
		(37.36)	(30.32)	(37.23)	(34.43)	(37.36)	(32.98)	(26.60)	(33.33)	(25.29)	(36.70)	(36.17)	(32.24)
OST	*All countries*	342	296	431	1,069	105	144	225	474	263	270	267	800
		(48.17)	(41.69)	(46.70)	(45.63)	(14.79)	(20.28)	(24.38)	(20.23)	(263)	(38.03)	(28.93)	(34.14)
	DCs	276	215	342	833	62	92	135	289	152	183	160	495
		(56.33)	(43.88)	(53.69)	(51.52)	(12.65)	(18.78)	(21.19)	(17.87)	(31.02)	(37.35)	(25.12)	(30.61)
	EMEs	66	81	89	236	43	52	90	185	111	87	107	305
		(30.00)	(36.82)	(31.12)	(32.51)	(19.55)	(23.64)	(31.47)	(25.48)	(50.45)	(39.55)	(37.41)	(42.01)

Note: we reported in parentheses the observations in percentage. Observations in the LYS classification go up to the year 2004.

Table A.6b —Distributions of exchange rate regimes across the *de facto* finer classifications, 1980-2012

RR six-way classification			***LYS five-way classification***			***OST seven-way classification***		
	Observations	%		Observations	%		Observations	%
RR 1	848	35.2	***LYS 1***	23	1.6	***OST 1***	672	28.7
RR 2	774	32.1	***LYS 2***	307	21.6	***OST 2***	188	8.0
RR 3	471	19.6	***LYS 3***	125	8.8	***OST 3***	115	4.9
RR 4	77	3.2	***LYS 4***	201	14.1	***OST 4***	71	3.0
RR 5	218	9.0	***LYS 5***	765	53.8	***OST 5***	443	18.9
RR 6	21	0.9				***OST 6***	26	1.1
						OST 7	828	35.3
Total	2409	100		1421	100		2343	100

Note: Observations in the LYS classification go up to the 2004.

Table A.7 — Currency misalignments across exchange rate regimes and classification schemes

	Fixed						***Intermediate***						***Flexible***					
	All countries		*DCs*		*EMEs*		*All countries*		*DCs*		*EMEs*		*All countries*		*DCs*		*EMEs*	
	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]	Obs.	Mean [Std.D]
Misalignments (in absolute values)																		
RR	1592	0.234 [0.32]	1156	0.221 [0.22]	436	0.269 [0.48]	465	0.508 [2.22]	267	0.254 [0.19]	198	0.851 [3.38]	311	0.516 [1.19]	159	0.494 [0.67]	152	0.539 [1.57]
LYS	745	0.377 [1.72]	588	0.244 [0.31]	157	0.874 [3.66]	325	0.426 [1.28]	173	0.299 [0.42]	152	0.568 [1.81]	307	0.282 [0.58]	160	0.229 [0.20]	147	0.341 [0.80]
OST	1048	0.327 [1.48]	817	0.220 [0.29]	231	0.707 [3.08]	463	0.286 [0.42]	279	0.287 [0.30]	184	0.286 [0.55]	791	0.357 [0.85]	486	0.290 [0.32]	305	0.465 [1.30]
Undervaluations																		
RR	932	-0.228 [0.24]	707	-0.238 [0.24]	225	-0.196 [0.24]	251	-0.601 [2.89]	160	-0.236 [0.17]	91	-1.243 [4.74]	177	-0.292 [0.24]	70	-0.305 [0.19]	107	-0.284 [0.26]
LYS	340	-0.486 [2.49]	271	-0.211 [0.21]	69	-1.565 [5.41]	210	-0.218 [0.23]	124	-0.243 [0.24]	86	-0.183 [0.21]	186	-0.209 [0.17]	108	-0.219 [0.16]	78	-0.196 [0.19]
OST	573	-0.359 [1.92]	443	-0.194 [0.16]	130	-0.922 [3.99]	279	-0.271 [0.31]	187	-0.311 [0.33]	92	-0.190 [0.24]	472	-0.272 [0.24]	307	-0.271 [0.21]	165	-0.274 [0.29]
Overvaluations																		
RR	660	0.242 [0.39]	449	0.193 [0.18]	211	0.348 [0.64]	214	0.398 [0.99]	107	0.281 [0.23]	107	0.517 [1.38]	134	0.811 [1.76]	89	0.642 [0.86]	45	1.146 [2.78]
LYS	405	0.285 [0.46]	317	0.273 [0.38]	88	0.332 [0.69]	115	0.803 [2.08]	49	0.443 [0.67]	66	1.070 [2.67]	121	0.395 [0.89]	52	0.250 [0.26]	69	0.504 [1.14]
OST	475	0.289 [0.60]	374	0.251 [0.39]	101	0.429 [1.04]	184	0.310 [0.54]	92	0.238 [0.22]	92	0.382 [0.73]	319	0.484 [1.29]	179	0.323 [0.45]	140	0.690 [1.87]

B. Additional results

Table B.1 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*RR classification*; 1980-2004)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Six-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.1.1	B.1.2	B.1.3	B.1.4	B.1.5	B.1.6		B.1.7	B.1.8	B.1.9	B.1.10	B.1.11	B.1.12
ERR													
Fixed	-0.339	-0.379	-0.204**	-0.223**	-0.532	-0.649	*RR* 1	-0.218*	-0.236*	-0.336**	-0.347**	0.127	0.108
	(-1.53)	(-1.48)	(-2.31)	(-2.58)	(-1.02)	(-1.02)		(-1.94)	(-1.68)	(-2.20)	(-2.39)	(0.43)	(0.29)
Interm.	0.169	0.180	-0.148**	-0.155*	0.763	0.810	*RR* 2	-0.421	-0.461	-0.300*	-0.301*	-0.707	-0.826
	(0.66)	(0.65)	(-2.05)	(-1.98)	(1.01)	(1.00)		(-1.56)	(-1.49)	(-1.90)	(-1.97)	(-1.08)	(-1.08)
Flexible	—	—	—	—	—	—	*RR* 3	0.164	0.183	-0.261*	-0.258*	1.014	1.155
								(0.54)	(0.55)	(-1.96)	(-1.90)	(1.06)	(1.07)
							RR 4	-0.059	-0.044	-0.332	-0.357	1.218	1.515
								(-0.27)	(-0.16)	(-0.44)	(-1.29)	(0.98)	(0.98)
							RR 5	—	—	—	—	—	—
							RR 6	0.022	0.063	-0.205	-0.218	1.191	1.503
								(0.12)	(0.27)	(-1.34)	(-1.34)	(0.98)	(0.99)
Control variables													
Crisis	0.031	0.029	0.039	0.038	0.015	0.005		0.029	0.027	0.028	0.027	0.087	0.107
	(1.21)	(0.71)	(1.32)	(0.94)	(0.16)	(0.04)		(1.13)	(0.64)	(0.94)	(0.66)	(0.88)	(0.85)
kaopen	0.173	0.452	-0.069	-0.053	0.634	0.969		0.189	0.470	-0.057	-0.034	0.696	1.145
	(0.83)	(0.97)	(-1.52)	(-0.65)	(1.07)	(1.10)		(0.87)	(0.97)	(-1.63)	(-0.57)	(1.11)	(1.18)
Constant	0.745***	0.798***	0.527***	0.505***	1.090**	1.292**		0.693***	0.761***	0.647***	0.611***	0.813***	0.957***
	(4.03)	(4.92)	(8.88)	(8.68)	(2.80)	(2.97)		(6.43)	(7.37)	(5.22)	(6.18)	(4.40)	(4.28)
R-Sq.	0.05	0.07	0.12	0.15	0.11	0.13		0.05	0.07	0.15	0.19	0.13	0.16
Obs./ Countries	1472/60	860/35	997/41	510/21	475/19	350/14		1472/60	860/35	997/41	510/21	475/19	350/14

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.2 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*RR classification*; APEER misalignments)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Six-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.2.1	B.2.2	B.2.3	B.2.4	B.2.5	B.2.6		B.2.7	B.2.8	B.2.9	B.2.10	B.2.11	B.2.12
ERR													
Fixed	-0.087***	-0.083***	-0.131**	-0.122**	-0.051**	-0.052**	*RR* 1	-0.056**	-0.056**	-0.096*	-0.097*	-0.043*	-0.044*
	(-2.92)	(-2.74)	(-2.48)	(-2.27)	(-2.19)	(-2.11)		(-2.19)	(-2.14)	(-1.86)	(-1.87)	(-1.91)	(-1.89)
Interm.	-0.046	-0.044	-0.081	-0.076	-0.011	-0.001	*RR* 2	-0.106***	-0.103***	-0.158***	-0.160***	-0.055*	-0.055*
	(-1.63)	(-1.45)	(-1.59)	(-1.37)	(-0.54)	(-0.40)		(-3.00)	(-2.99)	(-2.69)	(-2.75)	(-1.76)	(-1.74)
Flexible	—	—	—	—	—	—	*RR* 3	-0.045*	-0.045*	-0.092*	-0.093*	-0.009	-0.009
								(-1.66)	(-1.64)	(-1.84)	(-1.85)	(-0.40)	(-0.38)
							RR 4	-0.012	-0.011	-0.057	-0.061	0.016	0.019
								(-0.37)	(-0.33)	(-1.31)	(-1.27)	(0.87)	(0.93)
							RR 5	—	—	—	—	—	—
							RR 6	0.044	0.043	0.061	0.063	-0.018	-0.015
								(0.32)	(0.32)	(0.27)	(0.28)	(-0.93)	(-0.73)
Control variables													
Crisis	0.045***	0.038**	0.046**	0.042	0.034	0.028		0.045***	0.042**	0.044**	0.040*	0.034	0.033
	(3.29)	(2.05)	(2.38)	(1.48)	(1.43)	(0.99)		(3.31)	(2.55)	(2.37)	(1.69)	(1.43)	(1.27)
kaopen	-0.049	-0.039	-0.096	-0.065	0.026	0.021		-0.044	-0.035	-0.086	-0.066	0.027	0.029
	(-0.99)	(-0.60)	(-1.25)	(-0.57)	(0.88)	(0.57)		(-0.92)	(-0.58)	(-1.14)	(-0.66)	(0.92)	(0.85)
Constant	0.242***	0.266***	0.308***	0.351***	0.149***	0.161***		0.230***	0.251***	0.297***	0.332***	0.147***	0.158***
	(5.76)	(5.22)	(4.66)	(4.09)	(4.60)	(4.23)		(5.74)	(5.55)	(4.40)	(4.36)	(4.46)	(4.56)
R-Sq.	0.12	0.14	0.15	0.18	0.15	0.15		0.14	0.14	0.17	0.18	0.15	0.15
Obs./ Countries	2407/73	1419/43	1615/49	792/24	792/24	627/19		2407/73	1749/53	1615/49	1056/32	792/24	693/21

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.3 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*LYS classification*; APEER misalignments)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification							*Five-way classification*					
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.3.1	B.3.2	B.3.3	B.3.4	B.3.5	B.3.6		B.3.7	B.3.8	B.3.9	B.3.10	B.3.11	B.3.12
ERR													
Flexible	—	—	—	—	—	—	*LYS* 1	0.017	0.017	0.004	0.004	0.055	0.057
								(0.81)	(0.82)	(0.17)	(0.16)	(1.40)	(1.44)
Interm.	0.017	0.017	0.016	0.016	0.018	0.017	*LYS* 2	—	—	—	—	—	—
	(1.33)	(1.29)	(0.84)	(0.83)	(0.88)	(0.84)							
Fixed	0.012	0.012	0.003	0.002	0.013	0.013	*LYS* 3	0.049***	0.049***	0.063***	0.063***	0.023	0.022
	(0.93)	(0.90)	(0.15)	(0.14)	(0.59)	(0.58)		(3.42)	(3.36)	(3.16)	(3.17)	(0.94)	(0.88)
							LYS 4	4E-4	2E-4	-0.008	-0.008	0.015	0.015
								(0.03)	(0.01)	(-0.33)	(-0.32)	(0.76)	(0.74)
							LYS 5	0.016	0.016	0.010	0.010	0.013	0.013
								(1.28)	(1.24)	(0.58)	(0.56)	(0.92)	(0.59)
Control variables													
Crisis	0.051***	0.050***	0.059**	0.058**	0.024	0.026		0.048**	0.047***	0.055**	0.054**	0.024	0.026
	(3.21)	(2.98)	(2.60)	(2.41)	(0.97)	(0.99)		(3.02)	(2.79)	(2.42)	(2.23)	(0.92)	(0.95)
kaopen	-0.092	-0.091	-0.157	-0.151	0.017	0.018		-0.088	-0.086	-0.148	-0.142	0.019	0.020
	(-1.36)	(-1.30)	(-1.54)	(-1.45)	(0.54)	(0.54)		(-1.37)	(-1.30)	(-1.55)	(-1.45)	(0.60)	(0.61)
Constant	0.161***	0.167***	0.203***	0.209***	0.081*	0.085*		0.159***	0.165***	0.195***	0.201***	0.084**	0.089*
	(4.46)	(4.42)	(3.90)	(3.86)	(1.94)	(1.84)		(4.52)	(4.48)	(3.89)	(3.85)	(2.11)	(2.02)
R-Sq.	0.08	0.08	0.11	0.11	0.06	0.07		0.08	0.09	0.12	0.12	0.06	0.07
Obs./ Countries	1397/60	1274/55	941/41	868/38	456/19	406/17		1420/60	1297/55	960/41	887/38	460/19	410/17

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.4 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*Asymmetric effects; RR classification*)

Dependent variable:

	Undervaluations						*Overvaluations*					
	Whole sample		LDCs		EMEs		Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B	A	B	A	B	A	B
	B.4.1	B.4.2	B.4.3	B.4.4	B.4.5	B.4.6	B.4.7	B.4.8	B.4.9	B.4.10	B.4.11	B.4.12
ERR												
Fixed	0.009	-0.039	0.045	0.067	-0.219	-0.277	-0.419	-0.435	-0.041	-0.029	-0.640	-0.659
	(0.11)	(-0.26)	(0.74)	(1.09)	(-0.64)	(-0.70)	(-1.03)	(-1.04)	(-0.70)	(-0.31)	(-1.05)	(-1.10)
Interm.	-0.062	-0.079	0.052	0.060	-0.500	-0.527	-0.166	-0.182	0.004	-0.001	-0.194	-0.161
	(-0.42)	(-0.42)	(1.17)	(1.34)	(-0.82)	(-0.83)	(-0.84)	(-0.90)	(0.11)	(-0.03)	(-0.64)	(-0.58)
Flexible	—	—	—	—	—	—	—	—	—	—	—	—
Control variables												
Crisis	-0.022	0.002	-0.048**	-0.037	0.059	0.140	0.077*	0.114	0.050	0.062	0.099	0.089
	(-0.62)	(0.03)	(-2.31)	(-1.44)	(0.35)	(0.60)	(1.72)	(1.56)	(1.08)	(0.89)	(0.91)	(0.65)
kaopen	0.209	0.202	0.044	0.102	0.417	0.669	-0.135	-0.072	0.048	0.104	-0.219	-0.207
	(1.25)	(1.23)	(0.66)	(1.05)	(1.09)	(1.07)	(-0.72)	(-0.44)	(0.76)	(1.39)	(-0.83)	(-0.77)
Constant	-0.550***	-0.687**	-0.363***	-0.420***	-0.921*	-1.006*	0.766*	0.759**	0.293***	0.180	1.170*	1.240**
	(-3.08)	(-2.63)	(-3.73)	(-3.42)	(-1.93)	(-1.80)	(1.91)	(2.01)	(3.18)	(1.14)	(1.96)	(2.18)
R-Sq.	0.05	0.08	0.15	0.27	0.13	0.15	0.08	0.11	0.06	0.09	0.18	0.20
Obs./ Countries	1359/73	801/43	936/49	472/24	423/24	329/19	1007/71	597/42	644/47	305/23	363/24	292/19

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.5 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*Asymmetric effects; LYS classification*)

Dependent variable:

	Undervaluations						*Overvaluations*					
	Whole sample		LDCs		EMEs		Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B	A	B	A	B	A	B
	B.5.1	B.5.2	B.5.3	B.5.4	B.5.5	B.5.6	B.5.7	B.5.8	B.5.9	B.5.10	B.5.11	B.5.12
ERR												
Flexible	—	—	—	—	—	—	—	—	—	—	—	—
Interm.	0.124	0.124	-0.004	-0.005	0.391	0.387	0.243	0.238	0.087*	0.086*	0.331	0.320
	(1.09)	(1.07)	(-0.16)	(-0.21)	(1.08)	(1.06)	(1.16)	(1.16)	(1.78)	(1.74)	(1.07)	(1.08)
Fixed	-0.155	-0.159	0.005	0.002	-0.916	-0.956	0.089	0.089	0.036	0.041	0.122	0.145
	(-0.88)	(-0.89)	(0.14)	(0.07)	(-0.99)	(-1.01)	(1.36)	(1.39)	(0.78)	(0.88)	(0.84)	(0.90)
Control variables												
Crisis	-0.041	-0.041	-0.033	-0.030	-0.154	-0.146	0.079	0.087	0.041	0.045	0.083	0.171
	(-0.98)	(-0.91)	(-1.13)	(-0.94)	(-0.82)	(-0.80)	(1.56)	(1.55)	(0.66)	(0.70)	(0.61)	(1.16)
kaopen	-0.074	-0.092	0.053	0.051	-0.195	-0.048	0.379	0.417	-0.071	-0.051	1.053	1.136
	(-0.46)	(-0.51)	(0.58)	(0.53)	(-0.43)	(-0.11)	(1.04)	(1.08)	(-0.86)	(-0.58)	(1.21)	(1.23)
Constant	-0.150	-0.179	-0.308***	-0.313***	-0.078	-0.261	0.197	0.201	0.249***	0.243**	0.136	0.139
	(-0.54)	(-0.65)	(-3.07)	(-3.13)	(-0.12)	(-0.44)	(1.14)	(1.12)	(2.81)	(2.52)	(0.31)	(0.29)
R-Sq.	0.06	0.06	0.11	0.12	0.17	0.18	0.08	0.09	0.06	0.06	0.21	0.23
Obs./ Countries	736/60	666/55	503/41	463/38	233/19	203/17	640/58	587/53	417/39	384/36	223/19	203/17

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.6 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*Outliers; RR classification*)

Dependent variable: $|Mis_{i,t}|$

Winsorisation	1%						2%					
	Whole sample		LDCs		EMEs		Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B	A	B	A	B	A	B
	B.6.1	B.6.2	B.6.3	B.6.4	B.6.5	B.6.6	B.6.7	B.6.8	B.6.9	B.6.10	B.6.11	B.6.12
ERR												
Fixed	-0.154**	-0.146**	-0.161**	-0.156**	-0.132	-0.125	-0.086***	-0.080**	-0.116**	-0.111**	-0.053	-0.052
	(-2.34)	(-2.30)	(-2.08)	(-2.03)	(-1.43)	(-1.47)	(-2.66)	(-2.24)	(-2.53)	(-2.26)	(-1.12)	(-1.00)
Interm.	-0.133**	-0.137**	-0.124*	-0.126*	-0.130	-0.133	-0.071**	-0.074**	-0.088*	-0.087*	-0.049	-0.049
	(-2.00)	(-2.01)	(-1.81)	(-1.69)	(-1.22)	(-1.18)	(-2.24)	(-2.11)	(-1.96)	(-1.71)	(-1.10)	(-0.98)
Flexible	—	—	—	—	—	—	—	—	—	—	—	—
Control variables												
Crisis	0.051***	0.062**	0.052**	0.059*	0.068	0.074	0.037***	0.037**	0.046**	0.049*	0.027	0.024
	(2.86)	(2.24)	(2.31)	(1.79)	(1.34)	(1.24)	(2.66)	(1.98)	(2.35)	(1.80)	(1.05)	(0.79)
kaopen	-0.073	-0.099	-0.025	-0.056	-0.132	-0.144	-0.041	-0.063	3E-04	-0.017	-0.092	-0.094
	(0.34)	(-1.02)	(-0.51)	(-0.69)	(-0.78)	(-0.69)	(-0.72)	(-0.85)	(0.01)	(-0.30)	(-0.74)	(-0.61)
Constant	0.489***	0.480***	0.481***	0.447***	0.495***	0.510***	0.422***	0.420***	0.437***	0.405***	0.411***	0.434***
	(8.61)	(10.04)	(8.09)	(7.98)	(5.81)	(6.65)	(11.29)	(9.53)	(9.82)	(6.93)	(6.57)	(6.30)
R-Sq.	0.06	0.07	0.11	0.16	0.06	0.06	0.10	0.13	0.13	0.21	0.08	0.08
Obs./ Countries	2366/73	1398/43	1580/49	777/49	786/24	621/19	2366/73	1398/43	1580/49	777/24	786/24	621/19

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.7 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*Outliers; LYS classification*)

Dependent variable: $|Mis_{i,t}|$

Winsorisation	1%						2%					
	Whole sample		LDCs		EMEs		Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B	A	B	A	B	A	B
	B.7.1	B.7.2	B.7.3	B.7.4	B.7.5	B.7.6	B.7.7	B.7.8	B.7.9	B.7.10	B.7.11	B.7.12
ERR												
Flexible	—	—	—	—	—	—	—	—	—	—	—	—
Interm.	0.012	0.011	0.011	0.009	0.014	0.015	-0.008	-0.009	0.015	0.014	-0.036	-0.035
	(0.37)	(0.35)	(0.36)	(0.33)	(0.20)	(0.22)	(-0.43)	(-0.45)	(0.48)	(0.46)	(-1.26)	(-1.17)
Fixed	-0.037	-0.036	-0.014	-0.015	-0.118	-0.113	-0.030	-0.029	-0.010	-0.011	-0.086	-0.082
	(-0.98)	(-0.97)	(-0.46)	(-0.49)	(-1.02)	(-1.02)	(-0.92)	(-0.90)	(-0.34)	(-0.38)	(-1.00)	(-1.01)
Control variables												
Crisis	0.065**	0.067**	0.059*	0.063*	0.108	0.118	0.054**	0.056**	0.057*	0.060*	0.073	0.078
	(2.49)	(2.42)	(1.85)	(1.84)	(1.36)	(1.34)	(2.59)	(2.52)	(1.84)	(1.84)	(1.46)	(1.44)
kaopen	-0.005	0.012	-0.136*	-0.124*	0.296	0.351	-0.024	-0.011	-0.111**	-0.098*	0.171	0.202
	(-0.06)	(0.13)	(-1.95)	(-1.74)	(1.06)	(1.09)	(-0.46)	(-0.20)	(-2.18)	(-1.89)	(1.09)	(1.16)
Constant	0.342***	0.342***	0.358***	0.364***	0.267	0.251	0.345***	0.347***	0.349***	0.355***	0.306***	0.298**
	(6.50)	(5.79)	(9.62)	(9.37)	(1.40)	(1.11)	(9.50)	(8.68)	(9.14)	(8.86)	(2.83)	(2.34)
R-Sq.	0.04	0.04	0.09	0.09	0.07	0.08	0.06	0.06	0.11	0.11	0.07	0.07
Obs./ Countries	1376/60	1253/55	920/41	847/38	456/19	406/17	1376/60	1253/55	920/41	847/38	435/19	406/17

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.8 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*RR classification*; with *inflation*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Six-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.8.1	B.8.2	B.8.3	B.8.4	B.8.5	B.8.6		B.8.7	B.8.8	B.8.9	B.8.10	B.8.11	B.8.12
ERR													
Fixed	-0.144*	-0.093	-0.144**	-0.089**	-0.118	-0.101	*RR* 1	-0.083	-0.079	-0.218**	-0.233***	0.222	0.266
	(-1.94)	(-1.21)	(-2.44)	(-2.05)	(-0.72)	(-0.54)		(-1.11)	(-0.92)	(-2.63)	(-2.81)	(0.70)	(0.74)
Interm.	0.106	0.148	-0.111**	-0.070	0.377	0.385	*RR* 2	-0.188*	-0.173*	-0.181**	-0.189**	-0.316	-0.264
	(0.59)	(0.73)	(-2.02)	(-1.45)	(0.89)	(0.87)		(-1.79)	(-1.80)	(-2.24)	(-2.38)	(-0.98)	(-0.91)
Flexible	—	—	—	—	—	—	*RR* 3	0.101	0.111	-0.160**	-0.168**	0.478	0.520
								(0.53)	(0.53)	(-2.19)	(-2.27)	(0.93)	(0.94)
							RR 4	-0.008	0.006	-0.125	-0.130	0.657	0.745
								(-0.08)	(0.05)	(-1.09)	(-1.12)	(0.91)	(0.91)
							RR 5	—	—	—	—	—	—
							RR 6	-0.072	-0.069	-0.083	-0.106	0.602	0.684
								(-0.66)	(-0.50)	(-0.87)	(-0.89)	(0.90)	(0.91)
Control variables													
Inflation	0.005	0.013	0.007	0.019*	-0.005	-0.004		0.005	0.005	0.006	0.006	-0.004	-0.004
	(0.80)	(1.39)	(0.89)	(1.83)	(-0.75)	(-0.66)		(0.81)	(0.85)	(0.89)	(0.90)	(-0.61)	(-0.55)
Crisis	0.055**	0.066*	0.047**	0.081**	0.094	0.088		0.054**	0.049	0.044**	0.038	0.114	0.111
	(2.06)	(1.66)	(2.00)	(2.07)	(0.96)	(0.79)		(2.01)	(1.57)	(1.97)	(1.30)	(1.09)	(1.01)
kaopen	-0.248	-0.224	-0.009	0.014	-0.556	-0.623		-0.241	-0.235	-0.007	-0.020	-0.491	-0.551
	(-0.94)	(-0.83)	(-0.24)	(0.25)	(-0.92)	(-0.88)		(-0.94)	(-0.92)	(-0.17)	(-0.36)	(-0.87)	(-0.86)
Constant	0.696***	0.754***	0.463***	0.371***	1.149**	1.299**		0.675***	0.733***	0.521***	0.517***	1.027**	1.090**
	(3.21)	(2.80)	(7.97)	(4.69)	(2.06)	(2.08)		(3.89)	(3.60)	(8.30)	(8.34)	(2.38)	(2.38)
R-Sq.	0.04	0.06	0.16	0.36	0.07	0.08		0.04	0.05	0.17	0.22	0.09	0.09
Obs./ Countries	2366/73	1398/43	1580/49	777/24	786/24	621/19		2366/73	1716/53	1580/49	1029/32	786/24	687/21

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.9 — Sensitivity analysis: Currency misalignments and exchange rate regimes (*LYS classification*; with *inflation*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Five-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.9.1	B.9.2	B.9.3	B.9.4	B.9.5	B.9.6		B.9.7	B.9.8	B.9.9	B.9.10	B.9.11	B.9.12
ERR													
Flexible	—	—	—	—	—	—	*LYS* 1	-0.013	-0.012	-0.018	-0.017	-0.500	-0.502
								(-0.16)	(-0.15)	(-0.55)	(-0.52)	(-1.53)	(-1.51)
Interm.	0.035	0.033	0.015	0.015	0.041	0.026	*LYS* 2	—	—	—	—	—	—
	(0.57)	(0.54)	(0.49)	(0.47)	(0.34)	(0.24)							
Fixed	0.301	0.296	-0.002	-0.003	1.072	1.072	*LYS* 3	0.083	0.080	0.042	0.041	0.115	0.098
	(0.98)	(0.99)	(-0.07)	(-0.10)	(1.05)	(1.05)		(0.76)	(0.75)	(1.22)	(1.18)	(0.68)	(0.63)
							LYS 4	0.008	0.006	8E-4	8E-4	0.014	0.001
								(0.21)	(0.16)	(0.02)	(0.02)	(0.13)	(0.01)
							LYS 5	0.303	0.298	0.002	0.001	1.079	1.080
								(0.99)	(0.99)	(0.09)	(0.05)	(1.05)	(1.05)
Control variables													
Inflation	0.015	0.015	0.019*	0.019*	-0.002	-0.002		0.015	0.015	0.019*	0.019*	-0.004	-0.004
	(1.62)	(1.64)	(1.88)	(1.88)	(-0.48)	(-0.46)		(1.54)	(1.58)	(1.86)	(1.87)	(-0.84)	(-0.76)
Crisis	0.100*	0.106	0.069*	0.071*	0.123	0.169		0.096*	0.101*	0.066*	0.068*	0.116	0.162
	(1.88)	(1.83)	(1.99)	(1.96)	(1.05)	(1.08)		(1.91)	(1.85)	(1.88)	(1.86)	(1.03)	(1.07)
kaopen	0.052	0.084	-0.038	-0.024	-0.112	-0.120		0.051	0.087	-0.034	-0.020	-0.104	-0.111
	(0.58)	(0.79)	(-0.83)	(-0.49)	(-0.52)	(-0.51)		(0.57)	(0.77)	(-0.78)	(-0.44)	(-0.49)	(-0.48)
Constant	0.305**	0.336**	0.318***	0.323***	0.488*	0.643***		0.304**	0.336**	0.314***	0.318***	0.518**	0.677***
	(2.08)	(2.54)	(6.69)	(6.44)	(1.94)	(3.68)		(2.06)	(2.51)	(6.70)	(6.44)	(2.11)	(3.89)
R-Sq.	0.05	0.05	0.32	0.32	0.11	0.11		0.05	0.05	0.32	0.33	0.11	0.12
Obs./ Countries	1376/60	1253/55	920/41	847/38	456/19	406/17		1399/60	1276/55	939/41	866/38	460/19	410/17

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.10 — Sensitivity analysis: Wu-Hausman test results

ERR classifications		Sample					
		Whole sample		LDCs		EMEs	
		A	B	A	B	A	B
RR	*Three-way*	12.50	18.10	9.56	4.73	3.05	1.98
		(0.00)	(0.00)	(0.00)	(0.01)	(0.05)	(0.13)
	Six-way	20.67	20.38	15.14	4.11	24.76	19.48
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LYS	*Three-way*	20.71	24.19	2.11	1.45	79.68	68.18
		(0.00)	(0.00)	(0.12)	(0.23)	(0.00)	(0.00)
	Five-way	27.39	32.82	6.03	3.51	51.61	45.65
		(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
OST	*Three-way*	11.77	13.69	13.36	17.47	14.24	19.62
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Seven-way	23.69	21.59	9.65	8.15	25.32	25.58
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes: *p*.values are reported in parentheses. Null: exogeneity of the exchange rate regimes.

Table B.11 — Sensitivity analysis: Currency misalignments and exchange rate regimes (One-year lagged ERR; *RR classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification							*Six-way classification*					
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.11.1	B.11.2	B.11.3	B.11.4	B.11.5	B.11.6		B.11.7	B.11.8	B.11.9	B.11.10	B.11.11	B.11.12
ERR													
l.Fixed	-0.101*	-0.086	-0.154**	-0.164**	-0.006	0.018	*l.RR* 1	-0.071	-0.078	-0.257**	-0.283**	0.267	0.311
	(-1.85)	(-1.20)	(-1.98)	(-2.17)	(-0.05)	(0.10)		(-0.63)	(-0.65)	(-2.03)	(-2.28)	(0.73)	(0.76)
l.Interm.	0.105	0.111	-0.118*	-0.137*	0.411	0.433	*l.RR* 2	-0.132*	-0.123	-0.227*	-0.242**	-0.137	-0.093
	(0.53)	(0.50)	(-1.73)	(-1.90)	(0.87)	(0.85)		(-1.85)	(-1.63)	(-1.81)	(-1.97)	(-0.65)	(-0.47)
l.Flexible	—	—	—	—	—	—	*l.RR* 3	0.096	0.100	-0.202*	-0.217*	0.512	0.555
								(0.42)	(0.42)	(-1.78)	(-1.91)	(0.91)	(0.92)
							l.RR 4	-0.023	-0.007	-0.205	-0.210	0.715	0.801
								(-0.15)	(-0.04)	(-1.22)	(-1.22)	(0.98)	(0.98)
							l.RR 5	—	—	—	—	—	—
							l.RR 6	-0.088	-0.084	-0.219	-0.250	0.649	0.723
								(-0.65)	(-0.52)	(-1.35)	(-1.39)	(0.98)	(0.98)
Control variables													
Crisis	0.082**	0.089**	0.074**	0.094**	0.079	0.067		0.081***	0.084**	0.075***	0.086**	0.078	0.060
	(2.62)	(2.11)	(2.57)	(2.03)	(0.95)	(0.67)		(2.66)	(2.34)	(2.67)	(2.38)	(0.98)	(0.73)
kaopen	-0.278	-0.276	-0.043	-0.065	-0.562	-0.633		-0.274	-0.267	-0.036	-0.045	-0.510	-0.568
	(-1.02)	(-1.00)	(-0.75)	(-0.69)	(-0.92)	(-0.90)		(-1.02)	(-1.00)	(-0.67)	(-0.59)	(-0.89)	(-0.88)
Constant	0.875**	1.217**	0.479***	0.517***	0.418**	1.265**		0.873**	1.076**	0.563***	0.611***	1.582	1.760
	(2.25)	(2.04)	(6.62)	(8.54)	(2.35)	(2.10)		(2.44)	(2.25)	(4.78)	(6.60)	(1.55)	(1.52)
R-Sq.	0.04	0.05	0.11	0.16	0.07	0.08		0.04	0.04	0.13	0.18	0.08	0.09
Obs./ Countries	2303/73	1361/43	1539/49	757/24	764/24	604/19		2303/73	1670/53	1539/49	1002/32	764/24	668/21

Notes: The prefix " *l.* " indicates the one-year lagged variable. The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.12 — Sensitivity analysis: Currency misalignments and exchange rate regimes (One-year lagged ERR; *LYS classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification							*Five-way classification*					
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.12.1	B.12.2	B.12.3	B.12.4	B.12.5	B.12.6		B.12.7	B.12.8	B.12.9	B.12.10	B.12.11	B.12.12
ERR													
l.Flexible	—	—	—	—	—	—	*l.LYS* 1	-0.093	-0.094	-0.041	-0.041	-0.623	-0.637
								(-1.36)	(-1.35)	(-0.97)	(-0.97)	(-1.60)	(-1.60)
l.Interm.	-0.015	-0.016	-0.019	-0.020	-0.063	-0.070	*l.LYS* 2	—	—	—	—	—	—
	(-0.55)	(-0.58)	(-0.67)	(-0.68)	(-0.83)	(-0.85)							
l.Fixed	0.285	0.279	0.038	0.038	0.896	0.879	*l.LYS* 3	0.045	0.044	-0.016	-0.017	0.012	0.009
	(1.10)	(1.10)	(1.31)	(1.28)	(1.04)	(1.04)		(0.51)	(0.51)	(-0.42)	(-0.45)	(0.09)	(0.07)
							l.LYS 4	-0.049	-0.051	-0.021	-0.021	-0.092	-0.101
								(-1.59)	(-1.57)	(-0.70)	(-0.71)	(-1.05)	(-1.04)
							l.LYS 5	0.291	0.285	0.041	0.040	0.901	0.885
								(1.10)	(1.11)	(1.36)	(1.33)	(1.04)	(1.04)
Control variables													
Crisis	0.083**	0.089*	0.086*	0.091*	-0.086	-0.052		0.091**	0.098*	0.087*	0.092*	-0.040	-0.001
	(2.02)	(1.98)	(1.76)	(1.77)	(-0.57)	(-0.40)		(2.02)	(1.97)	(1.79)	(1.80)	(-0.32)	(-0.01)
kaopen	0.022	0.053	-0.079*	-0.067	-0.071	-0.070		0.027	0.057	-0.081*	-0.068	-0.047	-0.044
	(0.27)	(0.53)	(-1.98)	(-1.59)	(-0.41)	(-0.38)		(0.30)	(0.53)	(1.97)	(-1.59)	(-0.28)	(-0.24)
Constant	0.157	0.181	0.249***	0.263***	1.229**	1.452*		0.333***	0.366***	0.297***	0.307***	1.211**	1.432**
	(0.80)	(0.93)	(6.91)	(7.00)	(2.33)	(2.07)		(3.34)	(4.30)	(6.97)	(6.82)	(2.39)	(2.11)
R-Sq.	0.04	0.04	0.11	0.12	0.10	0.11		0.04	0.04	0.12	0.12	0.10	0.11
Obs./ Countries	1325/60	1205/55	888/41	816/38	437/19	389/17		1347/60	1227/55	906/41	834/38	441/19	393/17

Notes: The prefix " *l.* " indicates the one-year lagged variable. The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.13 — Sensitivity analysis: Currency misalignments and exchange rate regimes (Predicted ERR; *RR classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Six-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.13.1	B.13.2	B.13.3	B.13.4	B.13.5	B.13.6		B.13.7	B.13.8	B.13.9	B.13.10	B.13.11	B.13.12
ERR													
$Fixed^P$	-0.204**	-0.161*	-0.229*	-0.221*	-0.103	-0.060	$RR\ 1^P$	-0.407	-0.412	-0.655*	-0.724**	0.495	0.658
	(-2.36)	(-1.67)	(-1.93)	(-1.86)	(-0.47)	(-0.23)		(-1.53)	(-1.39)	(-1.84)	(-2.04)	(0.56)	(0.62)
$Interm.^P$	0.158	0.186	-0.168	-0.169	0.665	0.676	$RR\ 2^P$	-0.322	-0.285	-0.551	-0.587	-0.239	0.085
	(0.53)	(0.55)	(-1.64)	(-1.48)	(0.89)	(0.88)		(-1.23)	(-0.96)	(-1.48)	(-1.60)	(-0.37)	(0.13)
$Flexible^P$	—	—	—	—	—	—	$RR\ 3^P$	0.010	0.023	-0.491	-0.521	1.298	1.421
								(0.02)	(0.05)	(-1.51)	(-1.59)	(0.85)	(0.85)
							$RR\ 4^P$	-0.263	-0.251	-0.489	-0.516	2.968	3.319
								(-0.65)	(-0.58)	(-1.08)	(-1.11)	(0.90)	(0.89)
							$RR\ 5^P$	—	—	—	—	—	—
							$RR\ 6^P$	-0.426	-0.461	-0.425	-0.491	2.362	2.686
								(-1.34)	(-1.27)	(-1.23)	(-1.40)	(0.87)	(0.87)
Control variables													
Crisis	0.059**	0.063*	0.051**	0.058*	0.090	0.088		0.059**	0.054*	0.048**	0.045*	0.105	0.101
	(2.22)	(1.66)	(2.25)	(1.75)	(0.94)	(0.79)		(2.11)	(1.76)	(2.21)	(1.69)	(1.04)	(0.95)
kaopen	-0.267	-0.273	-0.029	-0.062	-0.533	-0.603		-0.307	-0.319	-0.022	-0.046	-0.623	-0.705
	(-0.99)	(-0.98)	(-0.58)	(-0.74)	(-0.92)	(-0.89)		(-0.99)	(-1.00)	(-0.51)	(-0.72)	(-0.94)	(-0.94)
Constant	0.703***	0.788***	0.482***	0.445***	1.104**	1.252**		0.738***	0.794***	0.587***	0.576***	1.046**	1.127**
	(3.63)	(3.32)	(7.46)	(7.58)	(2.16)	(2.18)		(4.32)	(3.93)	(4.62)	(5.48)	(2.34)	(2.31)
R-Sq.	0.04	0.05	0.10	0.15	0.07	0.09		0.03	0.04	0.13	0.17	0.07	0.08
Obs./ Countries	2366/73	1398/43	1580/49	777/24	786/24	621/19		2366/73	1716/53	1580/49	1029/32	786/24	687/21

Notes: The superscript " P " indicates the predicted dummy. The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.14 — Sensitivity analysis: Currency misalignments and exchange rate regimes (Predicted ERR; *LYS classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Five-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.14.1	B.14.2	B.14.3	B.14.4	B.14.5	B.14.6		B.14.7	B.14.8	B.14.9	B.14.10	B.14.11	B.14.12
ERR													
$Flexible^P$	—	—	—	—	—	—	$LYS\ 1^P$	0.892	0.940	0.104	0.136	-12.79	-12.89
								(0.29)	(0.30)	(0.11)	(0.14)	(-1.30)	(-1.29)
$Interm.^P$	-0.010	-0.012	-0.029	-0.029	0.037	0.018	$LYS\ 2^P$	—	—	—	—	—	—
	(-0.09)	(-0.10)	(-0.45)	(-0.44)	(0.12)	(0.06)							
$Fixed^P$	1.502	1.497	-0.064	-0.067	2.641	2.627	$LYS\ 3^P$	2.489	2.465	2.848*	2.803*	3.252	3.095
	(1.02)	(1.02)	(-0.57)	(-0.59)	(1.03)	(1.03)		(0.72)	(0.72)	(1.92)	(1.89)	(0.58)	(0.57)
							$LYS\ 4^P$	-1.199	-1.237	-0.881	-0.844	-2.090	-2.444
								(-0.85)	(-0.86)	(-1.27)	(-1.19)	(-0.52)	(-0.58)
							$LYS\ 5^P$	15.643	15.58	0.209	0.189	25.63	25.69
								(1.02)	(1.02)	(0.12)	(0.10)	(0.99)	(0.99)
Control variables													
Crisis	0.112*	0.117*	0.062*	0.065*	0.108	0.149		0.098*	0.103*	0.060*	0.063*	0.065	0.104
	(1.74)	(1.71)	(1.81)	(1.81)	(1.02)	(1.07)		(1.88)	(1.82)	(1.76)	(1.76)	(0.75)	(0.93)
kaopen	-0.053	-0.029	-0.134**	-0.121*	-0.028	-0.029		-0.043	-0.016	-0.125*	-0.114*	-0.002	-0.011
	(-0.67)	(-0.33)	(2.02)	(-1.80)	(-0.14)	(-0.13)		(-0.67)	(-0.22)	(-1.97)	(-1.75)	(-0.02)	(-0.08)
Constant	0.404***	0.421***	0.352***	0.357***	0.716***	0.801***		0.447***	0.460***	0.341***	0.346***	0.865***	0.954***
	(5.31)	(5.42)	(9.99)	(9.48)	(6.56)	(6.33)		(8.97)	(8.51)	(9.44)	(8.95)	(4.79)	(4.35)
R-Sq.	0.05	0.05	0.09	0.09	0.11	0.11		0.04	0.05	0.09	0.10	0.10	0.10
Obs./ Countries	1376/60	1253/55	920/41	847/38	456/19	406/17		1399/60	1276/55	939/41	866/38	460/19	410/17

Notes: The superscript " P " indicates the predicted dummy. The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.15 — Currency misalignments and alternative classification schemes (*OST classification*)

Dependent variable: $|Mis_{i,t}|$

	Three-way classification						*Seven-way classification*						
	Whole sample		LDCs		EMEs			Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B		A	B	A	B	A	B
	B.15.1	B.15.2	B.15.3	B.15.4	B.15.5	B.15.6		B.15.7	B.15.8	B.15.9	B.15.10	B.15.11	B.15.12
ERR													
Fixed	0.111	0.111	0.025	0.024	0.432	0.439	*OST* 1	0.415	0.421	0.043	0.047	1.532	1.532
	(1.07)	(1.07)	(0.92)	(0.85)	(0.95)	(0.95)		(1.05)	(1.06)	(0.89)	(0.95)	(1.00)	(1.00)
Interm.	-0.013	-0.011	0.001	0.001	0.023	0.030	*OST* 2	0.177	0.180	0.030	0.33	0.461	0.465
	(-0.54)	(-0.46)	(0.05)	(0.06)	(0.36)	(0.43)		(1.06)	(1.06)	(1.03)	(1.09)	(0.87)	(0.87)
Flexible	—	—	—	—	—	—	*OST* 3	-0.202	-0.201	0.032	0.033	-0.515	-0.510
								(-0.95)	(-0.95)	(1.47)	(1.50)	(-1.04)	(-1.04)
							OST 4	-0.059	-0.059	-0.127*	-0.129*	-0.103	-0.099
								(-1.06)	(-1.03)	(-1.78)	(-1.79)	(-0.48)	(-0.46)
							OST 5	-0.036	-0.037	0.032*	0.031	-0.086	-0.084
								(-0.62)	(-0.63)	(1.71)	(1.62)	(-0.61)	(-0.59)
							OST 6	0.006	0.007	-0.228	-0.230	0.093	0.095
								(0.08)	(0.09)	(-1.59)	(-1.57)	(0.53)	(0.53)
							OST 7	—	—	—	—	—	—
Control variables													
Crisis	0.080**	0.076**	0.064***	0.068**	0.113	0.112		0.060***	0.060***	0.061**	0.065**	0.041	0.048
	(2.57)	(2.34)	(2.67)	(2.17)	(1.10)	(1.03)		(3.02)	(2.87)	(2.61)	(2.60)	(0.58)	(0.63)
kaopen	-0.331	-0.304	-0.078	-0.077	-0.775	-0.758		-0.259	-0.250	-0.056	-0.048	-0.847	-0.839
	(-1.14)	(-1.12)	(-1.15)	(-0.89)	(-0.99)	(-0.99)		(-1.11)	(-1.09)	(-1.07)	(-0.90)	(-1.01)	(-1.01)
Constant	0.571***	0.625***	0.332***	0.304***	1.095**	1.165**		0.416***	0.422***	0.310***	0.292***	0.877***	0.937***
	(3.69)	(3.16)	(8.67)	(7.01)	(2.20)	(2.20)		(7.75)	(7.55)	(6.16)	(5.80)	(2.89)	(2.88)
R-Sq.	0.04	0.04	0.08	0.10	0.08	0.08		0.05	0.05	0.10	0.10	0.13	0.14
Obs./ Countries	2300/71	1773/55	1580/49	1119/35	720/22	654/20		2300/71	2168/67	1580/49	1481/46	720/22	687/21

Notes: The bar indicates the reference regime. Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Table B.16 — Currency misalignments and exchange rate regimes (*consensus classification*)

Dependent variable: $|Mis_{i,t}|$

	Misalignments from the BEER approach						*Misalignments from the APEER approach*					
	Whole sample		LDCs		EMEs		Whole sample		LDCs		EMEs	
Panel	A	B	A	B	A	B	A	B	A	B	A	B
Basic specification												
Fixed	-0.004	-0.003	-0.028	-0.027	0.039	-0.052	-0.026	-0.018	-0.038	-0.029	0.014	2E-04
	(-0.08)	(-0.05)	(-0.46)	(-0.46)	(0.29)	(-0.41)	(-0.75)	(-0.56)	(-0.99)	(-0.79)	(0.36)	(0.01)
Crisis	0.042*	0.039	0.030	0.031	0.083***	0.097**	0.022**	0.015	0.018	0.008	0.009	9E-05
	(1.88)	(1.50)	(1.05)	(0.91)	(4.44)	(2.80)	(2.12)	(1.54)	(1.36)	(0.72)	(0.61)	(0.00)
kaopen	-0.096*	-0.100*	-0.137**	-0.140**	-0.015	0.053	0.007	0.004	-0.028	-0.026	0.061***	0.067**
	(-1.79)	(-1.76)	(-2.43)	(-2.41)	(-0.11)	(0.31)	(0.37)	(0.23)	(-0.92)	(-0.82)	(2.87)	(2.09)
Constant	0.345***	0.360***	0.367***	0.383***	0.296*	0.331	0.095**	0.088**	0.127**	0.118**	-0.019	-0.037
	(4.69)	(4.71)	(4.55)	(4.65)	(1.92)	(1.58)	(2.33)	(2.21)	(2.58)	(2.43)	(-0.42)	(-1.49)
$R-sq.$	0.16	0.15	0.18	0.19	0.17	0.19	0.16	0.20	0.18	0.24	0.26	0.43
Obs./Countries	576/55	470/50	442/39	370/36	134/16	100/14	589/55	483/50	455/39	383/36	134/16	100/14
Controlling for inflation												
Fixed	-0.027	-0.028	-0.034	-0.035	-0.118	-0.181	-0.012	-0.005	-0.024	-0.016	-0.016	-0.038
	(-0.57)	(-0.59)	(-0.58)	(-0.63)	(-0.79)	(-1.33)	(-0.36)	(-0.15)	(-0.68)	(-0.47)	(-0.26)	(-0.76)
Crisis	0.045*	0.042	0.032	0.032	0.091***	0.097**	0.019*	0.013	0.015	0.005	0.010	4E-04
	(1.95)	(1.59)	(1.07)	(0.94)	(4.41)	(2.56)	(1.71)	(1.27)	(1.12)	(0.42)	(0.69)	(0.01)
kaopen	-0.106**	-0.111**	-0.138**	-0.141**	-0.057	-0.014	0.013	0.011	-0.026	-0.023	0.053**	0.047
	(-2.14)	(-2.16)	(-2.45)	(-2.43)	(-0.44)	(-0.08)	(0.62)	(0.53)	(-0.88)	(-0.75)	(2.32)	(1.31)
inflation	-0.112	-0.121	-0.048	-0.066	-0.346	-0.340	0.065*	0.066*	0.128**	0.124**	-0.067	-0.102
	(-1.26)	(-1.29)	(-0.47)	(-0.60)	(-1.52)	(-1.43)	(1.71)	(1.79)	(2.42)	(2.27)	(-0.97)	(-1.55)
Constant	0.387***	0.405***	0.379***	0.398***	0.527**	0.548**	0.071*	0.065*	0.097**	0.090**	0.025	0.027
	(6.11)	(6.08)	(5.25)	(5.32)	(2.74)	(2.12)	(1.79)	(1.67)	(2.24)	(2.13)	(0.47)	(0.62)
$R-sq.$	0.16	0.16	0.18	0.18	0.21	0.22	0.17	0.21	0.20	0.25	0.26	0.44
Obs./Countries	576/55	470/50	442/39	370/36	134/16	100/14	589/55	483/50	455/39	383/36	134/16	100/14

Notes: Robust t-statistics in parentheses. *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

C. Figures

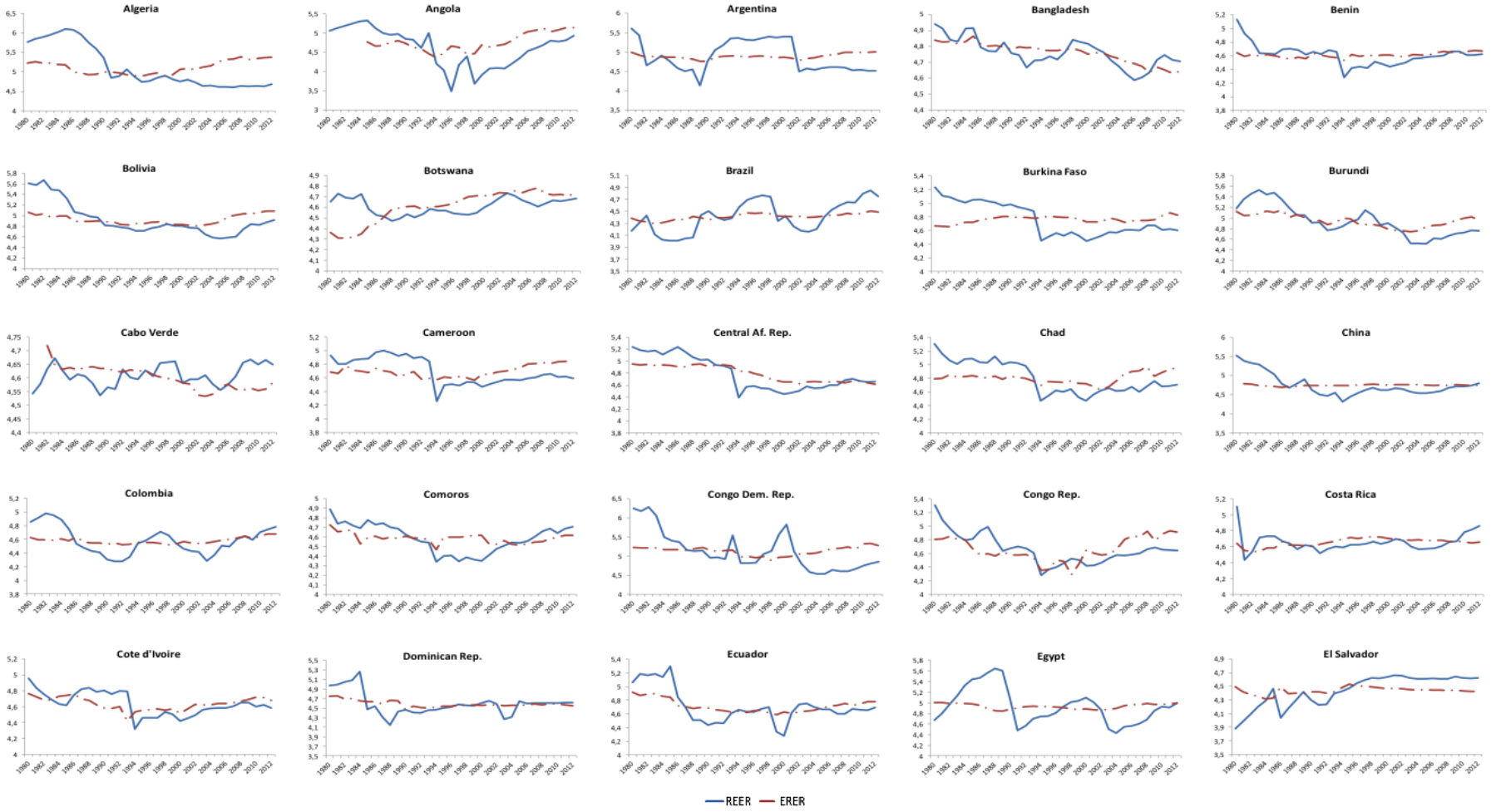

Figure C.1 — Real and Equilibrium Effective Exchange Rate (REER and ERER)
Note: An increase (resp. decrease) of the real effective exchange rate indicates an appreciation (resp. depreciation).

Figure C.1 — *Continued.*

Note: An increase (resp. decrease) of the real effective exchange rate indicates an appreciation (resp. depreciation).

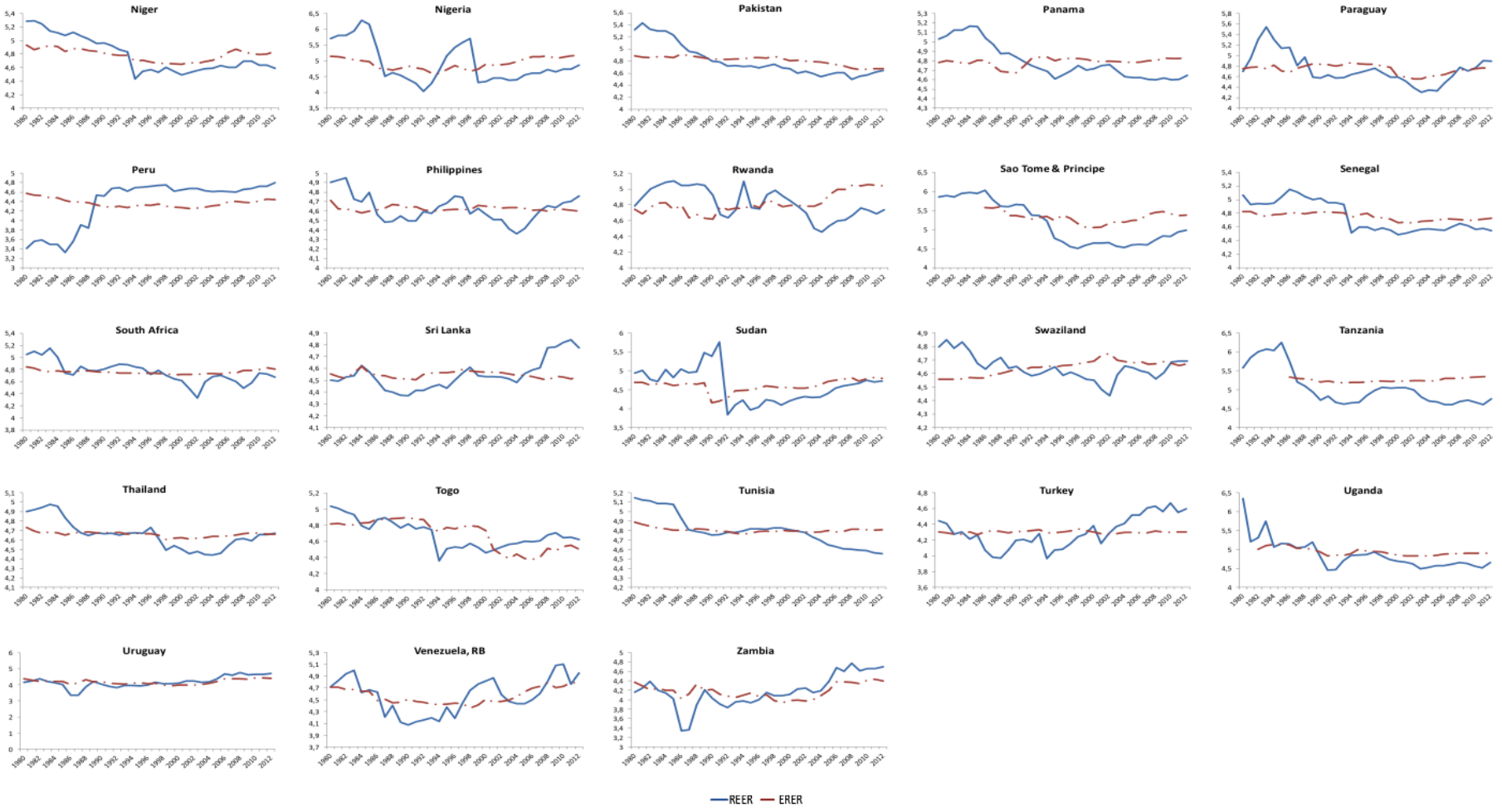

Figure C.1 — *Continued.*

Note: An increase (resp. decrease) of the real effective exchange rate indicates an appreciation (resp. depreciation).

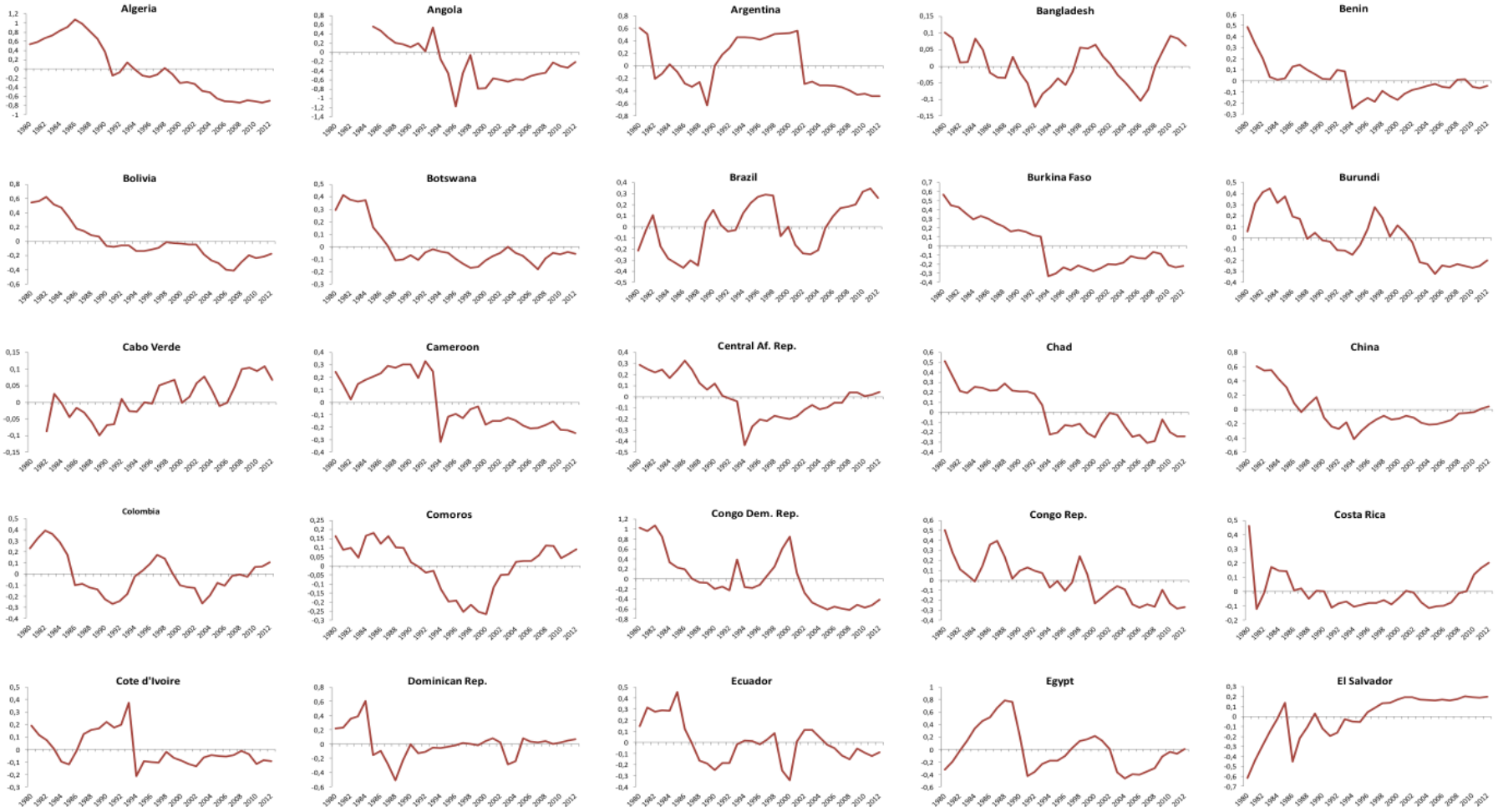

Figure C.2 — Currency misalignments

Note: A positive (resp. negative) value corresponds to an overvaluation (resp. undervaluation)

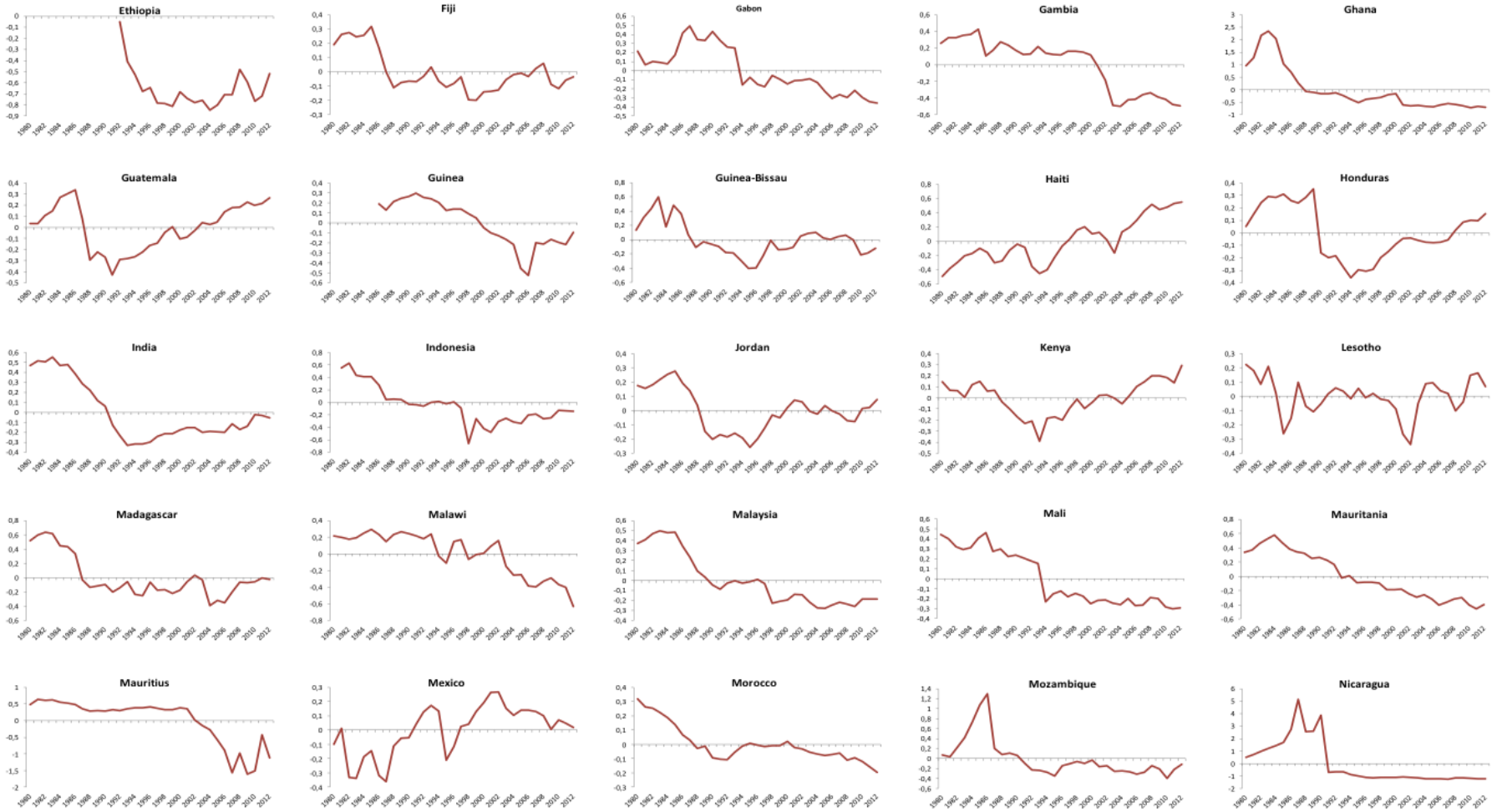

Figure C.2 — *Continued.*

Note: A positive (resp. negative) value corresponds to an overvaluation (resp. undervaluation)

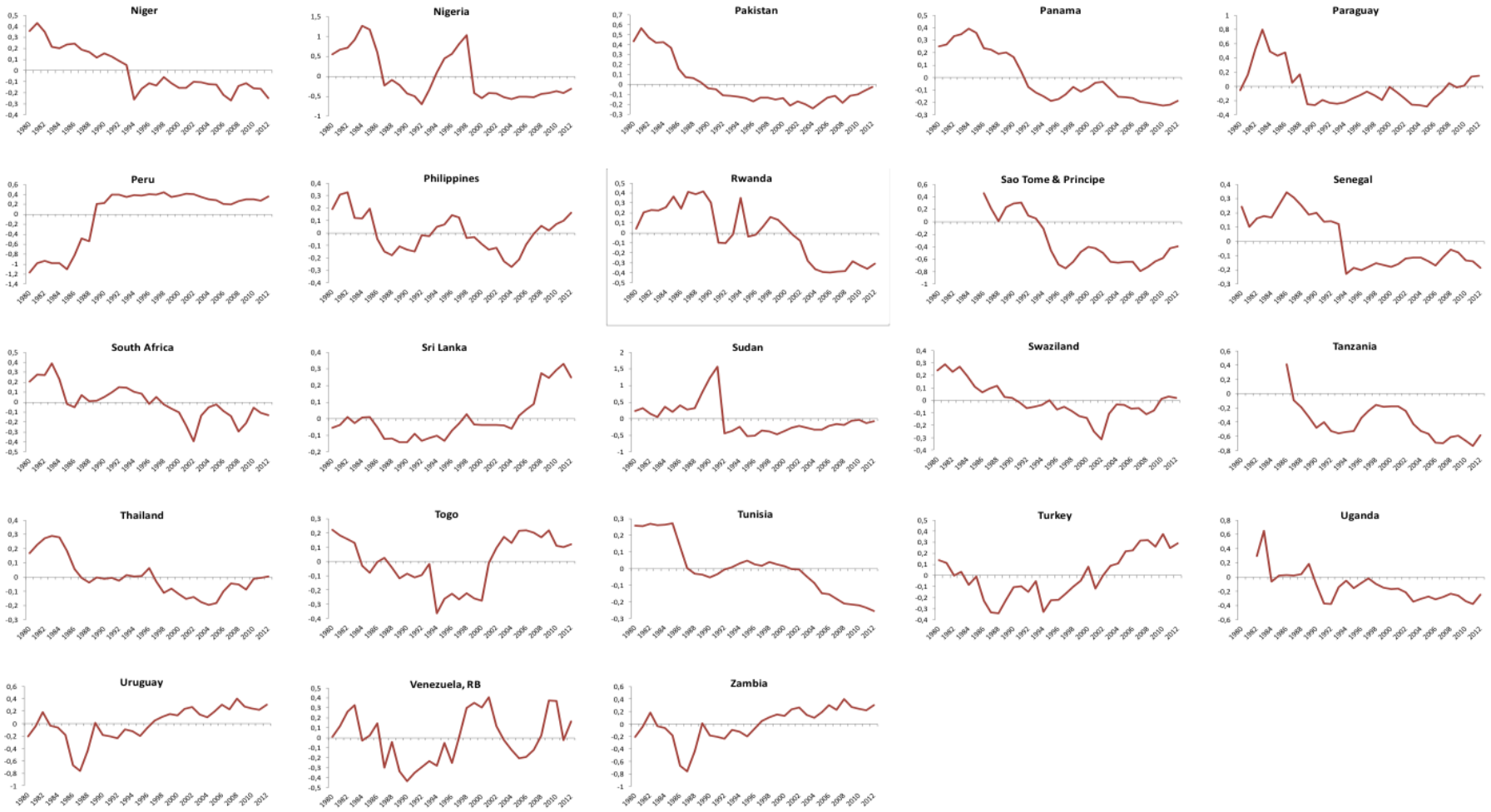

Figure C.2 — *Continued.*

Note: A positive (resp. negative) value corresponds to an overvaluation (resp. undervaluation)