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Independent Evaluation Office
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BACKGROUND PAPER



BP/21-01/05

Exchange Rate Adjustment and Growth in IMF-Supported Programs

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June 30, 2021

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ABBREVIATIONS

AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
BOP	Balance of Payment
CA	Current Account
EM	Emerging Markets
EMPI	Exchange Market Pressure Index
ERR	Exchange Rate Regime
ERPT	Exchange Rate Pass-through to Inflation
GRA	General Resources Account
LIC	Low-income Country
MB	Monetary Base
NEER	Nominal Effective Exchange Rate
NER	Nominal Exchange Rate (Bilateral)
NFA	Net Foreign Assets
PRGT	Poverty Reduction and Growth Trust
REER	Real Effective Exchange Rate
ROC	Review of Program Design and Conditionality
TA	Technical Assistance
TOT	Terms of Trade

EXECUTIVE SUMMARY

This paper examines how exchange rate policy has been used as a tool to support external adjustment and growth in IMF-supported programs over the period 2008–19.

Exchange rate regime transitions. Transitions in the exchange rate regime during programs in the evaluation period were relatively rare. Those that occurred were mostly between intermediate and flexible regimes, more often towards greater fixity rather than greater flexibility, and not more durable compared to transitions outside of programs. The gravitational pull towards intermediate regimes often reasserted itself after short episodes of floating owing to concerns for debt sustainability, balance sheet risks, pass-through to inflation in the absence of an alternative inflation anchor, and the difficulties of operating a more market-based exchange market.

Exchange rate developments. Efforts were typically made to address cases of significant pre-program overvaluation, but other than in these cases improvements in competitiveness were quite limited. The impact of nominal exchange rate movements on the real effective exchange rate (REER) was partially muted by pass-through to prices. About a quarter of programs achieved a depreciation of the real effective exchange rate of greater than 4 percent, many occurring during a currency crisis. A significant clustering of changes in the REER around zero during programs suggests that changes in exchange rate competitiveness were not frequently achieved to ease the adverse impact of external adjustment on growth. Many PRGT programs showed more of a tendency towards a loss of competitiveness.

REER, external adjustment, and growth. REER depreciation, where achieved, seems to have on average supported external adjustment particularly in GRA programs. Larger REER depreciation is on average associated with higher growth in PRGT programs and GRA programs other than crisis programs. GRA programs preceded by high exchange market pressure had significantly worse growth outcomes during the first year of the program, while no such evidence is found for PRGT programs.

Lessons. The evidence and analysis presented in this paper suggests that the exchange rate tool could be used more actively as a means to support growth outcomes while achieving external adjustment, although the ground would need to be well prepared. This lesson is particularly relevant for PRGT and GRA programs other than crisis programs, where cases that did achieve sizeable REER depreciations saw significant growth benefits, including from stronger export performance. However, policies to contain the inflationary impact of depreciation and a monetary policy framework that anchors inflation expectations are required to ensure the effectiveness of the exchange rate as a policy tool, especially in PRGT programs.

Where significant REER depreciation has been achieved, it has followed various paths depending on country circumstances—e.g., regime transition towards greater flexibility; more aggressive use of flexibility available under intermediate regimes; and internal devaluation under exchange rate pegs. The most effective route will be an upfront currency adjustment, although care will be needed to ensure that any depreciation is consistent with members' obligations under Article IV

to avoid manipulating exchange rates in order to prevent effective BOP adjustment or to gain an unfair competitive advantage.

Finally, use of the exchange rate as a policy tool would need to take due account of country circumstances and the concerns giving rise to “fear of floating” while respecting the principle that the exchange rate regime choice is ultimately the authorities’ decision. To address obstacles to greater use of the exchange rate tool, there needs to be early attention to: (i) technical issues and related TA support to build functioning foreign exchange markets; (ii) the need to ensure adequate anchors (e.g., build a credible inflation targeting monetary policy regime); and (iii) general fear of floating—concerns about inflation stability, currency mismatches and balance sheet effects, debt dynamics, distributional consequences of exchange rate depreciation, and political resistance.

I. INTRODUCTION

1. This background paper is prepared as part of an IEO evaluation of growth and adjustment in IMF-supported programs. It assesses to what extent exchange rate policy was used in supporting growth and adjustment in recent IMF-supported programs over the period 2008–19.

2. Restoring macroeconomic stability and external viability are critical objectives of IMF-supported programs. At the same time, programs seek to alleviate the adverse effects of external adjustment on growth, consistent with the mandate to provide temporary resources to members to help correct balance of payments (BOP) problems without resorting to measures “destructive of national or international prosperity.” The 2014 Conditionality Guidelines stipulate that while programs should be normally directed at external viability, they should also foster sustainable economic growth.

3. Exchange rate policy provides an instrument to achieve external adjustment while also supporting output. It can do this by encouraging expenditure switching, through adjustment in the relative price between foreign and domestically produced goods. Changes in relative prices have direct impact on demand for domestic and foreign products as consumer and intermediate goods; they can also affect incentives to trade by adjusting prices relative to domestic costs and thus profitability.

4. In advising on exchange rate policy, the Fund respects the member country’s preferred exchange rate regime (ERR) while assessing the consistency of macroeconomic policies under the program with the chosen regime and other policy objectives. The Fund advises the countries on the appropriate exchange rate policy and the exchange rate regime and lends to a country defending a peg or some other type of exchange rate commitment only if such a policy is sustainable (IMF, 2000). Moreover, the Fund oversees whether the member is fulfilling its obligations under the Article of Agreement to avoid manipulating exchange rates in order to prevent effective balance of payments adjustment or to gain an unfair competitive advantage over other members.

5. Different ERRs allow for adjustment of the relative price of foreign and domestically produced goods in different ways. In floating regimes, the exchange rate depreciates as a result of market forces; in intermediate regimes, intervention is used to modify the impact of market forces to steer the exchange rate; and with exchange rate pegs, an adjustment in the peg can be used to reset the exchange rate. With hard pegs or currency unions, changes in relative price can still be achieved through internal devaluation, i.e., a decline in prices and labor costs via lower wage increases or faster productivity growth than in trading partners.

6. In Fund-supported programs, greater exchange rate flexibility can be a useful tool for achieving adjustment and growth objectives, but its use must be balanced against potential costs. These costs include disruptive financial consequences of sudden drops in the exchange rate on balance sheets, currency mismatches, financial stability, and debt sustainability, as well as

the risk of destabilizing inflation expectations, depending on country circumstances and economic structure. Another key consideration is the institutional capacity to operate a flexible ERR supported by a credible monetary policy framework to anchor inflation and how such regimes function when financial markets are shallow.

7. This paper uses three modes of analysis to analyze country experience of exchange rate adjustment during IMF-supported programs; (i) descriptive data analysis; (ii) more formal empirical analysis; and (iii) insights from country case studies. While descriptive data analysis will be the main strategy, country cases will zoom in on the identified relationships on exchange rate flexibility, current account (CA) adjustment, and growth outcomes. Empirical analysis examines the relationship between the REER and growth more rigorously by controlling for other factors affecting growth, drawing on a separate background paper by Kim and others (2021).

8. The evaluation sample used for cross-country analysis consists of 131 IMF-supported programs for 75 countries approved and scheduled to be completed between September 2008 and March 2020.¹ Given our focus on growth and adjustment, those programs with no program conditionality are excluded from the evaluation sample. The sample includes 54 General Resource Account (GRA) programs and 77 Poverty Reduction and Growth Trust (PRGT) programs including blended programs. Programs that went off track and were never fully completed and crisis programs account for 37 percent and 18 percent of the sample, respectively.² In line with the convention adopted by Kim and others (2021), the following definitions apply for program duration in the cross-country analysis, unless otherwise indicated:

- *Convention 1.* If the program is approved in the last quarter of year t , the following year $t+1$ is counted as the first year of the program period; otherwise year t is the first year.
- *Convention 2.* If the program is fully completed in the first quarter of year t , the previous year $t-1$ is considered as the last year of the program period; otherwise, year t is the last year.
- *Convention 3.* For off-track programs, the last year of the program is determined based on the date of the last completed program review while applying Convention 2 above.

9. The remainder of the paper is organized as follows. Section II presents a select literature review on the role of the exchange rate in fostering external adjustment and growth. Section III examines IMF policy on exchange rate adjustment in Fund-supported programs. Section IV looks

¹ The sample includes programs that were subsequently cancelled or went off track and were thus never completed.

² The fully completed programs include the “completed and largely implemented” programs according to the classification used by the 2018 ROC (IMF, 2019b). Kim and others (2021) define crisis programs as GRA programs in the sample which were approved during 2008–09 in response to the global financial crisis (18 programs in total) and four Eurozone programs arranged in response to the European debt crisis. Specifically, the 2008–09 crisis programs include Angola, Armenia, Belarus, Bosnia and Herzegovina, Costa Rica, Dominican Republic, El Salvador, Georgia, Guatemala, Hungary, Latvia, Mongolia, Pakistan, Romania, Serbia, Sri Lanka, and Ukraine. Eurozone programs are Cyprus (2013), Greece (2010 and 2012), Ireland (2010), and Portugal (2011).

into ERR transitions in the program context and discusses growth and adjustment outcomes across regimes. Section V presents the developments in bilateral nominal exchange rate to the U.S. dollar, and in nominal and real effective exchange rates (NEER and REER, respectively) across programs in the evaluation period. Section VI examines the impact of changes in the REER on CA adjustment and growth. The final section concludes by summarizing key findings and providing some lessons.

II. SELECT LITERATURE REVIEW

10. A vast literature looks into the role of the exchange rate in facilitating external adjustment and supporting growth. This section provides a select review of the literature.

11. Friedman's (1953) seminal paper proposed that flexible ERRs spur a faster mean reversion of the CA and correction of imbalances. In most models of open economies, real external shocks—including terms of trade and real interest rate shocks—will result in changes in the equilibrium real exchange rate (Obstfeld and Rogoff, 1995). If the bilateral nominal exchange rate is fixed, the adjustment will have to take place through changes in domestic prices and wages.³

12. Recent empirical studies tested Friedman's hypothesis and most found that flexible exchange rate arrangements deliver a faster CA adjustment, with the notable exception of Chinn and Wei (2013).⁴ Ghosh and others (2019) found that bilateral trade balances adjust significantly faster with increased real exchange rate flexibility. Martin (2016) reported that non-industrial countries under fixed ERRs consistently display higher CA persistence. A study by Gervais and others (2016) based on a large-scale event study of emerging market economies (EMs) concluded that episodes of CA reversals from deficit to surplus are associated with sizeable REER depreciations. Kappler and others (2013) found that the CA balance deteriorates strongly in response to an exchange rate appreciation.

13. Several empirical studies examined the role of exchange rate flexibility in the context of economic crisis or large external shocks, finding that exchange rate flexibility helped to dampen the adverse impact on growth under such circumstances. Devereux and Yu (2017) found that in normal times the impact of alternative exchange rate policies does not differ much but, during a crisis, macroeconomic outcomes are far worse under a pegged ERR. Terrones (2020) reported that while there is no robust long-term relationship between ERRs and growth, there is evidence that fixers recover from global recessions at a weaker pace than floaters. Ghosh and others (2015) examined EM experience and showed that macroeconomic and financial vulnerabilities are significantly greater under less flexible ERRs as compared with floats. Therefore, free floats are least vulnerable to banking or currency crises while hard pegs are more susceptible to growth

³ However, if real wages are rigid owing to wage indexation, i.e., exchange rate pass-through to inflation is high, then exchange rate adjustment may not help to accommodate external shocks (Meade, 1951; Dornbusch, 2001; Kenen, 2002).

⁴ Herrmann (2009); Ghosh and others (2010 and 2013); Clower and Ito (2012); Martin (2016).

collapses given the high costs of and associated reluctance to exiting hard pegs. Dabla-Norris and Bal Gunduz (2012) found that large external shocks in low-income countries (LICs) could trigger growth crises and the likelihood of such crises is significantly higher for fixed ERRs compared to flexible ERRs. Tsangarides (2012) found that while the growth performance was not significantly different for pegs and floats during the crisis, during the recovery period countries with pegs experienced slower growth than countries with floats. In the context of currency unions, Lambertini and Proebsting (2019) found that the output costs of correcting CAs were higher than anticipated in some Euro Area countries during 2010–14 as internal devaluation based on austerity packages were not successful in raising exports. Instead, CA improvements were solely driven by lower imports stemming from faltering domestic demand.

14. Despite these positive findings on the role of exchange rate flexibility in supporting external adjustment and growth, the empirical evidence based on the type of ERR is mixed. Opposing effects through different channels may partly explain these mixed results: the direct shock absorber role of flexible exchange rates versus the indirect impact of exchange rate volatility on investment, international trade, and financial development.⁵ Bailliu and others (2003) pointed to the presence of a monetary policy anchor as a key underlying factor affecting growth outcomes across regimes: ERRs supported by a credible monetary policy anchor exert a positive influence on economic growth regardless of the regime, while intermediate/flexible regimes without an anchor are detrimental for growth.

15. Relatedly, a number of studies have sought to estimate exchange rate pass-through to inflation (ERPT), which affects both macroeconomic stability and the efficacy of nominal exchange rate depreciations in generating significant real exchange rate adjustments. ERPT itself is influenced by the monetary policy regime (Taylor, 2000): maintaining low and stable inflation reduces ERPT, which in turn sustains low inflation and helps stabilize inflationary expectations. The estimates for the ERPT in developing countries range from 0.1-0.5, with inflation inertia tending to be lower in LICs compared to EMs. Razafimahefa (2012) estimated that the average ERPT of SSA countries declined sharply from 0.97 to 0.44 since the mid-1990s following marked improvements in macroeconomic and political environments. Using a sample of 71 developing countries, Choudhri and Hakura (2006) reported an average ERPT estimate of 0.15-0.27 while also noting that estimates varied by inflation regimes, ranging from 0.12-0.22 (low inflation) to 0.30-0.52 (high inflation).

⁵ The stronger growth impact of fixed ERR is often premised on the assumed discipline and predictability associated with such regimes (Mundell, 1995, and Calvo, 2000a; 2000b). Gylfason (2000) argues that macro stability imposed by pegging promotes foreign trade. Moreno (2001) suggests that greater openness eases technology transfer, therefore, aids productivity growth. De Grauwe and Schnabl (2004) point to higher growth under pegs owing to the elimination of exchange rate risk and lower country risk premium than floats. Other studies that find adverse effects of exchange rate volatility on trade include Brada and Mendez (1988), Nilsson and Nilsson (2000), and Domac and others (2001). Ghosh and others (2002) find a positive relationship between fixed exchange rate regimes and economic growth while GDP volatility is higher under fixed regimes.

16. In earlier studies, use of data based on the de jure (announced official) classification, as opposed to the de facto classification, also gave rise to ambiguous results.⁶ Highlighting the difference between de jure and de facto classifications, Calvo and Reinhart (2002) found that countries that report that they allow their exchange rate to float mostly do not in practice, and pointed to an epidemic of fear of floating, i.e., resistance to large currency swings. Results varied across studies using de facto ERR. Several studies pointed to higher growth under flexible regimes for developing countries (Levy-Yeyati and Sturzenegger, 2003; Bleaney and Francisco, 2007), emerging market economies (Bailliu and others, 2001; Coudert and Dubert, 2005; Gervais and others, 2016), and advanced economies (Rogoff and others, 2003). Frankel and others (2019) found that economic growth is significantly positively correlated with the intermediate ERR and the impact is more significant for LICs. Eichengreen and Rose (2012) reported that economies with a narrow crawling band ERR grow significantly faster than those with fixed regimes. Aghion and others (2009) found that a flexible ERR supports growth in countries with more developed financial systems. Kassa and Lartey (2018) and Husain and others (2005) found that increased exchange rate flexibility has a negative impact on GDP growth in emerging and developing countries, an effect which fades with higher levels of financial development, income level, and trade openness.

17. Yet other studies have found no relationship between ERR and growth (e.g., Rose, 2011). Huang and Malhotra (2005) found a positive impact only for developing economies under fixed regimes and managed floats while no effect for developed economies. Petreski (2008) pointed to methodological problems (no treatment of endogeneity of the regime choice and macroeconomic outcomes or inappropriate instruments) as another factor explaining mixed results in the empirical studies.

18. A separate strand of literature has focused on the impact of exchange rate overvaluation or undervaluation on long-term growth, and has found that growth accelerations are often associated with real exchange rate depreciations.⁷ Learning-by-doing externalities in exports, a mechanism through which exporting improves the productivity of domestic firms (Atkin, Khandelwal, and Osman, 2017), suggest that undervaluation can provide an effective subsidy to the more efficient tradable sector.⁸ These findings at least call for being vigilant about the long-term growth impact of overvaluation for developing countries.

19. More recent literature has shown that dominant currency invoicing (Gopinath, 2017) and increasing importance of global value chains (Adler and others, 2019) has weakened the link between real exchange rate adjustment and trade flows.⁹ Casas and others (2017) reported that

⁶ Ghosh and others (1997).

⁷ Hausmann and others (2005) and Rodrik (2008).

⁸ Aizenman and Lee (2010); Benigno and others (2015); McLeod and Mileva (2011).

⁹ Adler and others (2019) also find that greater value chain integration is associated with larger gross trade flows, relative to GDP, which tends to amplify the effect of exchange rate movements. They, therefore, conclude that for most countries, the benefits of exchange rate flexibility in facilitating external adjustment remain.

most trade is invoiced in a very few dominant currencies, although the standard Mundell-Fleming open economy macro-model and its many variants typically assume pricing in either the producer's currency or in local currency. They found that pricing in a dominant currency, such as the US dollar, leads to high exchange rate pass-through of the dominant currency into export and import prices while exchange rate pass-through of non-dominant currencies is limited. Under this pricing behavior, expenditure switching occurs mostly via imports, driven by the exchange rate against the dollar, while exports respond more slowly, through improvements in cost competitiveness and export profitability.

20. In conclusion, the relationship between exchange rate adjustment, ERR, stabilization and output is complex, and will vary depending on country circumstances, including the level of development, institutional capacity, and exposure to real or financial shocks.

III. REVIEW OF EXCHANGE RATE POLICY IN IMF-SUPPORTED PROGRAMS

21. A fundamental principle of the Fund's advice on exchange rate policy in both the program and non-program context is to respect the authorities' choice of ERR, while seeking to ensure consistency with the broader macroeconomic policy framework.¹⁰ Consistent with this approach, policy reviews conducted by the IMF have generally found that shifts in ERRs at the outset of a Fund-supported program are the exception rather than the norm. The 2004 review of "The Design of Fund-Supported Programs" concluded that there was great persistence in ERRs, which were seldom changed as part of IMF-supported programs (IMF, 2004). The analysis found that regime transitions occurred in only about 11 percent of cases and were generally towards greater flexibility in non-transition GRA-supported programs while towards less flexible regimes in transition economies.¹¹

22. The 2009 "Review of Recent Crisis Programs" provided some insights into the IMF's view on the issue of exchange rate policy in the context of Fund-supported programs (IMF, 2009). The review emphasized that within the parameters of an IMF-supported program, it is necessary for the choice of ERR to underpin the credibility of the adjustment strategy. However, it recognized that in instances when a change of regime might be seen as warranted to unwind large currency misalignments, such changes were often contentious partly because of the difficulty in weighing the cost and benefits, including for example the implications of currency depreciations that could entail losses from foreign exchange exposures in private balance sheets.

¹⁰ Under the Articles of Agreement of the IMF, "... exchange arrangements may include ... other exchange arrangements of a member's choice;" "the Fund ... may make provision for general exchange arrangements without limiting the right of members to have exchange arrangements of their choice consistent with the purposes of the Fund and the obligations under Section 1 of this Article" (Article IV, Section 1 and 2).

¹¹ Transition economies refer to Central and Eastern European economies, the Baltics and the Commonwealth of Independent States that started transformation from a centrally planned economy into a market economy in early 1990s.

23. The 2009 review noted that in real terms, currency depreciations after the global financial crisis had been strikingly more moderate than in past crises and with little differentiation between program and nonprogram countries. The 2011 Review of Conditionality found that Fund-supported programs were typically associated with minimal REER movements (IMF, 2012a, 2012b, 2012c, and 2012d). Furthermore, it partly attributed below par growth outcomes in the euro area program countries with attempts at strengthening competitiveness through internal devaluation with limited progress.

24. The 2015 “Review of Crisis Programs” again noted that external adjustment in IMF-supported programs in the period under review did not entail significant adjustments in the real exchange rate, both in programs with countries belonging to currency unions and in those with independent exchange rates (IMF, 2015). The 2015 review specifically highlighted that exchange rate adjustment was relied on less to complement expenditure reduction in adjustment compared to previous episodes even though a number of countries had moved towards greater flexibility in the period immediately following the crisis.

25. Recent reviews by the IMF have also highlighted the challenges of achieving adjustment through internal devaluation. The 2015 review concluded that for recent GRA programs, internal devaluation was expected to contribute more to external adjustment than exchange rate movements, but this proved hard to achieve within a short period. In addition, the report noted that internal devaluations in recent programs achieved only modest real exchange rate adjustment, although where they did, there was some evidence of a nascent growth impact.

26. The 2018 Review of Program Design and Conditionality (ROC) found that external adjustment often proved to be better than envisaged—typically due more to significant import compression rather than stronger export growth (IMF, 2019a, 2019b, and 2019c). The report attributed weak average export growth to lower-than-expected external demand and difficulties in achieving external adjustment under fixed ERRs and currency unions, noting that two-thirds of GRA program countries had non-floating exchange rates. Otherwise, coverage of exchange rate issues was limited, with no discussion of exchange rate developments, regime transitions, and the use of the exchange rate tool in programs.

27. Recent work on an Integrated Policy Framework in the context of managing volatile capital flows has pointed to the significant benefits of flexible exchange rates for absorbing shocks (IMF, 2020). In countries with flexible exchange rates, deep foreign exchange markets and continuous market access, allowing full exchange rate adjustment to economic and financial shocks is typically optimal for dealing external shocks. However, acknowledging the presence of frictions and vulnerabilities common in emerging market and frontier LICs, the report suggested that while flexible exchange rates continue to provide significant benefits, other tools (macroprudential measures, capital flow management measures, and foreign exchange intervention) can play a useful role, the optimal combination depending on the nature of shocks and country conditions. The report also highlights that these tools should not be used to support a misaligned exchange rate.

IV. EXCHANGE RATE REGIME TRANSITIONS IN IMF-SUPPORTED PROGRAMS

28. This section looks at evidence on ERR transitions during both program and non-program periods. The latter covers all years for countries that had no IMF-supported programs over 2008–19 as well as the non-program years for countries that were included in the evaluation sample.

Exchange rate regime classification

29. The ERR classification is based on de facto exchange rate arrangements of 189 countries from the IMF’s database on the Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) over January 2008–April 2019. The AREAER database classifies ERR into four broad categories: hard pegs, soft pegs, floating arrangements and a residual category (Habermeier and others, 2009). These broad categories comprise 10 subcategories. For example, soft pegs include 5 subgroups while floating and hard pegs each contain 2 subgroups.

30. As a basis for data analysis, an ERR flexibility score is derived by assigning values (1-10) to the 10 subcategories from the AREAER approach, with a value of 1 assigned to the least flexible subgroup “exchange arrangement with no separate legal tender” and a value of 10 assigned to free floating. In addition, these 10 fine-grained categories in the AREAER are mapped into 3 broader categories of ERR (Table 1): fixed (1-3), intermediate (4-8) and floating (9-10). While conventional pegs are included in the soft peg category under the Fund’s approach, they are included under a fixed regime for our analysis. Other soft pegs and the residual category of other managed arrangement are included under the intermediate regime. The flexible regime is the same as in the AREAER methodology.

Broad Categories	Score	Fine categories
Fixed	1	No separate legal tender
	2	Currency board
	3	Conventional peg
Intermediate	4	Stabilized arrangement
	5	Crawling peg
	6	Crawl-like arrangement
	7	Pegged exchange rate within horizontal bands
	8	Other managed arrangement
Flexible	9	Floating
	10	Free floating

Sources: The IMF’s AREAER database and the authors’ classification of broad categories.
 Note: AREAER classifies exchange arrangements of the members of a monetary or currency union under the arrangement governing the joint currency. In this study, the Euro Area members are treated as a member of a currency union (with no separate legal tender) for analytical purpose, although their ERR is classified as a float in the AREAER.

Exchange rate regime transitions over 2008–19

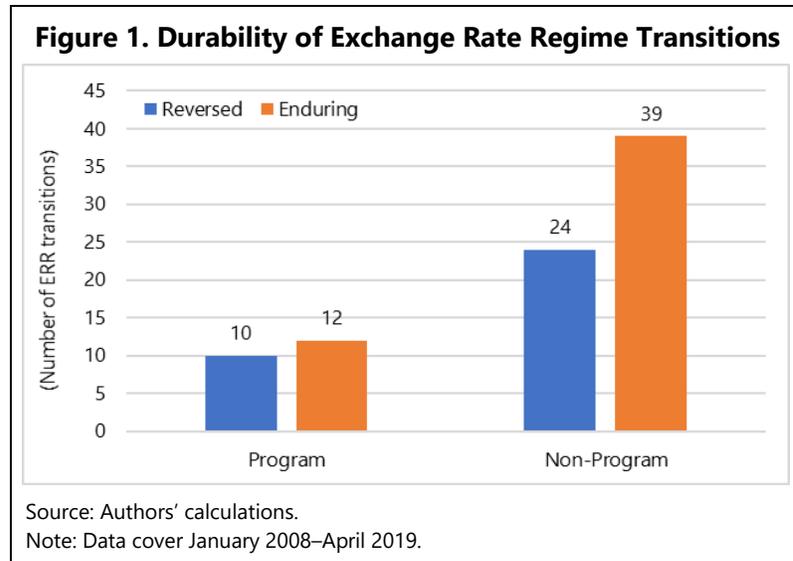
31. Consistent with earlier reviews, transitions in the ERR in the program context were relatively rare over the evaluation period. Based on the broad regime classification, out of 131 programs in the evaluation sample, there were only 22 instances of regime transition (10 in GRA and 12 in PRGT programs) occurring in the program context (21 during the program period and one—Egypt (2016)—shortly before program approval as a prior action). Of these transitions, only 6 (5 GRA and 1 PRGT) were towards greater flexibility (all from intermediate to flexible regimes), suggesting that fear of floating may have prevailed even in the program context.¹² All transitions toward greater fixity were from flexible to intermediate regimes, except for two small states (São Tomé and Príncipe, Solomon Islands) which moved from intermediate to fixed regimes.

32. The experience discussed in several country case studies prepared for the evaluation illustrates the fear of floating and associated risks that deterred greater and more sustained use of changes in ERR. In a number of case studies, the gravitational pull towards intermediate regimes reasserted itself after short episodes of floating owing to the authorities' concerns for debt sustainability, balance sheet risks, pass-through to inflation as an alternative inflation anchor failed to be established, and the difficulties of operating a more market-based exchange market. Even in cases that successfully transitioned to a floating ERR, fear of floating delayed the regime change. For example, in Jamaica's 2010 program the authorities initially pushed against Fund advice for greater flexibility due to concerns for pass-through to inflation, lack of national support, and delayed responsiveness of exports to the exchange rate. Jamaica's 2013 program included commitments to exchange rate flexibility, measures to develop fully the interbank foreign exchange market, and further steps towards a full-fledged inflation targeting regime. Helped by these measures, Jamaica eventually shifted to a floating regime in 2017 during the 2016 successor program.

33. Country experience in some case studies clearly highlights that active use of the exchange rate as a policy tool needs good technical preparation—in particular to establish a credible monetary policy regime to provide an alternative inflation anchor and consistent macroeconomic policy settings and to develop a liquid and well-functioning foreign exchange market. Provision of effective and timely TA to support transition to greater flexibility was critical, but often not sufficient.

34. Most program countries with no regime transition were under the intermediate regimes. Slightly less than half of regime transitions during a program had at least one subsequent reversal within three years, leaving the total number of programs with enduring regime transitions at 12 (Figure 1). Transitions during programs were relatively less durable compared to transitions outside of programs.

¹² These six instances are Armenia, Egypt, Georgia, Jamaica, Malawi, and Sri Lanka. However, Armenia, Egypt, Malawi, and Sri Lanka subsequently shifted back to intermediate regimes. Indeed, only Georgia and Jamaica still maintain a floating currency (since 2013 and 2017, respectively).



35. The infrequency of regime transition is not unique to program periods. Drawing on the approach used by Masson (2000), regime transition probabilities were estimated for a sample of 192 countries for 2008–18. Estimated probabilities are broadly similar between program and non-program periods and exhibit a strong tendency for status quo (Table 2, Panels A and B). A notable exception is the transition probability from flexible to intermediate regimes, which is two times higher in the program period (10.7 percent) than in the non-program period (5.3 percent). Accordingly, the probability of staying in a flexible regime was actually lower in the program period (89.3 percent) than in the non-program period (94.7 percent). Within program periods, the results show that regime transition towards greater flexibility was more likely in GRA programs than in PRGT programs, while the opposite was the case for transition towards greater fixity (Table 2, Panels C and D).

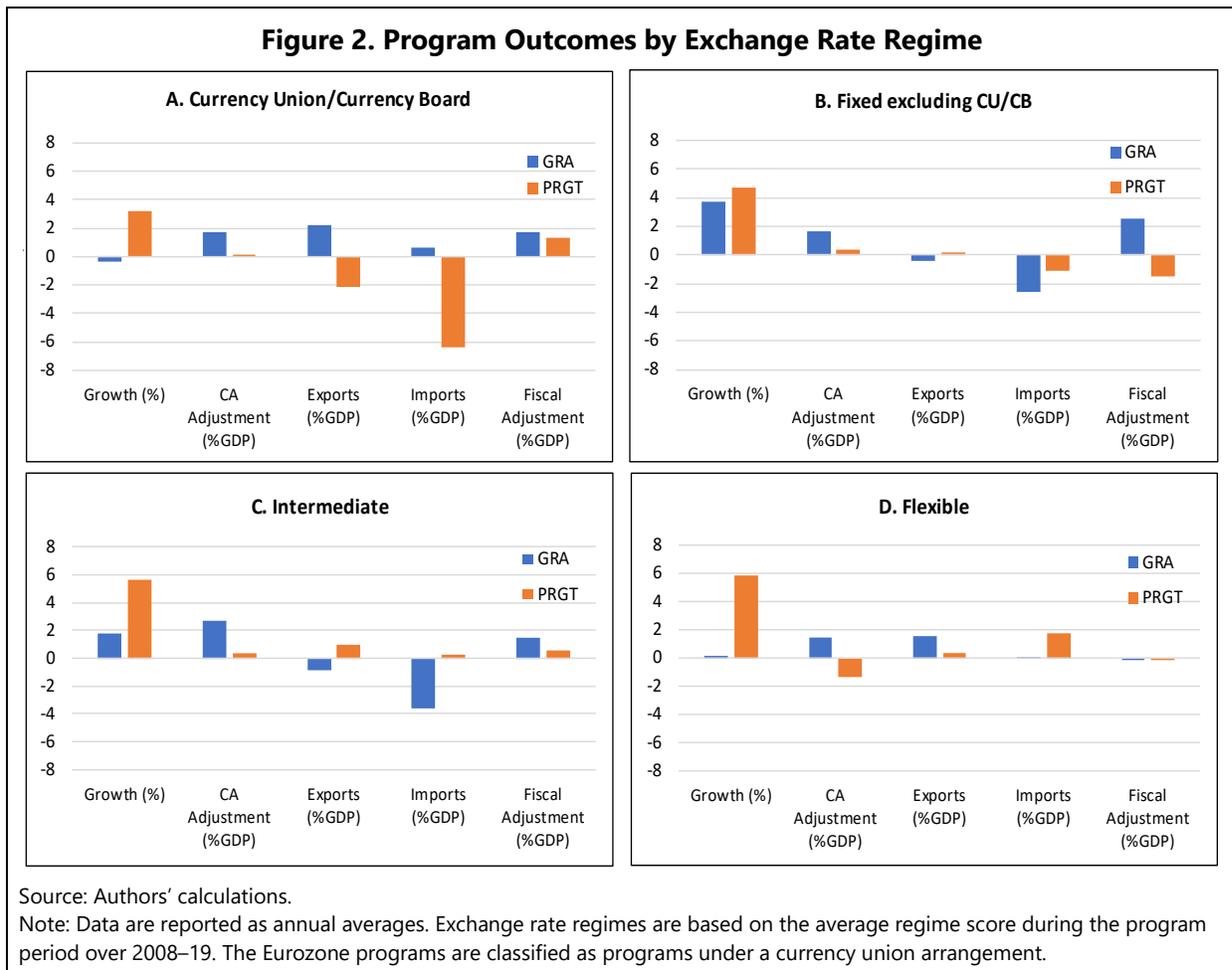
Table 2. Exchange Rate Regime Transition Probability, 2008–18 (In percent)

	A. Program Period			B. Non-Program Period		
	Fixed	Intermediate	Flexible	Fixed	Intermediate	Flexible
Fixed	100.0	0.0	0.0	98.2	1.1	0.7
Intermediate	2.1	93.8	4.1	1.1	94.4	4.5
Flexible	0.0	10.7	89.3	0.0	5.3	94.7
	C. GRA Programs			D. PRGT Programs		
	Fixed	Intermediate	Flexible	Fixed	Intermediate	Flexible
Fixed	100.0	0.0	0.0	100.0	0.0	0.0
Intermediate	0.0	89.7	10.3	2.9	95.6	1.5
Flexible	0.0	8.2	91.8	0.0	12.9	87.1

Source: Authors' calculations.
Note: Each entry in the matrix represents the probability of transition from the regime in the row to the regime in the corresponding column in any given year between 2008 and 2018. Program period covers each program year in the evaluation sample. "Non-program Period" covers the non-program periods of both program and non-program countries.

36. Data from the finer regime classification in the AREAER database also suggest a tendency toward greater fixity rather than greater flexibility. Specifically, the average regime score during the program period was lower (i.e., closer to fixity) than the corresponding score for the initial regime prior to the program, particularly in PRGT programs that operated under intermediate regimes.

37. A simple comparison of growth outcomes for programs with different ERRs provides some evidence that more flexible regimes were associated with somewhat stronger growth performance in PRGT programs. For these programs, growth was on average higher for countries under intermediate and flexible regimes than under fixed regimes (including currency union and currency board arrangements), while import compression was particularly pronounced in countries under the hardest peg (currency union, currency board) (Figure 2). In GRA programs, interestingly, growth during the program was on average highest under fixed regimes (Panel B) and lowest and negative under the hardest peg (Panel A).¹³



¹³ Small sample size poses a problem though as only three GRA programs were under fixed regimes excluding currency union or currency board arrangements while each of the other regimes included 13–17 programs.

38. GRA programs achieved an average CA adjustment of 1.5–2.7 percent of GDP per year during the program period. The largest adjustment took place under intermediate regimes through import compression while flexible regimes achieved adjustment mainly through higher exports. In all but flexible regimes, CA adjustment was accompanied by significant fiscal adjustment as well. On the other hand, both average CA and export adjustments were limited in PRGT programs. CA deficits widened under flexible regimes with rising imports. Fiscal adjustment was limited or negative except for the countries with the hardest pegs, which also experienced severe import compression as well as a decline in exports.

V. DEVELOPMENTS IN EXCHANGE RATES DURING IMF-SUPPORTED PROGRAMS

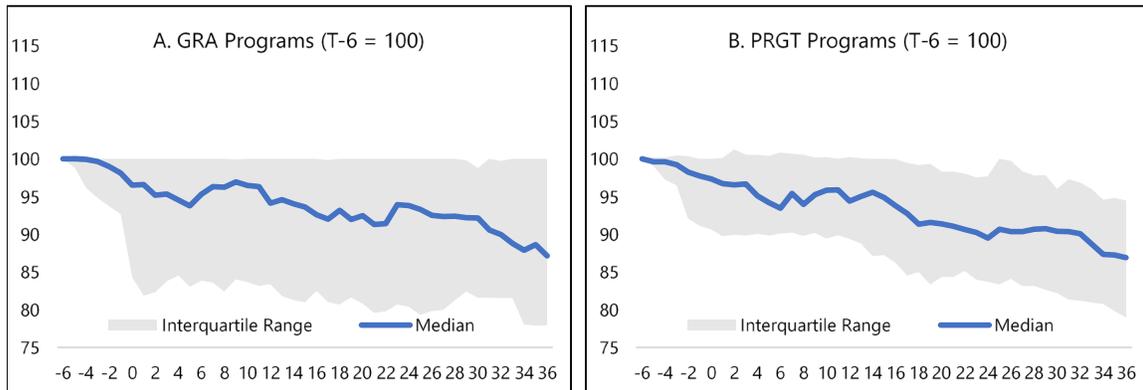
39. This section first looks at higher-frequency developments in bilateral nominal exchange rates to capture the dynamics before and in the early phase of the program when movements are likely to be more pronounced than later in the program, particularly for countries facing sharp reversal in capital flows. It then examines how bilateral nominal exchange rate movements were translated into adjustments in NEERs and REERs and concludes with an analysis of exchange rate pressures prior to programs.

Developments in the bilateral nominal exchange rate

40. IMF-supported programs have typically involved a significant nominal depreciation against the US dollar. Specifically, the bilateral nominal exchange rate vis-à-vis the U.S. dollar (NER) depreciated by on average about 13 percent over the period between T-6 (6 months prior to program approval) and T+36 (36 months after program approval) in both GRA and PRGT programs (Figure 3). Cross-country variation is significantly larger in GRA programs than in PRGT programs, as indicated by the interquartile range in shade. It is notable, albeit not surprising, that NER depreciation prior to program approval was quite sharp for the GRA programs in the bottom quartile, many of which were exceptional access and crisis programs. In contrast, for a quarter of GRA programs, the NER remained unchanged (pegged to the US dollar) or appreciated.¹⁴ In PRGT programs, the NER depreciated by more than 5 percent by T+36 in more than three-quarters of programs. While individual country experiences differed widely, it is notable that the depreciation trend on average continued until 36 months after program approval in both GRA and PRGT programs.

¹⁴ GRA program countries in the top quartile that had a US dollar peg are Antigua and Barbuda, Djibouti, El Salvador, Grenada, Iraq, Jordan, and St. Kitts and Nevis.

**Figure 3. Developments in the Bilateral Nominal Exchange Rate
(increase = appreciation)**



Source: Authors' calculations.

Note: The numbers on the horizontal axis represent months from program approval with negative numbers for pre-program period. Data cover January 2008–September 2020.

Developments in the NEER and REER

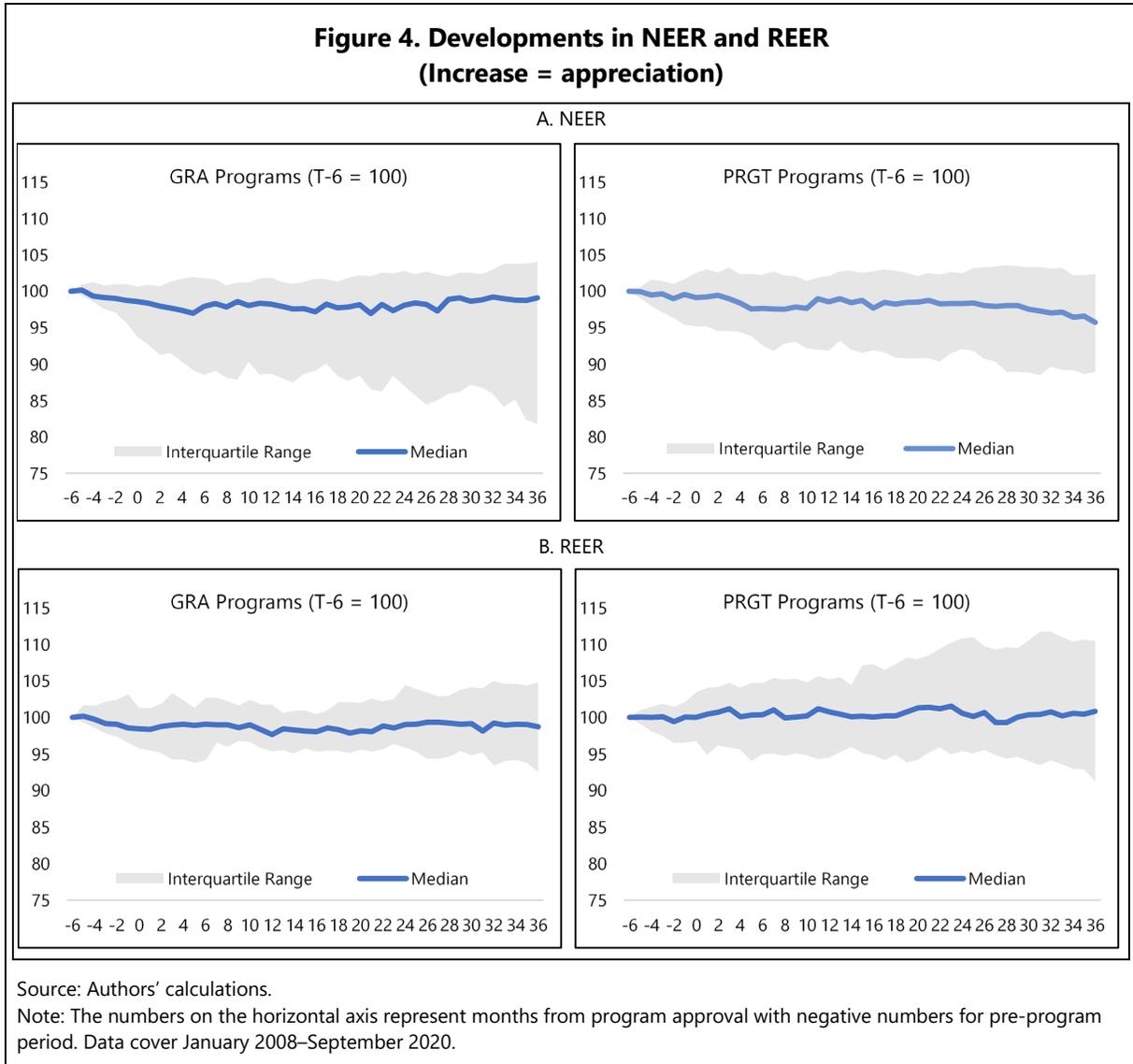
41. Taking into account movements in third currencies, movements in the NEER were on average much more muted than those in the NER, although there was substantial cross-country variation, particularly in GRA programs (Figure 4). The median NEER depreciated by a mere 1 percent and 4 percent by T+36 in GRA and PRGT programs, respectively, while cross-country variation was substantially larger in the former. Nevertheless, for a bottom quartile of GRA programs, the NEER depreciated by 18 percent or more by T+36.

42. Adjusting for inflation differentials, changes in the REER were typically even more modest. The median REER depreciated by only 1.3 percent by T+36 in GRA programs with only limited cross-country variation, only 25 percent of cases had REER depreciations larger than 5 percent. In PRGT programs, the median REER appreciated by 0.8 percent. About a quarter of PRGT programs had a REER appreciation of 10 percent or more by T+36, attributed to higher inflation compared to trading partners. The REER appreciated by more than 5 percent in about a quarter of GRA programs over a similar period.

43. These data are consistent with incomplete pass through of nominal exchange rate changes into changes in the REER, reflecting some impact of exchange rate shifts on domestic prices. Nevertheless, cross-section data for normally completed programs suggest relatively strong bivariate relationships between changes in the NER, NEER, and REER (Figure 5, top panel).¹⁵ For the full sample of completed programs, a 1 percent depreciation in the NER and NEER led, on average, to about 0.6 percent depreciation in the REER (trend lines in red). If the

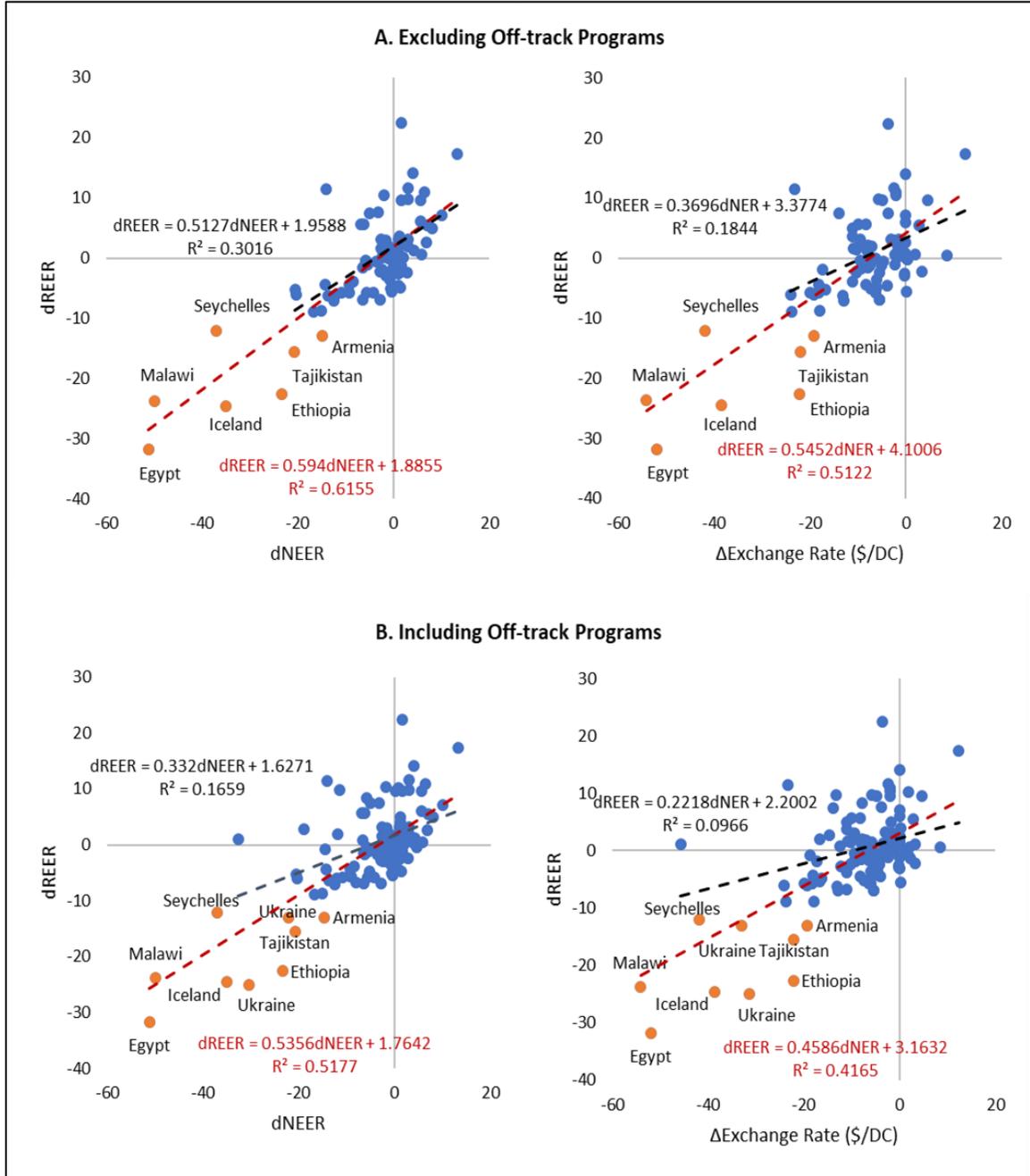
¹⁵ Changes are calculated as the percent change in average REER, NEER, and NER during the programs compared to the 12-month average before approval.

programs with REER depreciation of 10 percent or more (orange dots) are excluded, the estimated impact on the REER drops to 0.5 percent and 0.4 percent for the NEER and NER, respectively (trendlines in black).



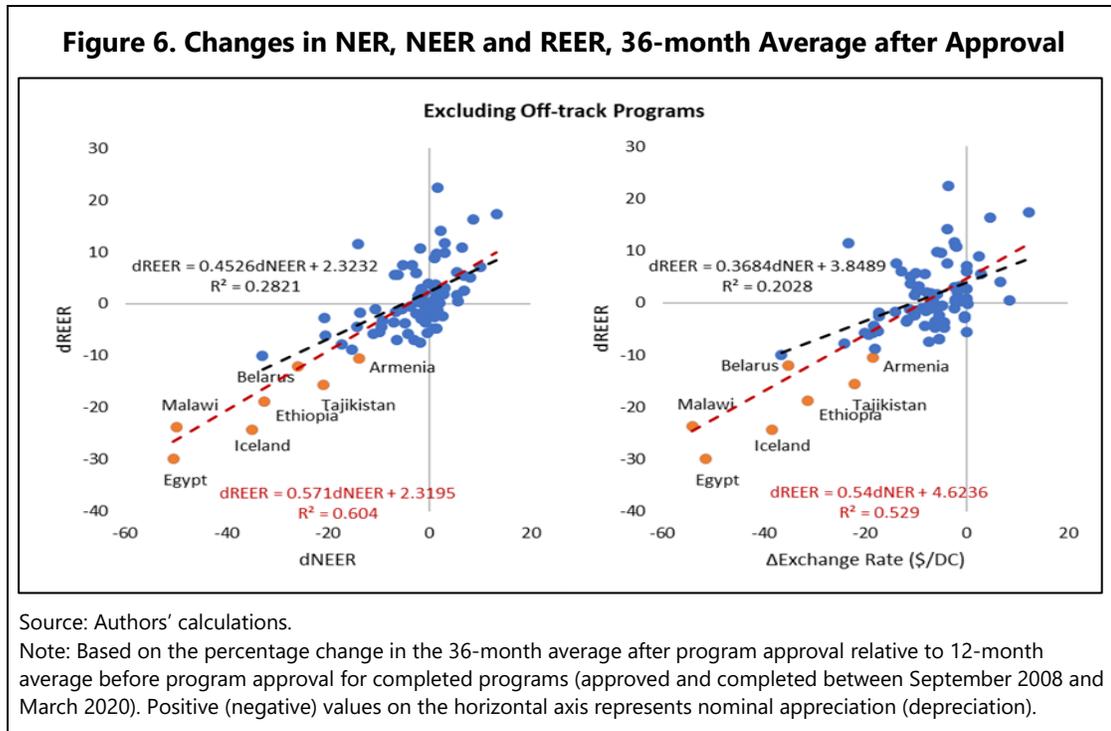
44. The results also show that the estimated average pass-through from the NER and NEER to the REER in off-track programs was significantly weaker, likely reflecting higher inflation owing to policy slippages (Figure 5, bottom panel). In most cases, programs went off-track as the countries failed to meet policy adjustment targets envisaged in programs. As the program duration varied substantially across GRA versus PRGT programs, it is useful look at the average REER after the program approval for a longer common period for all programs, which covers both program and non-program episodes for most GRA program countries. Figure 6 presents change in the 36-month average REER after program approval relative to the 12-month average before approval. The results remain broadly the same.

Figure 5. Changes in NER, NEER and REER



Source: Authors' calculations.

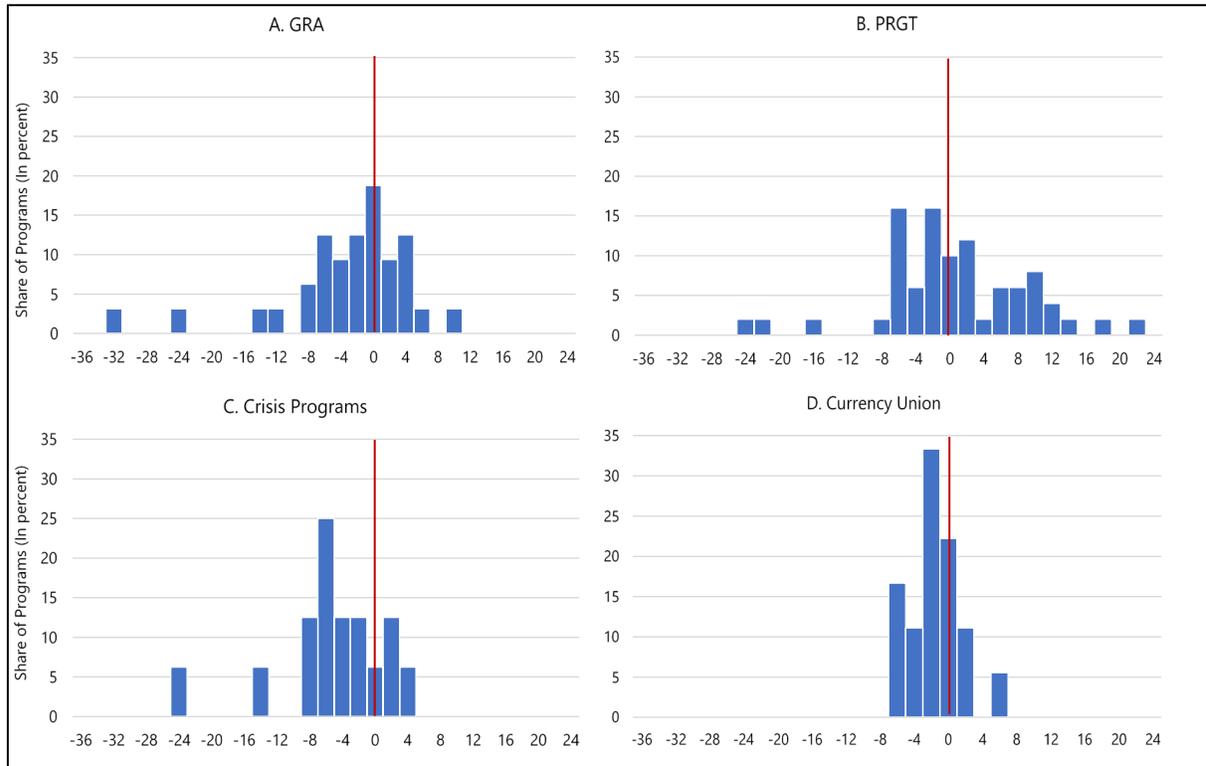
Note: Based on the percentage change in the program average (up to 36 months after approval) relative to 12-month average before approval. Positive (negative) values on the horizontal axis represents nominal appreciation (depreciation). Data cover the programs in the evaluation sample, approved and completed between September 2008 and March 2020.



45. Figure 7 provides a more detailed picture of the distribution of outcomes for the REER across GRA and PRGT programs. Overall, about one quarter of programs achieved a depreciation of the REER of 4 percent or more. REER depreciation was generally larger in GRA programs than in PRGT programs; in the latter group, changes in REER were more skewed to appreciation with a quarter of programs having REER appreciation above 5 percent (Figure 7, top panels). In contrast, a majority of GRA programs had some REER depreciation, which exceeded 4 percent for 28 percent of programs, mostly crisis programs.¹⁶ REER movements towards depreciation were more limited for members of currency unions (Figure 7, bottom right panel), although three countries in currency unions (Benin, Burkina Faso, Senegal) did manage to achieve a REER correction of 5–7 percent through a combination of “internal devaluation” and NEER depreciation. A significant clustering of changes in the REER around zero confirms that in practice changes in exchange rate competitiveness were not frequently achieved in the programs to ease the adverse impact of adjustment on growth.

¹⁶ Almost half of GRA crisis programs and only 13 percent of GRA programs other than crisis programs had REER depreciation above 4 percent.

**Figure 7. Cross-Country Distribution of Cumulative REER Changes During Programs
(Positive figures for appreciation)**



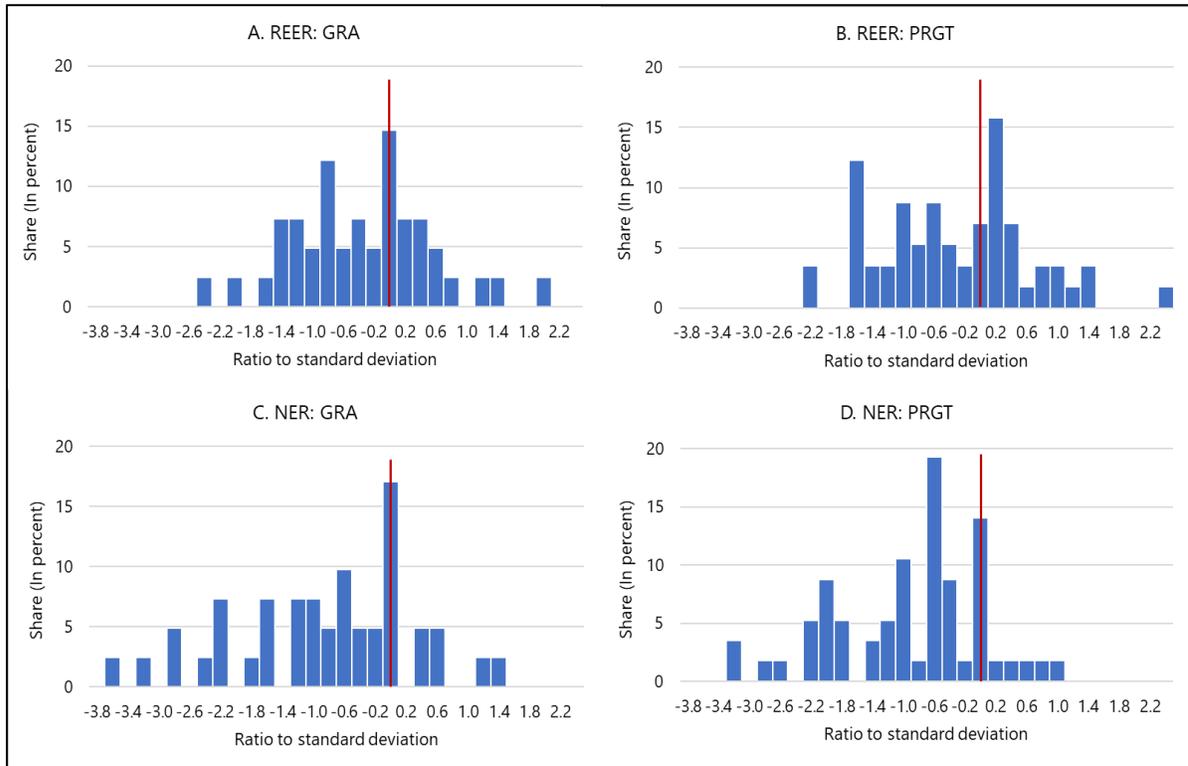
Source: Authors' calculations.

Note: The cumulative REER change over the program period based on monthly data, up to 36 months after approval. Positive (negative) values on the horizontal axis represent appreciation (depreciation). Based on completed programs (approved and completed between September 2008 and March 2020).

46. To put the magnitude of REER and NER changes during programs into historical perspective, annual changes in the REER are measured relative to the country-specific standard deviation calculated over 2000–19.¹⁷ Focusing on the first year of the program during which exchange rate corrections are most likely, about one-fifth of GRA programs and a quarter of PRGT programs achieved a REER depreciation exceeding one standard deviation during the first program year (Figure 8, Panels A and B). As to changes in the NER, one-third of GRA programs and two-fifths of PRGT programs achieved nominal depreciation above one standard deviation (Figure 8, Panels C and D).

¹⁷ This measure is expected to better capture some country-specific factors, including trade openness, exposure to shocks, and the track record of macroeconomic stability.

Figure 8. Cross-Country Distribution of Changes in REER and NER: First Year of the Program (Positive figures for appreciation)

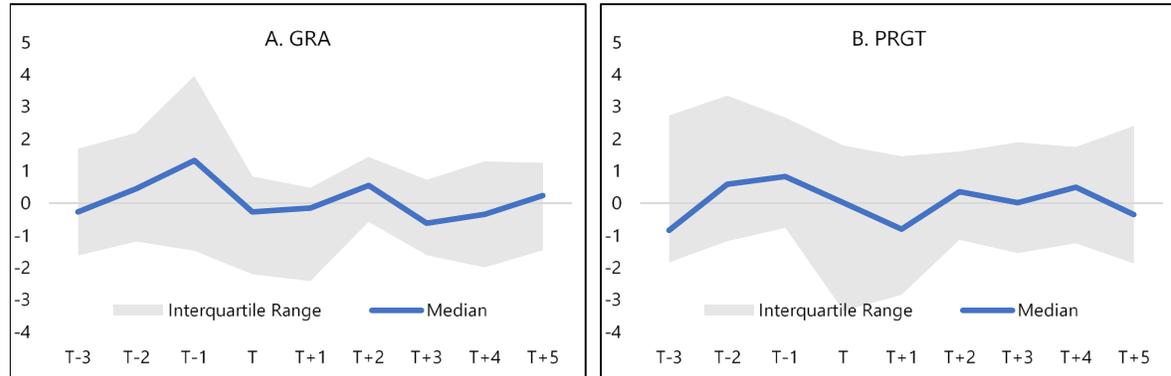


Source: Authors' calculations.

Note: Based on annual data for the programs in the evaluation sample, approved and completed between September 2008 and March 2020. Standard deviations are country country-specific and calculated by using the annual data over 2000–19 for each country.

47. Notwithstanding that movements in the REER were typically quite muted during the program period, the exchange rate tool appears to have been used to correct REER overvaluation prior to program approval. When assessed by percentage deviations from the trend REER, GRA programs had on average larger overvaluation immediately prior to program approval than PRGT programs (Figure 9). REER overvaluation exceeded 4 percent at T-1 for a quarter of GRA programs and in less than one-fifth of PRGT programs. Cross-country evidence suggests that initial REER overvaluation was corrected rather quickly and even reversed by the first year of the program (Figure 10). For the full sample, a 1 percent overvaluation at T-1 was corrected almost fully by the first year of the program (T) as indicated by the black trendline. In cases where initial overvaluation exceeded 4 percent, REER correction was on average twice larger than initial overvaluation as indicated by the red trend line, resulting in substantial REER undervaluation in the first year of the program in cases where the initial overvaluation exceeded 7 percent.

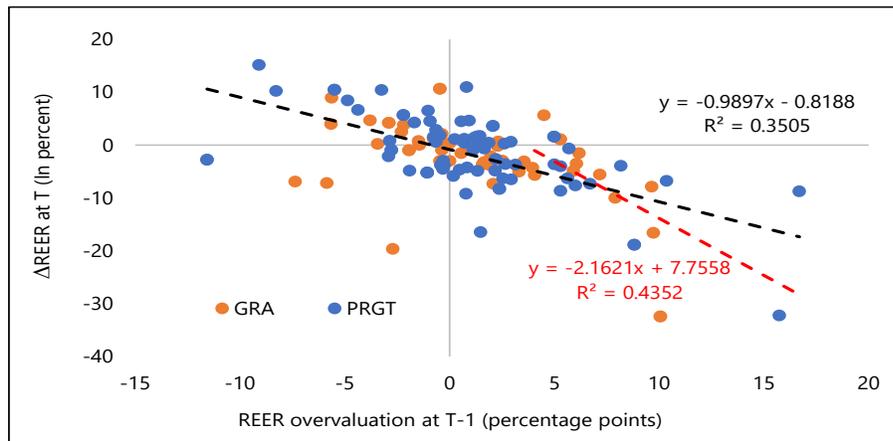
**Figure 9. Percentage Deviation from Trend REER
(Positive figures for appreciation)**



Source: Authors' calculations.

Note: The trend REER is estimated by applying the HP filter to annual REER data over 2000–19 for each country. T refers to the first year of the program. Data cover the programs in the evaluation sample, approved and completed between September 2008 and March 2020.

**Figure 10. REER Reaction to Pre-Program Overvaluation
(Positive figures for appreciation or overvaluation)**



Source: Authors' calculations.

Note: REER overvaluation is measured by the percentage deviation of the actual REER from the trend. The trend line in red is for REER overvaluations exceeding 4 percentage points only. Data cover the programs in the evaluation sample, approved and completed between September 2008 and March 2020.

48. Selected examples point to continued REER appreciation during programs despite the staff's ex-ante assessment of overvaluation.¹⁸ Prior to Honduras' 2014 program, staff assessed the exchange rate as overvalued by 7–10 percent but the REER appreciated by 2 percent during the program despite a significant NER depreciation. In the case of Pakistan (2013), while staff

¹⁸ The staff's ex-ante exchange rate assessments are taken from the IMF country reports at program approval or the latest Article IV consultation report prior to program approval.

estimated that the rupee was modestly overvalued at 3–6 percent prior to the program, the REER appreciated by a further 10 percent during the program even with some NER depreciation. In Ghana’s 2015 program, staff estimated an overvaluation of 7–14 percent. The REER appreciated by about 11 percent during the program despite a sharp NER depreciation.

Exchange market pressures

49. In practice, an excess demand for foreign exchange can be accommodated by a variety of policy responses, ranging from allowing a depreciation of the currency, drawing down foreign reserves, raising interest rates or a combination of these measures. Different approaches would yield different outcomes on the nominal exchange rate, implying that developments in the nominal exchange rate alone do not fully capture the underlying pressure in the foreign exchange market.

50. The exchange market pressure index (EMPI) is constructed to provide a more valid assessment of exchange market pressure. In this paper, the EMPI is constructed by using movements in the nominal exchange rate and international reserves only, in view of data constraints.¹⁹ Drawing on Kaminsky and Reinhart, (1999), the EMPI is defined as²⁰:

$$EMP_{it} = \frac{1}{\sigma_{\Delta\%er_{it}}} \Delta\%er_{it} - \frac{1}{\sigma_{\Delta res_{it}}} \Delta res_{it}$$

where $\Delta\%er_{it}$ is the month-on-month percentage change of the nominal bilateral exchange rate of country i in month t , Δres_{it} is month-on-month change in net foreign assets (NFA) scaled by the lagged value of the monetary base (MB), and $\sigma_{\Delta\%er_{it}}$ and $\sigma_{\Delta res_{it}}$ are the standard deviations of each component over January 2008–September, 2020 calculated separately for PRGT and GRA countries. The index increases with a depreciation of the domestic currency and with a loss of international reserves. Hence, an increase reflects stronger selling pressure on the domestic currency.

51. According to the EMPI, at least a quarter of GRA programs experienced strong selling pressures on the domestic currency during the few months prior to programs, which were particularly high in case of crisis programs (Figure 11). By the first month after program approval, however, the selling pressure eased sharply, likely reflecting the combined effect of an

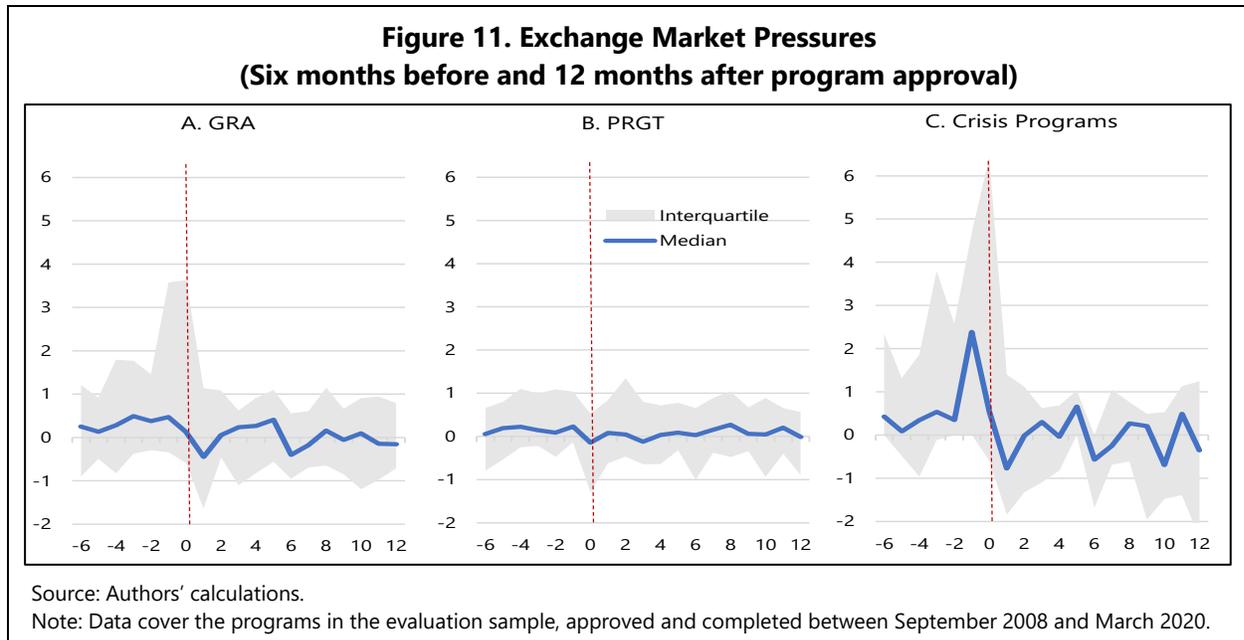
¹⁹ Eichengreen and others (1995) also include the level of domestic interest rates in their index of exchange market pressure. Following Kaminsky and others (1999), it is excluded from the EMPI owing to data limitations on market-determined interest rates in developing countries.

²⁰ The index in this form is used in Carderelli, Elekdag, and Kose (2009). Specifically, the components are derived as follows:

$$\Delta\%er_{it} = \frac{er_{it} - er_{it-1}}{er_{it-1}} \quad \Delta res_{it} = \frac{NFA_{it} - NFA_{it-1}}{MB_{it-1}}$$

where er_{it} is the monthly nominal bilateral exchange rate of country i in month t against the US\$ where an increase corresponds to a depreciation. For fixed exchange rate regimes, the monthly nominal bilateral exchange rate against the reference currency is used. NFA and MB refer to the net foreign assets and the monetary base, respectively, taken from the IMF’s IFS database.

announcement of an adjustment program and financing from the Fund as well as other multilateral and bilateral financing catalyzed by a program. Exchange market pressures were more subdued for most PRGT programs.



52. Following the convention in Kaminsky and others (1998), we identify episodes in which the EMPI index is above its mean by more than three standard deviations as currency crises.²¹ Among GRA programs during the evaluation period, this exercise identifies Iceland (2008), Seychelles (2008), Hungary (2008), Armenia (2009), Belarus (2009), Serbia (2009), Egypt (2016), and Ukraine (2008 and 2014) as having currency crises prior to program approval. All but the Egypt program had exceptional access. Among PRGT countries, Malawi (2012) and Mozambique (2015) were identified as programs with currency crises.

53. In Egypt (2016), a large devaluation prior to the program's approval corrected accumulated overvaluation. Both programs with Ukraine were also preceded by significant efforts to correct overvaluation but quickly went off track. In a number of GRA crises programs, developments in the NER, NEER, and REER reveal that they involved a large depreciation prior to programs, only in one case combined with heavy interventions and reserve losses (Iceland, 2008). In several cases, a relatively modest nominal exchange rate appreciation took place a few months into the program, suggesting an initial overshooting of the exchange rate. Nevertheless, large NER and NEER corrections lasted through the end of the programs, suggesting that significant overvaluation prior to the program was an important trigger of the crises. The resulting significant REER depreciation was sustained in most cases, although partially eroded in some cases owing to inflation above trading partners (Egypt, 2016; and Ukraine, 2008).

²¹ The calculated thresholds are 7.5 and 7.9 for GRA and PRGT programs, respectively.

54. Turning to PRGT programs, in Malawi (2012), a severe currency crisis took place prior to the program, accompanied by a sharp exchange rate depreciation that addressed significant overvaluation. The nominal exchange rate continued to depreciate significantly until 2016 owing to high inflation. Mozambique (2013) had a relatively mild crisis during its program under the non-financial Policy Support Instrument in December 2015 in the face of lower commodity prices and declining foreign direct investment (FDI) and foreign aid, which led to an approval of a Standby Credit Facility with front-loaded access to augment reserves.

VI. REER, EXTERNAL ADJUSTMENT, AND GROWTH

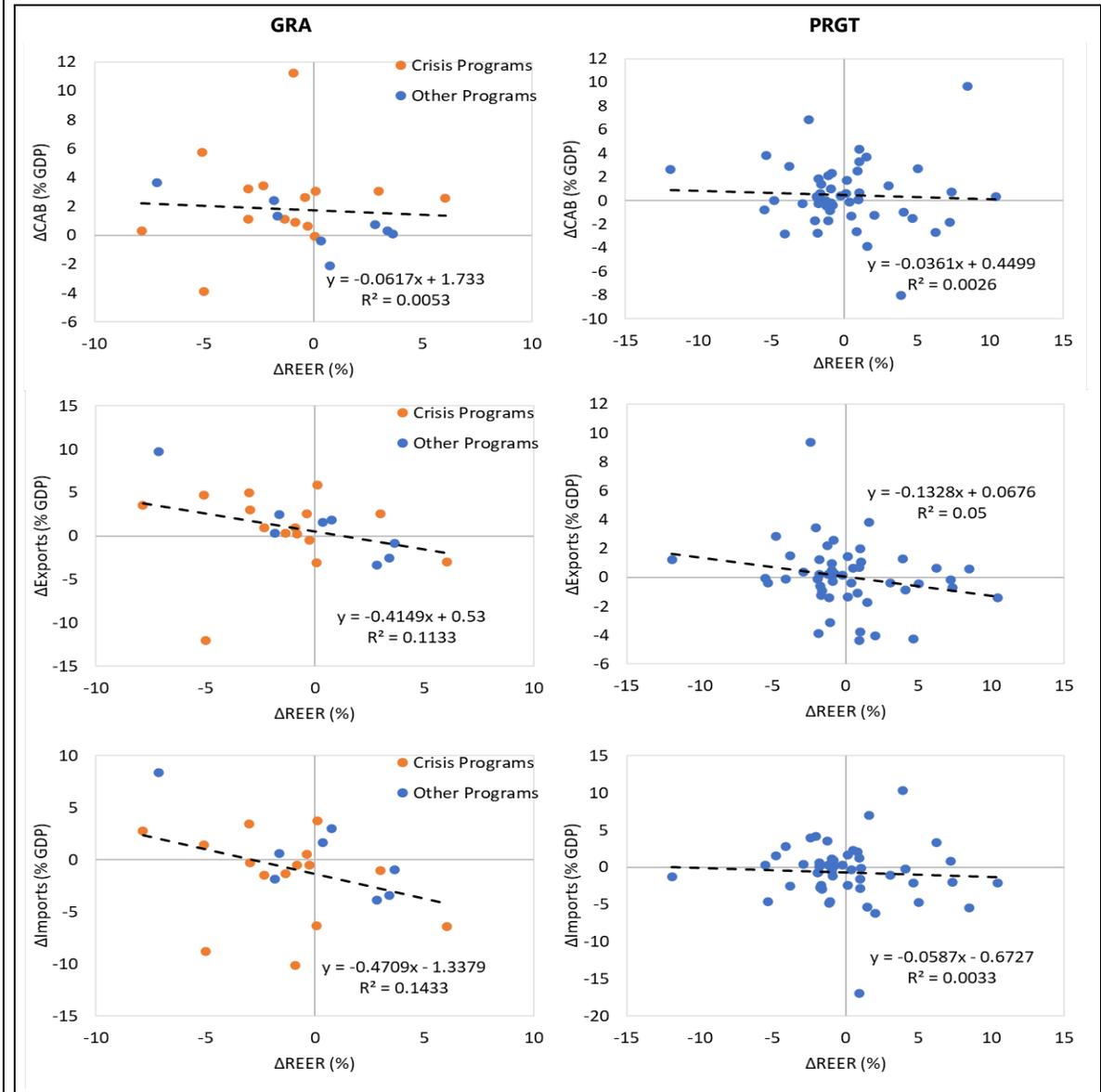
55. This section examines the role of REER depreciation in promoting adjustment and growth in the program context, based largely on bivariate analysis. It should be recognized up front that the bivariate relationship between REER and adjustment and growth masks the influence of a host of other factors and thus may not capture appropriately the marginal impact of REER depreciation on growth. Nevertheless, multivariate results from Kim and others (2021) also suggest a positive link between depreciation and growth, especially in PRGT programs.

External adjustment outcomes

56. Looking first at adjustment in GRA programs, REER depreciation seems to have on average supported CA adjustment although only weakly (Figure 12, left panels). In GRA programs, REER depreciation appears to have on average helped promote not only exports but also imports, resulting in limited contribution of REER depreciation to CA adjustment. The bivariate relationships between REER depreciation and CA adjustment or adjustments in exports and imports in PRGT programs are broadly similar to those in GRA programs with limited contribution to CA adjustment, although the marginal impact of REER depreciation seems to have on average been stronger on exports than on imports (Figure 12, right panels).

57. While the bivariate results suggest only a weak impact of REER depreciation on CA adjustment, a multivariate analysis, which controls for other factors that affect the CA balance, paints a different picture, particularly for GRA countries (Annex I). The regression analysis, which takes account of adjustment policies, shows that for program countries (excluding small states) over the evaluation period, the effect of the change in the REER on CA adjustment is highly significant with the expected sign for GRA countries, although not significant for PRGT countries (Table AI.1). Specifically, a REER depreciation of 10 percent is estimated to increase the CA balance on average by 1.0-2.6 percent of GDP depending on the level of trade openness (with the effect being larger for higher trade openness). A partial counterfactual analysis based on these estimates indicates that for GRA countries, CA adjustment of 1 percent of GDP would require REER depreciation in the order of 4-10 percent depending on the level of trade openness. Alternatively, the same CA adjustment of 1 percent of GDP would require a significant negative output gap of 1.8 percent of GDP for GRA countries. For PRGT countries, FDI is found to be an important determinant of the CA balance reflecting the high import content of FDI flowing to LICs.

Figure 12. External Adjustment vs. Change in REER



Source: Authors' calculations.

Note: Based on completed programs in the evaluation sample, approved and completed between September 2008 and March 2020.

58. These findings in a multivariate setting underline that country characteristics such as trade openness matter for the effectiveness of REER depreciation in improving the CA balance. However, they do not necessarily imply that the exchange rate policy may be less effective in supporting external adjustment in PRGT countries or small states. Rather, they underscore the importance of a more granular and tailored approach to the use of the exchange rate tool for external adjustment in these countries, taking into account country characteristics such as trade openness, the ERPT, dependence on remittances, and the composition of exports.

Growth outcomes

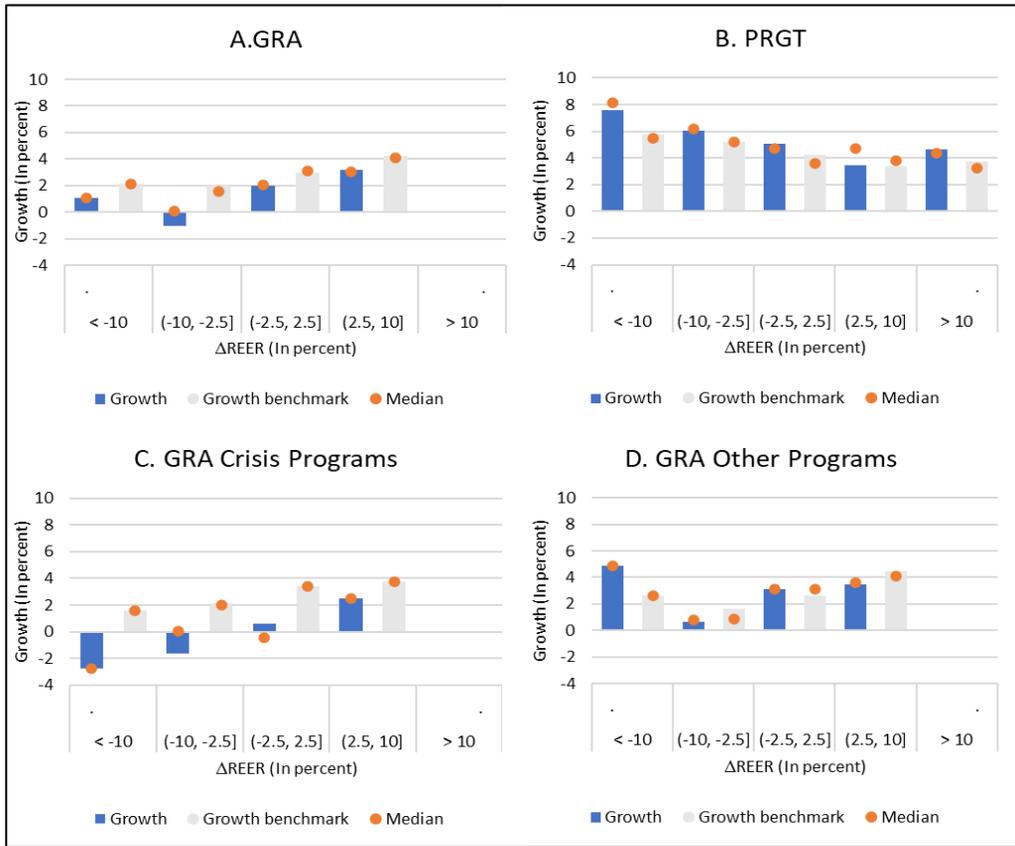
59. Growth outcomes seem to have benefitted from REER depreciation in PRGT programs, but the evidence is less clear for GRA programs. The growth outcomes are assessed against the growth benchmarks estimated in the background paper by Kim and others (2021) to capture the variation in actual growth explained by external factors as well as country-specific historical trend growth. The bivariate relationship between REER changes and growth is generally weak in GRA programs where more REER depreciation is associated with lower, and not higher, growth (Figure 13A). In contrast, larger REER depreciation is on average associated with higher growth in PRGT programs (Figure 13B). The counter-intuitive result from GRA programs reflects that the largest changes in REER occurred in crisis programs, which typically experienced less favorable growth outcomes relative to benchmark in view of large adjustment needs in these programs (Figure 13C). When crisis programs are excluded, other GRA programs that experienced depreciations above 10 percent had sharply better growth outcomes relative to benchmark while growth in GRA programs with appreciations above 2.5 percent fell substantially below benchmark (Figure 13D).

60. Not surprisingly, GRA programs that experienced high exchange market pressure identified using the EMPI prior to program approval had weaker growth outcomes.²² Specifically, GRA programs preceded by episodes of high exchange market pressure had significantly worse growth outcomes during the first year of the program, likely reflecting significantly front-loaded external adjustment (Figure 14). Both the median growth and the deviation from the growth benchmark were sharply negative for the high EMPI GRA programs, while the median growth was modest but positive for normal programs. In contrast, for PRGT countries, there was little difference in the median growth outcomes between high EMPI and normal episodes.

61. Kim and others (2021) explored the growth impact of real exchange rate changes in more formal multivariate regression analysis, which takes account of adjustment policies, and found more rigorous evidence of REER depreciations contributing growth benefits, particularly in the PRGT context. Specifically, the regression analysis found that where it has occurred, real effective depreciation ($\Delta REER < 0$) has helped to boost growth, especially in PRGT programs where a 10 percent real depreciation is estimated to boost growth by 1.1–1.7 percentage points. For GRA programs, the same 10 percent real depreciation is estimated to boost growth by 0.4–2.9 percentage points although the impact is generally not statistically significant.

²² The episodes of high exchange market pressure prior to program approval are identified based on a threshold of one standard deviation above the mean of the monthly EMPI distribution prior to programs (up to 5 months prior to and including the approval month, implying thresholds of 6.1 and 3.1, respectively for GRA and PRGT programs). This yields 12 GRA programs and 15 PRGT programs.

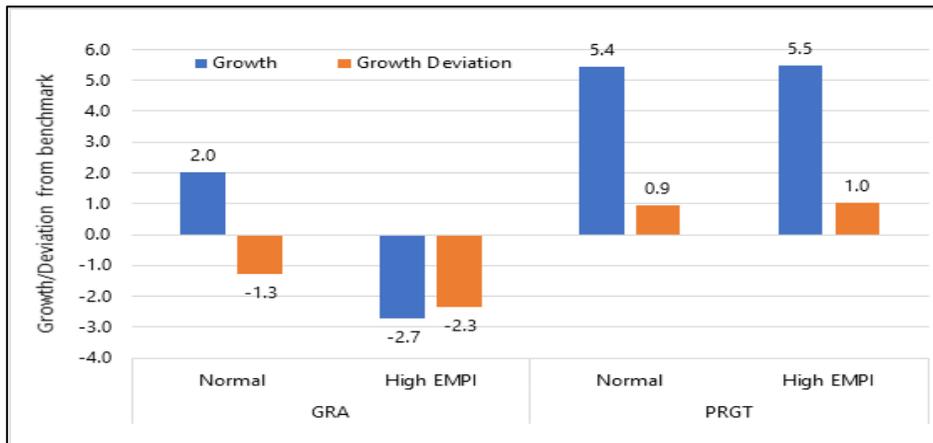
Figure 13. Growth Outcomes by Change in the REER: Completed Programs



Source: Authors' calculations.

Note: Growth benchmarks estimated by Kim and others (2021). Based on completed programs in the evaluation sample, approved and completed between September 2008 and March 2020.

Figure 14. EMPI vs. Growth and Deviation from Benchmark Growth (First year of the program)



Source: Authors' calculations.

Note: Data show median outcomes based on completed programs in the evaluation sample, approved and completed between September 2008 and March 2020.

VII. CONCLUSIONS

62. This paper examines how exchange rate policy has been used as a tool to support external adjustment and growth in IMF-supported programs over the period 2008–19.

Exchange rate regime transitions

63. As found in earlier Reviews of Conditionality, transitions in the ERR during programs in the evaluation period were relatively rare. Those that occurred were mostly between intermediate and flexible regimes and more often towards greater fixity rather than greater flexibility and not more durable compared to transitions outside of programs. The infrequency of regime transition is not unique to program periods. Transition probabilities were similar between program and non-program periods and exhibit a strong tendency for status quo. Regime transition towards greater flexibility was more likely in GRA programs than in PRGT programs, while the opposite was the case for transition towards greater fixity. Almost half of regime transitions during a program had at least one subsequent reversal within three years.

Exchange rate developments

64. Programs during the evaluation period typically involved a significant nominal depreciation against the U.S. dollar, with greater cross-country variation in GRA programs than in PRGT programs. For a quarter of GRA programs, many of which were exceptional access and crisis programs, NER depreciation prior to program approval was quite sharp. The analysis of exchange market pressure showed that at least a quarter of GRA programs experienced strong selling pressure on the domestic currency prior to programs, which was particularly high in crisis programs. After program approval, the selling pressure eased sharply. Exchange market pressure was subdued for most PRGT programs.

65. Movements in NEER and REER were much more muted although again there was substantial cross-country variation, particularly in GRA programs. Efforts were made to address overvaluation in cases where significant, but other than in these cases improvements in price competitiveness through REER depreciation were quite infrequent. A significant clustering of changes in the REER around zero during programs suggests that in practice changes in exchange rate competitiveness were the exception not the rule. Depreciation of the REER in excess of 4 percent were achieved in 28 percent of GRA programs, mostly crisis programs, and in 25 percent of PRGT programs. Moreover, a number of PRGT programs relying on heavily managed exchange regimes as an inflation anchor experienced quite significant real exchange rate appreciations with adverse implications for growth. Notably, REER movements towards depreciation were particularly limited for members of currency unions, where a significant depreciation was achieved only in a few cases through a combination of “internal devaluation” and some NEER depreciation.

REER, external adjustment, and growth

66. REER depreciation, where achieved, seems to have on average supported CA adjustment particularly in GRA programs. Evidence for growth benefits from REER depreciation is stronger for PRGT than GRA programs. The bivariate relationship between REER changes and growth is generally quite weak in crisis GRA programs where more REER depreciation is associated with lower, and not higher, growth, reflecting in part that the largest changes in REER occurred in crisis programs, which typically experienced less favorable growth outcomes in view of the large adjustment needs. In contrast, larger REER depreciation is on average associated with higher growth in PRGT and GRA programs other than crisis programs. Similarly, GRA programs preceded by episodes of high exchange market pressure had significantly worse growth outcomes during the first year of the program, while no such evidence is found for PRGT programs.

Lessons

67. The evidence and analysis in this paper suggests that the exchange rate tool could be used more actively as a means to support growth outcomes while achieving external adjustment, although the ground for more active use of the exchange rate would need to be well prepared. This is particularly relevant for PRGT and GRA programs other than crisis programs, where the cases that did achieve sizeable REER depreciations saw significant growth benefits, including from stronger export performance. At the same time, however, policies to contain the inflationary impact of depreciation, in particular a monetary policy framework that anchors inflation expectations, are required to ensure the effectiveness of the exchange rate as a policy tool, especially in PRGT programs.

68. Where exchange rate adjustments have worked well, they have followed various paths depending on country circumstances—e.g., regime transition towards greater flexibility; more aggressive use of flexibility available under intermediate regime; and internal devaluation under a currency peg. The most effective route will be an upfront currency adjustment, although care will be needed to limit ERPT and ensure that any depreciation is consistent with members' obligations under Article IV to avoid manipulating exchange rates in order to prevent effective BOP adjustment or to gain an unfair competitive advantage.

69. Finally, use of the exchange rate as a policy tool would need to take due account of country circumstances and the concerns giving rise to "fear of floating" while respecting the member's right to choose their exchange rate regime. To address obstacles to greater use of the exchange rate tool, there needs to be early attention to: (i) technical issues and related TA support to build functioning foreign exchange markets with adequate depth and liquidity; (ii) the need to ensure adequate inflation anchors (e.g., build a credible inflation targeting monetary policy regime); and (iii) general fear of floating—concerns about inflation stability, currency mismatches and balance sheet effects, debt dynamics, distributional consequences of exchange rate depreciation, and political resistance.

ANNEX I. CURRENT ACCOUNT ADJUSTMENT: REGRESSION ANALYSIS

This annex presents the estimation results for the impact of REER depreciation on current account (CA) adjustment for a panel sample of program countries included in the evaluation period over 2007–19 and a sensitivity analysis. The estimation is undertaken by using the system Generalized Method of Moments (GMM) estimator to allow for persistence in the CA in percent of GDP (CABY) and to account for the endogeneity of the control variables included in the regressions which are instrumented by their lagged values.¹

The general dynamic panel model for CABY, y_{it} , takes the following form:

$$y_{it} = \alpha y_{it-1} + z'_{it}\theta + x'_{it}\beta + \gamma_i + \tau d_t + \varepsilon_{it}$$

where γ_i is a country fixed effect, z'_{it} and x'_{it} respectively represent the endogenous or predetermined regressors and exogenous regressors, and τd_t are time fixed effects for each year included in the sample period. Two variables, the change in the REER and output gap are included in z'_{it} . The output gap (defined as the percentage deviation of actual GDP from potential GDP) is constructed by applying the HP-filter to real GDP data for each country over the post-2000 period. Given the endogeneity of the change in the REER and output gap with respect to CABY, they are instrumented by their own lags in addition to other exogenous instruments. Exogenous variables, x'_{it} , include the change in the terms of trade (ToT), trading partners' growth, and foreign direct investment (FDI) as a share of GDP. The first two regressors are also used as exogenous instruments. Changes in the REER and the ToT are both weighted by lagged trade openness, defined as nominal exports plus imports of goods and services in percent of GDP. Real GDP growth in trading partners is weighted by the lagged share of exports of goods and services in GDP.

Regression results

Table A1.1 displays the estimation results for various specifications. The benchmark specification shown in column (1) is chosen following a general-to-specific modeling approach based on the specification tests. The benchmark specification passed all specification tests, confirming the validity of instruments and the assumed lag structure.²

¹ See Arellano and Bover (1995) and Blundell and Bond (1998) for technical details of the system GMM estimator. The estimation is undertaken by using the Stata user-written command `xtabond2` (Roodman, 2009).

² For each regression, the standard specification tests for the system GMM estimator were reported: the Sargan (1958) and Hansen (1982) tests for overidentifying restrictions (i.e., tests for the validity of the instruments) and the test for serial correlation in errors. While not reported here, the benchmark specification also passed the difference-in-Hansen tests, which confirmed the validity of the subgroups of instruments. The general specification presented in column 2 did not pass the specification tests, therefore, the estimation results were not reliable. Although it passed the Hansen test, a very high p-value indicated the problem of too many instruments. While column 4 found a significant effect from trade openness and passed the Sargan and Hansen specification tests it failed the difference-in-Hansen tests for subgroups. Columns 7 to 10 for the full sample failed specification tests.

Key findings are summarized as follows:

- **Persistence.** The estimated coefficient of the lagged dependent variable is positive and highly significant across all specifications, suggesting moderate persistence in the CA balance.
- **REER.** REER depreciation (interacted with lagged trade openness) is found to have significantly increased CABY for GRA countries in the restricted sample excluding small states (column (1)-(6)). In PRGT countries, the coefficient has the same sign but is not significant. The significance of the change in the REER disappears in the full sample for GRA countries (columns (7)-(10)).
- **External conditions, output gap, and FDI.** Two contemporaneous covariates capturing the impact of external conditions—the terms of trade (ToT) weighted by lagged trade openness and trading partners' growth weighted by the lagged share of exports of goods and services in GDP—are highly significant determinants of the CA balance with expected signs in most specifications. The output gap is significant in most specifications for GRA countries but not for PRGT countries. Finally, an increase in FDI is found to have led to a significant deterioration in the CA balance only for PRGT countries, reflecting the high import content of FDI.³
- **Country characteristics.** The regression results highlight that country characteristics have mattered significantly for determining the impact of the REER changes on CA adjustment. In particular, trade openness is an important factor amplifying transmission of the exchange rate effect.

Overall, the results underscore the importance of a more granular approach to the use of the exchange rate policy tailored to country circumstances.

The result that the REER change is significant in GRA countries but not in PRGT countries or small states does not necessarily indicate that the exchange rate policy is not an effective tool for external adjustment in those countries. Rather, the parsimonious specification may not be enough to capture other important factors that increase CABY volatility in these countries, such as remittances, less role for manufactured exports (e.g., dominance of tourism in small states and commodities in LICs), and frequent supply shocks including natural disasters and conflicts.

Sensitivity analysis

To illustrate the REER impact on CABY, Table A1.2 presents a sensitivity analysis by the level of trade openness for GRA countries, derived from the benchmark specification. A REER depreciation of 1 percent leads to an average CABY increase in the range of 0.10–0.26 percent of GDP in the short-term depending on the trade openness (column (1)). The corresponding range for the long-

³ Although not reported, the impact of FDI on the CA balance is negative but not significant in GRA countries.

term effect is 0.17–0.48 percent of GDP (column (2)). The last two columns present a partial counterfactual analysis of how much adjustment in the exchange rate or output gap alone would be required to improve CABY by 1 percent of GDP. The required REER depreciation would decline with trade openness, from more than 10 percent for the 10th percentile of trade openness to slightly less than 4 percent for the 90th percentile of trade openness (column (3)). The required negative output gap for the equivalent improvement in CABY would be 1.8 percent of potential GDP (column 4).

Table AI.1. Results of Current Account Balance to GDP Regressions

	Excluding Small States						Full Sample			
	(1) CABY Benchmark	(2) CABY	(3) CABY	(4) CABY	(5) CABY	(6) CABY	(7) CABY	(8) CABY	(9) CABY	(10) CABY
CABY (t-1)	0.449*** (0.104)	0.385*** (0.079)	0.434*** (0.114)	0.542*** (0.083)	0.476*** (0.113)	0.382*** (0.088)	0.531*** (0.148)	0.538*** (0.192)	0.501*** (0.131)	0.469*** (0.136)
$\Delta \ln(\text{REER}) * \text{Openness}(t-1)$ GRA	-0.184*** (0.055)	-0.129*** (0.046)	-0.187*** (0.057)	-0.138** (0.065)	-0.195*** (0.060)		-0.093 (0.061)		-0.077 (0.071)	
$\Delta \ln(\text{REER}) * \text{Openness}(t-1)$ PRGT		-0.057 (0.070)							0.059 (0.089)	0.081 (0.090)
Output gap GRA	-0.548*** (0.172)	-0.571*** (0.210)	-0.515*** (0.160)	-0.570*** (0.170)			-0.493*** (0.145)	-0.175 (0.325)	-0.407*** (0.126)	
Output gap PRGT		-0.116 (0.283)								0.119 (0.307)
$\Delta \ln(\text{ToT}) * \text{Openness}(t-1)$	0.175** (0.077)	0.162*** (0.048)	0.193** (0.074)	0.211*** (0.063)	0.177** (0.071)	0.172*** (0.061)	0.139* (0.078)	0.148** (0.061)	0.147** (0.072)	0.137** (0.062)
FDIY PRGT	-0.519*** (0.170)	-0.754*** (0.217)	-0.553** (0.210)	-0.611*** (0.120)	-0.455*** (0.144)	-0.836*** (0.208)	-0.624*** (0.096)	-0.547*** (0.133)	-0.530*** (0.147)	-0.558*** (0.182)
TP growth*exports to GDP(t-1)	0.950** (0.394)	1.185* (0.679)	1.099* (0.561)	0.469 (0.443)	0.752** (0.368)	1.435* (0.746)	0.633*** (0.222)	0.479** (0.234)	0.521** (0.222)	0.481** (0.234)
Openness(t-1) GRA		-0.010 (0.019)	-0.005 (0.009)							
Openness(t-1) PRGT		0.015 (0.025)								
Openness(t-1)				0.017* (0.009)						
Output gap					-0.450* (0.258)	-0.407 (0.335)				
$\Delta \ln(\text{REER}) * \text{Openness}(t-1)$						-0.091 (0.064)		0.002 (0.062)		
Constant	-2.031 (2.605)	-3.109* (1.794)	-2.029 (2.315)	-2.914 (2.644)	-0.021 (3.564)	-4.360 (2.968)	-1.730 (2.377)	-2.317 (2.398)	-1.444 (1.675)	-1.800 (2.723)
No of Observations	773	773	773	762	773	773	892	892	892	892
Number of countries	60	60	60	59	60	60	71	71	71	71
Time effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of instruments	46	74	48	50	46	46	47	47	72	46
Sargan p	0.467	0.0155	0.511	0.461	0.453	0.004	0.011	0.000	0.000	0.000
Hansen p	0.258	0.976	0.451	0.188	0.325	0.0811	0.729	0.288	0.558	0.215
AR2 p	0.260	0.330	0.329	0.257	0.213	0.216	0.540	0.546	0.528	0.461

Source: Authors' estimates.

Note: Estimated by the system generalized methods-of-moments (GMM) estimator. The dependent variable is current account balance to GDP (in percent). The p-values for Sargan and Hansen tests for overidentifying restrictions are presented to test for the validity of the instruments. The p-values for the second order autocorrelation in first-differenced errors are also presented. Significant at 10 percent:*; 5 percent:**; and 1 percent:***, robust standard errors are in parentheses.

**Table AI.2. Impact of REER Depreciation on Current Account Balance
(GRA countries)**

Openness	Percentile	REER depreciation= 1% at $t=0$		Δ CABY= 1% of GDP at $t=0$	
		Impact on CAB (% of GDP)		REER (%)	Output gap (%)
		Short-term	Long-term	Short-term	Short-term
52	10th	0.10	0.17	-10.4	-1.8
68	25th	0.13	0.23	-8.0	-1.8
86	50th	0.16	0.29	-6.3	-1.8
110	75th	0.20	0.37	-5.0	-1.8
143	90th	0.26	0.48	-3.8	-1.8

Source: Authors' estimates.

Note: Derived for the coefficients in the benchmark specification. For REER, an increase (decrease) shows appreciation (depreciation). A positive (negative) output gap indicates output above (below) potential. The last two columns show the required adjustment in the REER or output gap alone to improve CABY by 1 percentage of GDP in the current year ($t=0$). The percentiles for trade openness are based on the estimation sample for GRA countries.

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