

THE REAL EXCHANGE RATE AS A TARGET OF MACROECONOMIC POLICY

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Abstract

In recent years, several authors have argued that developing countries should aim to target a stable and competitive real exchange rate (SCRER) to foster economic growth. A growing body of empirical research gives support to this claim. Although more theoretical work is needed, some ideas from development theory can help to explain the empirical findings. For instance, if modern tradable activities display some form of increasing returns to scale, market forces alone would deliver a set of relative prices to render capital accumulation in these activities suboptimal. This chapter supports the view that developing countries could target SCRER as part of a development strategy that promotes the expansion of modern tradable activities. We review the empirical findings, discuss the channels through which a SCRER can stimulate economic growth and describe the policies needed to pursue a strategy based on a SCRER.

Introduction

In recent years, the idea that a stable and competitive real exchange rate (SCRER) can foster economic growth in developing countries has gained much attention, with a growing body of research having provided persuasive evidence indicating that undervaluation of the currency – a high real exchange rate (RER) level – is positively associated with higher economic growth. Moreover, research has also documented that RER volatility negatively affects growth. Based on this and other more episodic evidence, some economists and analysts have started to advocate that developing countries should target a SCRER as part of their development strategy.

The aim of this chapter is to take stock of the work – including ours – that has addressed different

aspects of the SCRER strategy for development, focusing on what we consider the three main issues. First, we review in section I the empirical literature finding evidence that SCRER is positively associated with economic growth. Second, we discuss the mechanisms that could explain such an association and their supporting evidence or lack of it. In section II, we explore the theoretical and practical aspects of macroeconomic management in a framework that targets a SCRER while attaining full employment, low inflation and balance of payments sustainability. We conclude the chapter in section III with some final remarks.

Before moving on, some definitions are in order. We define the exchange rate as the domestic price of

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a foreign currency. Consequently, a rise (fall) in the nominal/real exchange rate implies a nominal/real depreciation (appreciation) of the domestic currency. The RER is the relative price between tradables and non-tradables. A competitive RER level is one that is above its equilibrium level.¹ We generally refer

to a competitive RER level as the level at which the modern tradable sector of a developing economy reaches a risk-adjusted profit rate equal to that of the same sector in a developed economy.² We use competitive or high RER and undervalued domestic currency indistinctively throughout this chapter.

I. SCRER and economic performance³

The relationship between the RER, real wages and output usually generates some confusion. On the one hand, it is commonly accepted that real currency depreciation has a negative impact on output level in the short run. A standard Keynesian/Structuralist interpretation is that real depreciation redistributes income against wage earners, who have a large propensity to spend, and thus it contracts aggregate demand and output levels. Another common mechanism is the negative balance sheet effect of devaluation when debts are issued in foreign currency. On the other hand, the proposition that we develop in this chapter claims that a stable and competitive level of the RER – through mechanisms discussed below – has a positive effect on the rate of growth of output and real wages in the medium run.⁴

The two propositions are not contradictory: the former refers to the *short-run* effects of a *change* in the RER on output *level*, and the latter to the *medium-run* effects of the *level* (and stability) of the RER on the *rate of change* of output (i.e., economic growth). While there is a good deal of evidence supporting the first proposition,⁵ the second one is more controversial. Below, we review a recent body of research that supports the second proposition and the mechanisms involved.

A. Empirical evidence

Most empirical work analysing the association between RER levels and economic growth has been conducted through growth regressions, finding substantial evidence that competitive and stable RER levels tend to be associated with higher GDP per capita growth rates. The association appears robust to changes in the estimation technique – cross-section OLS, panel data (fixed and random effects), dynamic

panel data (GMM), non-linear panels and panel cointegration techniques –, the number of control variables and the data sources for both the dependent and independent variables.

An interesting result is that the RER-growth association seems to be especially strong in developing countries. Rodrik (2008) tests whether there is any significant difference between developed and developing countries. He uses a fixed-effects model for a panel of up to 184 countries between 1950 and 2004 and defines developing countries as those with a GDP per capita less than \$6,000 in constant dollars of 2005. He finds that the positive relationship between RER competitiveness and economic growth is stronger and more significant for developing than developed countries. Rapetti et al. (2012) replicate Rodrik's work and show that if the threshold is selected from anywhere in the \$9,000–\$15,000 range, the estimated effect of RER competitiveness on developed countries' growth is similar to that estimated for developing countries. Given the fragility of Rodrik's result, they investigate the issue in more detail by developing a series of alternative developed/developing countries splits and conducting different empirical strategies, finding that the effect of currency undervaluation on growth is indeed larger and more robust for developing economies. Extending the analysis for a substantially longer period, Di Nino et al. (2011) also find supporting evidence that the relationship is strong for developing countries and weak for advanced countries in both the pre- and post-World War II period (1861–1939 vs. 1950–2009). Other studies, like Cottani et al. (1990), Dollar (1992) and Gala (2008), focus exclusively on developing countries and find similar evidence of the positive effect of RER competitiveness on growth.

Since most of studies have used RER misalignment indexes as measures of RER levels, a valid

concern is whether the results are driven by cases of RER overvaluation decelerating economic growth. Put differently, the positive relationship between RER levels and growth rates may result from low RER levels decelerating growth, which also implies a positive association between RER levels and growth rates. Nonetheless, several studies have explicitly addressed this concern.

Razin and Collins (1999) use a pooled sample of 93 developed and developing countries over 16 to 18 year periods since 1975, finding that currency overvaluation hurts and undervaluation favours growth, although the effect of overvaluation appears stronger. Aguirre and Calderón (2005) find that the estimated coefficients of their RER misalignment indexes are larger for cases of overvaluation than those of undervaluation; but here, again, the positive effect of undervaluation on growth is both statistically and economically significant. Rodrik (2008) finds that overvaluation hurts growth and undervaluation favours growth and reports no significant difference in terms of the size of each effect. Rapetti et al. (2012) find similar results to Rodrik's, although the effect of overvaluation is slightly higher in absolute terms than that of undervaluation. Bereau et al. (2012) use panel non-linear techniques – i.e. a Panel Smooth Transition Regression model – to capture whether there are asymmetries between RER undervaluation and overvaluation. They find robust evidence that undervaluation accelerates and overvaluation decelerates growth, with a similar strength.

Other studies have tested whether the RER-growth association is robust to measurement errors in the dependent and independent variable. MacDonald and Vieira (2010) construct seven different indexes of RER misalignment and use them alternatively on the right-hand side of the growth regressions. They find a significant and positive correlation between RER competitiveness and economic growth, which is stronger for developing and emerging countries. Razmi et al. (2012) use the rate of investment growth as the dependent variable, finding a strong positive association with RER levels.

Many empirical studies have used Penn World Tables (PWT) data for the dependent variable (i.e. GDP per capita growth). Johnson et al. (2009) show that GDP estimates vary substantially across different versions of the PWT and that the results of many published studies employing PWT growth rates – especially those using higher frequency – are fragile when changing from

older to newer versions of the PWT. Libman (2014) address this issue by using growth rates from data sources other than the PWT, such as International Financial Statistics, World Development Indicators and Maddison Historical Statistics and finds that the positive RER-growth association holds.

Other studies have used different empirical strategies, like case and episode studies or historical analyses and also found supporting evidence that SCRERs favour economic growth. Hausmann et al. (2005) identify and analyse determinants of 'growth episodes' in the latter half of the twentieth century, finding that adjustments of RER towards more competitive levels tend to precede sustained growth spurts. Frenkel and Rapetti (2012) carry out a historical analysis of exchange rate regimes and economic performance in Latin America and find that countries have tended to grow faster when macroeconomic policies aimed to maintain SCRERs. Regarding the role of RER stability, Cottani et al (1990), Eichengreen (2008) and Rapetti et al. (2012) have found supportive evidence that RER volatility is negatively associated with GDP growth.

B. Mechanisms

Research has established a robust positive association between RER levels and economic growth. Although there might be some room for debate, it seems widely accepted that the causality runs from RER levels to economic growth. Every-day experience shows that governments use a variety of instruments – including exchange rate, monetary, fiscal, incomes and capital management policies – to manage the level and stability of the RER with real objectives. Thus, the relevant question is not about causality but rather the mechanism explaining why undervalued (overvalued) RER levels would favour (hurt) economic growth. Below, we discuss the mechanisms that we consider more plausible.

One such mechanism focuses on the effects of capital movements on the RER and the probability of crisis. An extreme form of this mechanism arises as a result of currency overvaluation caused by massive capital inflows, which eventually leads to currency, financial and debt crises with a long-lasting negative impact on growth. Indeed, a number of developing countries – mostly in Latin America – have experienced this type of boom-and-bust episodes.⁶ Many of these episodes began with the implementation of

macroeconomic programmes that combined fixed or semi-fixed exchange rates, liberalized current and capital accounts and the deregulation of domestic financial markets. In a first phase, the combination of these elements stimulated capital inflows that appreciated the domestic currency in real terms, expanded economic activity and induced current account deficits. In many cases, a consumption boom ensued without a rise in the investment rate. Even when investment increased, the overvaluation of the currency favoured investment in non-tradable activities with little increase in the export capacity required to repay foreign debt.

In a second phase, the excessive external borrowing raised concerns about the sustainability of the fixed exchange rate regimes and triggered speculative attacks against the domestic currencies, whereby the effect of capital outflows was typically contractionary. The domestic banking systems – which had currency mismatch between dollarized liabilities and assets in domestic currency – faced liquidity problems and went bankrupt in many cases, exacerbating the negative impact on economic activity. In cases in which the collapse of the financial system was severe and the foreign (private and public) debt burden was very high, the crises had long-lasting effects on economic growth. Clear examples of these dynamics are the stabilization programmes based on active crawling pegs (the so-called *tablitas*) in Argentina, Chile and Uruguay during the late-1970s, which ended up in severe debt crises that crippled growth during the ‘lost decade’ of the 1980s. Other stabilization programmes leading to crises occurred during the 1990s in Mexico (1994–1995), Brazil (1998–1999), Argentina (2001–2002) and Uruguay (2002). Taylor (1998) suggests that this kind of cyclical dynamics was also observed in the South East Asian crises of 1997–1998, while Bagnai (2012), Cesaratto (2012) and Frenkel (2013) argue similarly concerning the current crisis in the southern European countries.

Historical records are supportive of this mechanism for the case of currency overvaluation and low or negative growth via the effects of crises, with more recent experience in emerging market accounting for the positive association observed between high/competitive RERs and faster growth. Several authors have indicated that undervalued currency help to stabilize long-term growth by limiting external debt accumulation and avoiding contractionary effects of sudden stops (Prasad et al., 2007). Competitive RERs typically generate current account surpluses and facilitate

foreign exchange (FX) reserve accumulation, which in turn operate as an insurance against international financial instability and sudden stops. Recent research supports this view, with Aizenman and Lee (2007) finding evidence suggesting that international reserve accumulation in emerging markets has been carried out as a self-insurance strategy to protect the economy from sudden stops. Polterovich and Popov (2003) and Levi Yeyati et al. (2013) find a positive correlation between FX reserve accumulation and RER levels, as well as between reserve accumulation and economic growth. Similarly, Prasad et al. (2007) find that current account balances are highly and positively associated with both undervalued currencies and economic growth.

The mechanism discussed above highlights that international capital markets operate with many imperfections that can jeopardize long-term economic performance, particularly in developing countries. Consequently, these countries need to establish safe linkages with international markets to minimize their reliance on foreign savings and the probability of crises. It is important to note that this refers to the composition of savings. A higher RER helps to reduce the domestic absorption of tradables while promoting the domestic production of tradables, thus lowering *foreign* saving. At the same time, a higher RER level implies a transfer of income from workers to firms via the decline in real wages generated by the rise in tradable prices. If workers have a lower propensity to save than firms, the redistribution would result in higher *domestic* savings. The effect of a higher RER level on *aggregate* savings would be determined by the effect of these two. While evidence concerning the complete effect is not entirely clear, it seems to suggest that RER levels and aggregate saving rates are positively associated.

In our view, the strongest mechanism is one that rests on the key role that “modern” tradable activities play in the process of economic development. Essentially, this mechanism perceives economic development as a process characterized by a rapid and intense structural transformation from low-productivity to high-productivity activities that are largely tradable. While “modern” tradables have traditionally been associated with manufactures, there is now recognition that some services (e.g., software) and knowledge-intensive agricultural activities (e.g., seed production) are also part of this group. The tradable-led growth channel can be seen as comprising three broad elements:

- (i) Modern tradable activities are intrinsically more productive or operate under some sort of increasing returns to scale.⁷
- (ii) Given this trait, the reallocation of (current and future) resources to these activities – i.e. structural change – accelerates GDP per capita growth.
- (iii) Accumulation in these activities depends on their profitability, which in turn depends on the level of the RER. Rapid capital accumulation requires a sufficiently competitive (high) RER to compensate for the market failures caused by the increasing returns.

A large number of specific mechanisms have been advanced with this general logic. In an influential article, Rodrik (2008) indicates that modern tradable activities are disproportionately affected by market and institutional failures. Using an endogenous growth model, he shows that the resulting misallocation of resources towards non-tradables leads to slower economic growth, whereby a high RER can be a second-best policy that compensates for the market and institutional failures, improves tradable profitability and accelerates economic growth.

Of course, Rodrik is not the first to emphasise the important interplay between RER levels and market failures in economic development. Learning externalities, for instance, imply that infant industries in the tradable sector can benefit from temporary protection against foreign competition via a transitory trade policy or currency undervaluation (Ros, 2013). Similarly, temporary currency overvaluation can lead to de-industrialization and lower growth – as in the Dutch disease case – when tradable firms' production is subject to some form of increasing returns to scale (e.g. Krugman, 1987, and Ros and Skott, 1998). The opposite case – transitory currency undervaluation – can spur a virtuous dynamics of structural change and economic development (Rapetti, 2013). Models of export-led growth and modern trade theory have emphasized positive externalities that are not equally prevalent in non-export activities; therefore, policies reallocating resources to export industries – like a SCRRER policy – promote higher growth (e.g. de Melo and Robinson, 1992).

Another mechanism emphasizes that the lack of FX may constrain economic growth in

developing countries. This idea has a long tradition in the United Nations Economic Commission for Latin America and the Caribbean (CEPAL) structuralist economics (Ocampo, 2014) and the balance-of-payments-constrained growth literature initiated by Thirwall (1979). However, it remains a matter of debate whether the RER can help to alleviate the FX constrain and favour growth. Under the “elasticity pessimism” view of the old structuralists, the level of the RER was unimportant. A similar view emerges from the Thirwall-type of models. In such settings, long-run growth is demand constrained, i.e. constrained by foreign *demand* of domestic tradables (i.e. exports). The level of the RER is neutral on growth dynamics because only a continuous real depreciation can foster growth via substitution effects on a given rate of foreign demand growth.

These pessimistic views overlook the possibility that the FX constraint on growth may depend on supply-side factors. As emphasized above, the RER is a key determinant of tradable profitability and thus capital accumulation: in other words, the level of RER is a key determinant of the long-run *supply* of domestic tradables. If foreign demand for (at least) some tradables is large at a given international price (i.e., highly or perfectly elastic), then a higher RER level would increase exports, relax the FX constraint and accelerate growth. Thus, the point under dispute is to what extent export growth depends on foreign demand growth *vis-à-vis* domestic tradable firms' ability to profitably expand their supply at the given international prices. Indeed, this has recently become an area of intense debate in certain circles.⁸ Evidence seems to side with the view that the level of the RER does play an important role in the behaviour of tradable supply and thus in relaxing the FX constraint on growth.

For instance, Freund and Pierola (2012) detect 92 episodes of sustained manufacturing export growth and show that they tend to be preceded by real currency undervaluations. Their findings suggest that high RERs help entry into new exports products and new markets (i.e. extensive margin) in developing countries. Colacelli (2010) also finds strong evidence that the extensive margin of trade is very responsive to RER changes. Cimoli et al. (2013) work with a panel of 111 countries over 1962–2008, finding that higher RERs favour export diversification. In turn, exports diversification is associated with an upgrading in the technological intensity of exports and higher economic growth. McMillan

and Rodrik (2011) use a panel data of nine sectors in 38 countries over the period 1990–2005 and find that level of the RER favours structural change in favour of modern tradables and the flow of labour from low-productivity to high-productivity tradable activities. Similarly, Eichengreen (2008) works with a panel of 28 industries for 40 emerging market countries covering the period 1985–2003, finding that higher and more stable RER levels favour tradable employment growth.

To summarize, there are both sensible explanations and a significant amount of evidence to believe that stable and competitive RER levels favour economic growth in developing countries. A SCRER appears to be growth-enhancing because it: (a) minimizes the risks of currency and financial crises and sudden stops; (b) relaxes the FX constraint on sustained economic growth; and more importantly, (c) stimulates modern tradable activities that are key for economic development.

II. SCRER management

From the strict perspective of conventional economic theory, managing a relative price – like the RER – sounds like a heresy. Because speeds of price adjustment vary from market to market and therefore some prices are stickier than others, conventional economic theory could concede that managing a relative price would only be possible in the short run. However, if deviations from equilibrium are only transitory, what would the purpose of such an objective be?

Economists know that the real world is substantially more complex than any abstract representation of it and that policy making requires some degree of eclecticism. This pervades the conduct of macroeconomic policy. For instance, it is widely recognized that nominal exchange rates – like the price of any other financial asset – are highly volatile and frequently follow long swings. Thus, conventional wisdom on macroeconomic policy suggests that central banks should curb RER movements that are not associated with changes in economic fundamentals. Most central banks in developing countries – where exchange rate volatility is high – follow this recipe. They conduct *sui generis* inflation-targeting regimes in which exchange rates are managed through interventions in the FX market that seek to avoid this kind of non-fundamental volatility.⁹

A SCRER strategy challenges this view because its goal is not to manage the RER to avoid short-run misalignments, but rather to keep it competitive in the medium run. As discussed in the previous section, a central assumption is that modern tradables operate under some form of increasing returns, thus making their expansion favourable for economic

growth. Economic theory establishes that multiple equilibria arise in the presence of increasing returns to scale. Targeting a SCRER can thus be conceived as a strategy seeking to move the economy from one equilibrium to another. Because some of the gains from investing are difficult to internalize by the firms under normal conditions, an RER higher than equilibrium gives proper incentives to invest. Sustained capital accumulation in the modern tradable sector puts the economy on a trajectory towards a better equilibrium, in which the size of this sector is significantly larger. However, if incentives are weak and volatile, capital accumulation may not follow. RER competitiveness thus has to be sufficiently stable and durable to induce investment, which may likely require managing the RER beyond the short run.

Targeting a SCRER beyond the short run is a strategy that has a long-run goal – i.e. to accelerate growth – but needs to be compatible with the conventional short-run goals of macroeconomic policy. In other words, macroeconomic policy under this regime needs to keep the RER stable and competitive while achieving full employment, low inflation (i.e. internal equilibrium) and current account sustainability (i.e. external balance). Addressing all these issues simultaneously is not an easy task; rather, it requires the coordination of several policies.

A. SCRER and external equilibrium

Attaining external equilibrium under a SCRER regime is probably the least controversial aspect. As discussed in section I, a SCRER strategy tends to be associated with current account surpluses or low

deficits and the accumulation of international reserves by the central bank, because it stimulates the supply of and limits the demand for tradables. Countries are in a stronger position to deal with negative external shocks and reduce the chances of sudden stops of capital inflows. Moreover, a SCRER strategy makes it very unlikely that the economy follows unsustainable trajectories regarding its international assets position. The most likely case is that the country would reduce its net foreign debt or increase its net asset position.

If anything, the concerns relate to whether accumulating foreign assets is *optimal*. While textbook treatments consider sustained current account deficits and surpluses as cases of external imbalances, this characterization misses an important distinction. A sustained current account deficit implies that domestic agents are continuously issuing foreign debt. In turn, a sustained current account surplus implies that domestic agents are postponing spending indefinitely. In the first case, the behaviour is probably desirable but unsustainable. One would like to consume beyond their means, but the problem is to find someone willing to finance such behaviour. In the second case, the behaviour is sustainable but arguably suboptimal. One can sustainably finance someone else's spending; rather, the issue is whether there is a reason to do so.

In the case of a country following a SCRER strategy, it may be desirable to accumulate foreign assets – and therefore finance other countries' spending – if the country manages to reach a higher level of development by doing so. The discussions about the “global imbalance” have never pointed to China's inability to maintain its current account surplus, but rather whether the United States could keep running current account deficits or the potential bubbles that such financing could cause on the United States and European financial markets. These considerations relate to the important issue of the global consequences of conducting a SCRER strategy, but are unrelated to specifics concerning how such a strategy is conducted at the national level.

B. SCRER and internal equilibrium¹⁰

Internal equilibrium – full employment with low inflation – is usually tackled through monetary policy. In the case of a SCRER strategy, the central bank needs to manage the nominal exchange rate to achieve the targeted SCRER, as well as the interest rate to regulate the liquidity and influence the pace

of aggregate demand. This immediately brings in the well-known policy trilemma, establishing that it is impossible for a central bank to simultaneously control the exchange rate and the interest rate in an economy open to capital flows.

One way to avoid such difficulties is to use controls on capital inflows. Several countries have successfully used this instrument. Evidence appears to suggest that capital controls reduce the share of short-term inflows and lower exchange rate volatility. Many scholars highlight the benefits of capital management techniques for macroeconomic management, especially in developing countries (Gallagher et al., 2012). Even the IMF, who had fiercely opposed them in the past, now perceives a role for them in the macroeconomic policy toolkit (IMF, 2010). Despite their increasing acceptance within the profession, it seems uncontroversial that they constitute an imperfect instrument to isolate domestic financial markets from the international capital market. If a central bank wants to use monetary and exchange rate policies simultaneously, it would surely need additional instruments.

Sterilized FX interventions can be useful in this regard. In a situation of excess supply of FX at the targeted exchange rate – a likely scenario in a country following a SCRER strategy that runs a current account surplus or a small deficit – the central bank can control both the prevailing exchange and the interest rate. It can purchase all the excess supply of international currency in the FX market and sterilize the monetary effect of such an intervention through issuing bonds in the money market. The central bank has two instruments available to achieve its two targets: intervention in the FX market to control the exchange rate and the sterilization in the money market to control the interest rate. Accordingly, Tinbergen's maxim is fulfilled.

A fully sterilized intervention in a situation of excess supply of international currency at the targeted exchange rate can be considered a policy implemented in two steps. First, the central bank's intervention in the FX market generates a monetary expansion. The resulting situation would show a higher amount of monetary base, the same amount of domestic bonds and an interest rate lower than the initial one. In the second step, the sterilization fully compensates for the change in the private portfolio that took place in the first step, whereby the central bank absorbs the increment of the monetary base

and issues an amount of domestic assets equal to the initial excess demand for domestic assets (the excess supply of international currency), returning the domestic interest rate to its previous level.

Note that the excess supply of international currency at the targeted exchange rate is tantamount to an excess demand of domestic assets. If the central bank can supply such an asset, the trilemma would be invalid.¹¹ Certainly, in a situation of excess demand of FX at the targeted exchange rate, the predictions of the trilemma continue to be valid. The central bank's capacity to intervene in such a situation is limited by its stock of international reserves. However, there is no symmetry between situations of excess demand and excess supply of FX: while the trilemma is valid in the first case, it is not true in the second. The asymmetry lies in the fact that in the first case, sterilization is constrained by a fixed stock (i.e. FX reserves), while in the second, sterilization may be carried out indefinitely due to an accommodating stock (i.e. the central bank's bonds). The central bank's ability to issue bonds but not FX reserves is the key difference. It seems that this conclusion is not generally acknowledged because the literature discussing monetary autonomy and exchange regimes rarely considers situations of excess supply of FX.

Even if circumventing the trilemma is feasible in cases of excess supply of foreign currency, one may wonder about the sustainability of such a strategy. This depends on the potential cost that the central bank faces when performing these operations. At a given targeted exchange rate, a sustained policy of fully sterilized interventions implies no change in the central bank's net worth. The asset side of its balance sheet increases by the increment of FX reserves and the liability side by the bonds issued to sterilize, with both magnitudes initially of equal value. The cost depends on the yield of the FX reserves compared to the interest rate that the sterilising bonds pay. Since FX reserves are typically allocated in low risk assets – e.g. United States bonds – the yield of FX reserves are likely to be lower than the bonds interest rate (Rodrik, 2006). However, note that the full cost of the operation also depends on the capital gains or losses associated with the variation of the exchange rate in time: if it depreciates (appreciates), the yield of FX reserves increases (diminishes) by the rate of depreciation. Note that if the central bank follows some sort of uncovered interest parity rule¹² to manage the exchange rate – devaluing by a rate equal to the difference between the interest rate that

the central bank's bonds pay and the one paid for the international reserves – the marginal cost of sterilization would be nil (Bofinger and Wollmershäuser, 2003). However, even if the marginal cost is positive, the policy may be financially sustainable. This would depend on the whole asset and liability structure of the central bank's balance sheet and the corresponding yields. Frenkel (2008) analyses sustainability conditions for sterilized FX interventions considering reasonable balance sheet structures, concluding that they are sustainable as long as the interest rate of monetary policy is “moderate”, which critically depends on sovereign and currency risk premia.

Sterilized FX intervention may be sustainable even if it generates a net positive cost to the central bank. This would imply that the Treasury has to finance the central bank's deficit, whereby this decision would depend on a cost-benefit analysis of the strategy. If the costs of the sterilized interventions on which the SCRER strategy is based are low compared to the benefits in terms of structural change and development, then it may worth financing them. As John Williamson (1996: 30) pointed out regarding the cost of sterilization in Chile's SCRER policy during the 1990s: “[if paying 1-1.5 per cent of GDP] is the price of preserving a model that works, it would be cheap”.

Despite the arguments developed thus far, it is possible that under certain conditions the interest rate required to attain internal equilibrium would be too high to make sterilization financially sustainable. Capital regulations could help in this scenario, but it is also imaginable that inflows would find ways to at least partially circumvent them. These considerations highlight the fact that financial integration with international markets makes monetary policy not completely independent. For this reason, fiscal policy also needs to play a role in the management of aggregate demand under a SCRER framework. Given that most public spending items and taxes are rigid and their modification typically requires legislative treatment, authorities need to develop some fiscal instrument that is sufficiently flexible to help monetary policy to conduct counter-cyclical policy. Indeed, some countries have successfully developed counter-cyclical fiscal funds that play such a role.

Managing aggregate demand under a SCRER strategy thus requires the coordination of policies, including exchange rate, monetary, capital account and fiscal policies. If correctly coordinated, macroeconomic policy can properly respond to shocks and

manage aggregate demand to attain internal equilibrium. However, it is important to bear in mind that a SCRER strategy can have an inflationary bias even if macroeconomic policy is adequately coordinated. A competitive or high RER implies that real wages – or more specifically, wages in terms of tradable prices – are lower than they could be if the RER were at equilibrium. Thus, even if aggregate demand is not generating inflationary pressures in the goods markets, inflation may still accelerate due to wage inflation pressures arising from workers' perception that wages are too low. Wage aspirations are not only influenced by the degree of unemployment, but also by history, social norms and institutions.

Thus, keeping a RER competitive beyond the short run may ultimately depend on developing some mechanism that makes workers' wage aspirations compatible with modern tradable sector's profitability. Authorities would need to convince workers and their leaders that their cooperation in terms of prudent wage aspirations are not only beneficial for modern tradable activities, but also workers themselves, because under cooperation real wages would be higher in the medium run. Social agreements between governments, firms and workers linking real wages to productivity in key tradable activities may thus be an important element in a successful competitive RER strategy for development.¹³

III. Conclusions

Today's mainstream approach to macroeconomic policy is to conduct inflation-targeting regimes with the dominant goal of a low and stable inflation rate. Additionally, exchange rates are managed through FX interventions seeking to avoid short-run volatility that is unassociated with economic fundamentals. A common result of this kind of approach has been RERs that are volatile and domestic currency is overvalued, which may represent an obstacle for long-run growth.

In this chapter, we have made the case for an alternative approach, suggesting that attaining standard

macro-policy objectives while targeting a SCRER is viable. The proposed scheme is certainly more complex than a standard inflation-targeting framework because it adds an additional target to macroeconomic policy, namely the RER. However, evidence persuasively suggests that SCRERs tend to foster economic growth and development. Therefore, developing countries should evaluate the possibility of adopting this development-friendly approach to macroeconomic policy.

Notes

- 1 Equilibrium RER is a concept that generates no few confusions and debates. For simplicity, we define it here as the one at which the economy is at macroeconomic equilibrium (i.e. full employment with low inflation and external balance). It depends on deep economic fundamentals (e.g. productivity), exogenous variables (e.g. international interest rate) and policy variables (e.g. public spending).
- 2 See Bresser-Pereira (2010) for a similar definition.
- 3 This part draws on Rapetti (2014).
- 4 While we do not discuss the association between RER levels and employment here, there is evidence suggesting that SCRERs tend to make growth more labour-intensive. See Frenkel and Ros (2006) and Damill and Frenkel (2012).
- 5 See, for instance, Razmi (2007) for a theoretical and empirical discussion and the references therein.
- 6 Frenkel (1983) analyses and formalizes this kind of dynamics. English readers can check Frenkel (2003) and Frenkel and Rapetti (2009).
- 7 This is a main characteristic emphasized by the pioneers of development economics such as Rosenstein-Rodan (1943) and Hirschman (1958).
- 8 See, for instance, Razmi (2013), Cimoli et al. (2013) and Marques Ribeiro et al. (2014).
- 9 See, for instance, the analysis of Chang (2008) for the case of Latin American inflation targeters.
- 10 This section draws on Frenkel (2007), Frenkel (2008), Frenkel and Rapetti (2008) and Rapetti (2013).
- 11 Except for special circumstances, public debt instruments – including those issued by the central bank – are the least risky assets in a developing economy. The interest rate of such instruments set the floor of the other interest rates in the economy. In fact, this is the very basis for conducting monetary policy via an interest rate set by the central bank. Thus, unless there is an institutional constraint, central banks should be able to offer such an asset and perform sterilization operations.
- 12 UIP stands for uncovered interest parity, which states that portfolio decisions should lead to domestic interest rate being equal to the sum of foreign interest rate and the expected rate of exchange rate variation.
- 13 In commodity-exporting countries, such an agreement could be complemented with special taxes on rents, whereby the proceeds are used to finance social transfers that function as indirect wages.

References

- Aguirre A and Calderón C (2005). Real exchange rate misalignments and economic performance. Central Bank of Chile, Working Paper No. 315. Santiago.
- Aizenman J and Lee J (2007). International Reserves: Precautionary Versus Mercantilist Views, Theory and Evidence. *Open Economies Review*, 18(2): 191–214.
- Bagnai A (2012). Unhappy Families Are All Alike: Minskian Cycles, Kaldorian Growth, and the Eurozone Peripheral Crises. *Iniciativa para la Transparencia Financiera*, Available at www.itf.org.ar/pdf/documentos/87_2012.pdf.
- Bereau S, López Villavicencio A and Mignon V (2012). Currency Misalignment and Growth: A New Look Using Nonlinear Panel Data Methods. *Applied Economics*, 44: 3503–3511.
- Bofinger P and Wollmershäuser T (2003). Managed Floating as a Monetary Policy Strategy. *Economic Change and Restructuring*, 36(2): 81–109.
- Bresser-Pereira LC (2010). *Globalization and Competition*. Cambridge, Cambridge University Press.
- Cesaratto S (2012). Controversial and novel features of the Eurozone crisis as a balance of payment crisis. Cuaderni del dipartimento di economia politica e statistica, n. 640. Department of Economics, University of Siena.
- Chang R (2008). Inflation Targeting, Reserves Accumulation, and Exchange Rate Management in Latin America. Borradores de Economía 487, Banco de la República de Colombia.
- Cimoli M, Fleitas S and Porcile G (2013). Technological intensity of the export structure and the real exchange rate. *Economics of innovation and new technology*, 22(3/4): 353–372.
- Colacelli M (2010). Intensive and Extensive Margin of Exports and Real Exchange Rates. Mimeo.
- Cottani J, Cavallo D and Khan SM (1990). Real Exchange Rate Behavior and Economic Performance in LDCs. *Economic Development and Cultural Change*, 39: 61–76.
- Damill M and Frenkel R (2012). Macroeconomic policies, growth, employment, and inequality in Latin America. WIDER Working Paper No. 2012/23, WIDER.
- de Melo J and Robinson S (1992). Productivity and Externalities: Models of Export-led Growth. *The Journal of International Trade and Economic Development*, 1(1): 41–68.

- Di Nino V, Eichengreen B and Sbracia M (2011). Real Exchange Rates, Trade, and Growth: Italy 1861–2011. Bank of Italy, Economic Research and International Relations Area.
- Dollar D (1992). Outward-oriented Developing Economies Really do Grow More Rapidly: Evidence from 95 LDCs, 1976–1985. *Economic Development and Cultural Change*, 40(3): 523–544.
- Eichengreen B (2008). The Real Exchange Rate and Economic Growth. Commission on Growth and Development Working Paper No. 4. The World Bank, Washington, DC.
- Frenkel R (1983). Mercado financiero, expectativas cambiarias y movimientos de capital. *El Trimestre Económico*, 200: 2041–2076.
- Frenkel R (2003). Globalization and Financial Crisis in Latin America, *Cepal Review* 80: 41–54.
- Frenkel R (2007). The Sustainability of Sterilization Policy. *CEPAL Review* 93: 29–36.
- Frenkel R (2008). The competitive real exchange-rate regime, inflation and monetary policy. *CEPAL Review* 96: 191–201.
- Frenkel R (2013). Lessons from a Comparative Analysis of Financial Crises. *Comparative Economic Studies*, 55(2): 1–26.
- Frenkel R and Rapetti M (2008). Five Years of Stable and Competitive Real Exchange Rate in Argentina. *International Review of Applied Economics*, 22(2): 215–226.
- Frenkel R and Rapetti M (2009). A Developing Country View of the Current Global Crisis: What Should Not Be Forgotten and What Should Be Done.” *Cambridge Journal of Economics*, 33(4): 685–702.
- Frenkel R and Rapetti M (2012). Exchange Rate Regimes in the Major Latin America Countries since the 1950s: Lessons from History. *Revista de Historia Económica-Journal of Iberian and Latin American Economic History*, 30(1): 157–188.
- Frenkel R and Ros J (2006). Unemployment and the real exchange rate in Latin America. *World Development*, 34(4): 631–646.
- Freund C and Pierola MD (2012). Export surges. *Journal of Development Economics* 97(2): 387–395.
- Gala P (2008). Real exchange rate levels and economic development: theoretical analysis and econometric evidence. *Cambridge Journal of Economics*, 32(2): 273–288.
- Gallagher KP, Griffith-Jones S and Ocampo JA (2012). *Regulating global capital flows for long-run development*. Pardee Center Task Force Report, Boston, Mass., Fredrick S. Pardee Center for the Study of the Longer Range Future.
- Hausmann R, Pritchett L and Rodrik D (2005). Growth accelerations. *Journal of Economic Growth*, 10(4): 303–329.
- Hirschman A (1958). *The Strategy of Economic Development*. London, Yale University Press.
- IMF (2010). Capital Inflows: The Role of Controls. IMF Staff Position Note, International Monetary Fund.
- Johnson S, Larson W, Papageorgiou C and Subramanian A (2009). Is newer better? Penn World Table Revision and their impact on growth estimates. *Journal of Monetary Economics*, 60(2): 255–274.
- Krugman P (1987). The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher. *Journal of Development Economics*, 27(1–2): 41–55.
- Levy-Yeyati E, Sturzenegger F and Gluzmann P (2007). Fear of appreciation. *Journal of Development Economics*, 101: 233–247.
- Libman E (2014). Tipo de cambio real y crecimiento. Reseña de la literatura y resultados empíricos adicionales. *Desarrollo Económico*, forthcoming.
- MacDonald R and Vieira F (2010). A panel data investigation of real exchange rate misalignment and growth. CESifo Working Paper No. 3061, Fiscal Policy, Macroeconomics and Growth.
- Marques Ribeiro R, Tadeu-Lima G and McCombie J (2014). Exchange Rate, Income Distribution and Technical Change in a Balance-of-Payments Constrained Growth Model. Mimeo.
- McMillan M and Rodrik D (2011). Globalization, Structural Change and Productivity Growth. NBER Working Paper 17143, National Bureau of Economic Research, Cambridge, MA.
- Ocampo JA (2014). Balance of Payments Dominances: Its Implications for Macroeconomic Policy. In: Damill M, Rapetti M and Rozenwurcel G, eds. *Macroeconomics and Development: Essays in Honor of Roberto Frenkel*. Forthcoming.
- Polterovich V and Popov V (2003). Accumulation of Foreign Exchange Reserves and Long Term Growth. MPRA Paper 20069, University Library of Munich, Germany.
- Prasad ES, Rajan RG, and Subramanian A (2007). Foreign Capital and Economic Growth. *Brookings Papers on Economic Activity*, 1: 153–209.
- Rapetti, M (2013). Macroeconomic policy coordination in a competitive real exchange rate strategy for development. *Journal of Globalization and Development*, 3(2): 1–31.
- Rapetti M (2014). The Real Exchange Rate and Economic Growth: Some Observations on the Possible Channels. In: Damill M, Rapetti M, and Rozenwurcel G, eds. *Macroeconomics and Development: Essays in Honor of Roberto Frenkel*. Forthcoming.
- Rapetti M, Skott P and Razmi A (2012). The Real Exchange Rate and Economic Growth: Are Developing Countries Special? *International Review of Applied Economics*, 26(6): 735–753.
- Razin O and Collins SM (1999). Real exchange rate misalignments and growth. In: Razin A and Sadka E, eds. *The Economics of Globalization: Policy Perspectives from Public Economics*. Cambridge, Cambridge University Press.

- Razmi A (2007). The Contractionary Short-Run Effects of Nominal Devaluation in Developing Countries: Some Neglected Nuances. *International Review of Applied Economics*, 21(5): 83–109.
- Razmi A, Rapetti M and Skott P (2012). The Real Exchange Rate and Economic Development. *Structural Change and Economic Dynamics*, 23(2): 151–169.
- Razmi A (2013). Correctly Analyzing the Balance of Payment Constraint on Growth. UMASS Amherst Economics Working Papers 2013–12, University of Massachusetts Amherst, Department of Economics.
- Rodrik D (2006). The Social Cost of Foreign Exchange Reserves. *International Economic Journal*, 20(3): 253–266.
- Rodrik D (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activity*, 2: 365–412.
- Ros J (2013). Rethinking Economic Development, Growth and Institutions. Oxford, Oxford University Press.
- Ros J and Skott P (1998). Dynamic effects of trade liberalization and currency overvaluation under conditions of increasing returns. *The Manchester School*, 66(4): 466–489.
- Rosenstein-Rodan P (1943). Problems of Industrialization of Eastern and South-Eastern Europe. *Economic Journal*, 53(2): 202–211.
- Taylor L (1998). Capital Market Crises: Liberalization, Fixed Exchange Rates and Market-Driven Destabilization. *Cambridge Journal of Economics*, 22(6): 663–676.
- Thirwall A (1979). The Balance of Payments Constraint as an Explanation of International Growth Rate Differences. *Banca Nazionale del Lavoro Quarterly Review*, 32(128): 45–53.
- Williamson J (1996). *The Crawling Band as an Exchange Rate Regime: Lessons from Chile, Columbia, and Israel*. Peterson Institute for International Economics. Washington, DC.