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Three Key Levels of the Real Exchange Rate in Latin America[1]

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Abstract: The article presents a simple three-sector macroeconomic model that incorporates key structural features common to many Latin American economies. The model allows for the formal identification of three benchmark levels of the real exchange rate (RER). The *macroeconomic equilibrium* RER is the level consistent with the simultaneous achievement of internal and external balance (i.e. full employment and a sustainable balance of payments). The *social equilibrium* RER corresponds to a state in which workers, at full employment, obtain a real wage consistent with their income aspirations. The *developmental* RER is defined as a benchmark level that ensures the labor-absorbing tradable sector earns a risk-adjusted rate of profit comparable to that in developed countries, thereby fostering investment. The three-RER-levels framework provides a unified analytical setting to organize and compare alternative theories developed in Latin America – including unbalanced productive structures, distributive conflict, structural inflation, macroeconomic populism, and stop-and-go cycles – and to clarify how different configurations of the benchmark RER levels underpin competing diagnoses and development strategies in the region.

Keywords: real exchange rate; Latin America; equilibrium; conflict; development

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1 Introduction

A quick look at the history of macroeconomic thought shows that most canonical macroeconomic models have been developed within a one-sector, closed-economy framework. This includes the IS–LM model, the Solow growth model, RBC and DSGE models, as well as Post-Keynesian and Kaleckian frameworks. Open-economy and multi-sector versions have typically been introduced as *extensions* rather than as baseline models.

This bias probably reflects the fact that these frameworks were developed primarily with advanced economies such as the United States (or earlier, the United Kingdom) in mind. For economies with mature productive structures, a one-sector closed-economy framework may provide a reasonable first approximation, as their business cycles tend to be less affected by international trade and financial flows. It may not be surprising that some of the most influential open-economy extensions were developed by economists working on smaller open economies. The cases of Mundell (1963), a Canadian economist who extended the IS-LM model to the open-economy case, and Salter (1959) and Swan (1960), both Australian economists who expanded the one-sector Neoclassical model into a two-sector (tradable/non-tradable) framework, provide interesting examples.

Macroeconomists in Latin America have long worked within open-economy, multi-sector frameworks. This orientation gave rise to the Structuralist tradition, which explicitly incorporates trade and financial linkages with the global economy and accounts for heterogeneous productive structures.[2] Within this tradition, the real exchange rate (RER) has played a central analytical role. As a relative price between domestic and foreign goods, it affects the balance of payments, output, and employment; as a relative price between tradable and non-tradable goods, it shapes resource allocation and productive structure; and through its inverse relation with real wages, it is closely linked to income distribution and social relations.

This paper presents a static three-sector open-economy model designed to capture key structural features common to most Latin American economies.[3] The economy comprises two tradable sectors and one non-tradable sector. One tradable sector is a net exporter of natural resources and employs relatively little labor. The

2 At this point, it is tempting to argue that *all* macroeconomic theory is structuralist in Lance Taylor's sense (1983) that productive, social and institutional structures are key for macroeconomic outcomes and analyses. Under this view, the prevalence of the one-sector closed-economy framework could be seen as a structuralist way to model a mature economy, like the US.

3 The characterization of the economy in this paper fits best the case of South American countries. However, since the relevance of the RER has also been prevalent among some economists working in Central and North American countries – particularly in Mexico – I will broadly refer to Latin America.

other tradable sector is a net importer and absorbs a significantly larger share of employment, and is therefore referred to as *labor-absorbing*. The non-tradable sector is labor-intensive and accounts for the largest share of total employment.

Although the model is relatively simple and suitable for analytical and teaching purposes, its contribution is not primarily pedagogical. Its main contribution is the formal identification of three key levels of the real exchange rate. The *macroeconomic equilibrium* RER is the level consistent with the simultaneous achievement of internal and external balance (i.e. full employment and a sustainable balance of payments). The *social equilibrium* RER corresponds to the real exchange rate at which workers obtain their desired real wage under full employment. The *developmental* RER is the level that allows the labor-absorbing tradable sector to earn a rate of profit at least equal to the risk-adjusted return obtained by comparable firms in developed economies, thereby generating incentives for investment.

While similar concepts have appeared in previous theoretical and policy debates in Latin America, the model provides precise and internally consistent definitions of these three RER levels within a unified formal framework. It shows that they are benchmark levels determined by underlying structural – or state – variables and exogenous external conditions that are given in the short run.

The three-level RER framework offers a simple analytical apparatus to interpret several influential theories in Latin American macroeconomics, including unbalanced productive structures, distributive conflict, structural inflation, macroeconomic populism, and stop-and-go cycles. It also provides a common framework for organizing the debate over development strategies, ranging from macroeconomic stability-oriented approaches, to developmentalist strategies centered on a competitive RER, to demand-led approaches that emphasize expansionary macroeconomic policies. These positions are reflected, for example, in the Brazilian debate between New Developmentalism and Social Developmentalism (Prates et al. 2017).

The remainder of the paper is organized as follows. Section 2 presents the model. Section 3 defines the three key levels of the RER. Section 4 relates the framework to major strands of Latin American macroeconomic thought and development debates. Section 5 concludes. Some formal derivations are collected in a mathematical appendix at the end of the article.

2 The Model

The stylized economy features three productive sectors: R, M, and N. Sectors R and M are tradable, while sector N is non-tradable. Sector R is a net exporter of natural resource commodities and can be interpreted as a composite good including food, minerals, and energy. It operates with state-of-the-art technology, allowing it to

attain productivity levels comparable to those of similar activities in developed economies.

Sector M is a net importer and produces a composite good consisting of manufactures and tradable services, such as software and IT services, used for both consumption and investment. Production in this sector requires capital and labor, and its labor productivity is lower than that of comparable sectors in developed countries.

Sector N is non-tradable and produces a composite of non-tradable services and manufactures. It employs both labor and capital and operates under imperfect competition.

The economy is populated by two social groups: wage earners and capital owners. Wage earners supply homogeneous labor services to firms in sectors M and N at a nominal wage rate W, which is taken as given in the short run.

Since the focus of the analysis is on the real side of the economy, financial variables are treated as exogenous. Accordingly, the model does not explicitly describe the behavior of the central bank, domestic financial markets, or their interaction with foreign financial markets. This abstraction allows the analysis to concentrate on the real mechanisms relevant for identifying the benchmark levels of the real exchange rate.

2.1 Production

The commodity-sector R produces using only capital, with a constant output-capital ratio, a_K, and its good is only used for consumption.

$$Y_R = a_K K_R \tag{1}$$

M goods can be used for consumption and investment and are produced with a standard neoclassical production function.

$$Y_M = F(L_M, K_M) \tag{2}$$

with $F_i^{'} > 0, F_i^{''} < 0, i = L_M, K_M$.

The good N is used for consumption and produced with a fixed-coefficients production function.

$$Y_N = \min(a_N K_N, y_N L_N) \tag{3}$$

It is also assumed that the capital stock is not binding, thus making $Y_N = y_N L_N$.

2.2 Prices

Since the economy is small, both tradable sectors are price-takers and set their prices according to the law of one price:

$$P_R = \mathrm{EP}_R^* \tag{4}$$

$$P_M = \mathrm{EP}_M^* \tag{5}$$

where E is the nominal exchange rate defined as the domestic price of a foreign currency and the star (*) refers to the international price in foreign currency. The price of N is determined by a constant mark-up (μ) over unit labor costs.

$$P_N = (1+\mu)\frac{W}{y_N} \tag{6}$$

These three absolute prices yield three relative prices: P_R/P_M, P_R/P_N and P_M/P_N. Setting the international price of M as numeraire $P_M^* = 1$, we get:

$$\frac{P_R}{P_M} = \frac{P_R^*}{P_M^*} = \rho^* \tag{7}$$

$$\frac{P_R}{P_N} = P_R^*\frac{E}{W}\frac{y_N}{(1+\mu)} = \rho^* q\frac{y_N}{(1+\mu)} \tag{8}$$

$$\frac{P_M}{P_N} = P_M^*\frac{E}{W}\frac{y_N}{(1+\mu)} = q\frac{y_N}{(1+\mu)} \tag{9}$$

where $\rho^* \equiv P_R^*/P_M^*$ is the international terms of trade – defined as the relative price of exports over imports – and $q \equiv w_E{}^{-1} \equiv (W/E)^{-1}$ is the inverse of the wage rate in terms of foreign currency. ρ^* and q are the key relative prices of this economy. As shown in Section 3, q can be interpreted as the real exchange rate of this economy. It is important to notice that while ρ^* is determined in the international goods market, q is determined in the home economy.

2.3 Policy Instruments

Macroeconomic policy in this economy is carried out through two instruments: θ and q.

The variable θ represents the expenditure-changing instrument of macroeconomic policy. An increase (decrease) in θ represents a policy that stimulates (curbs)

domestic absorption. Monetary, fiscal, and incomes policies are all components of θ. These instruments are summarized in a single variable to keep the analysis tractable, avoiding the need to model central bank behavior, financial markets, or fiscal and public-debt dynamics explicitly.

Since the late 1990s, Latin American countries have increasingly adopted flexible exchange rate regimes. In practice, however, most operate under managed floating rather than freely floating arrangements. Given that domestic foreign exchange markets are small relative to capital flows, exchange rate movements can be sharp and excessive, generating undesirable real exchange rate volatility and misalignment. Because nominal wages are substantially stickier than the nominal exchange rate, exchange rate management provides an effective channel to influence the real exchange rate. In the model, nominal wages (W) are taken as given in the short run, allowing the government to affect q through exchange rate policy conducted via E.

Treating the real exchange rate as a policy instrument is not without controversy, but there are strong empirical grounds for doing so over short-to medium-run horizons. Since Mussa (1986), a large literature has shown that real and nominal exchange rate movements are nearly indistinguishable at horizons ranging from days to several years. This close comovement implies that nominal shocks translate almost one-for-one into real exchange rate fluctuations in the short run. Moreover, deviations of the real exchange rate from its long-run mean display very slow mean reversion, with half-lives typically between three and five years, as emphasized by Rogoff's (1996) PPP Puzzle and confirmed by subsequent studies (e.g. Burstein and Gopinath 2014). While long-run stationarity of the real exchange rate is widely accepted, the empirical evidence remains inconclusive, and some contributions question whether mean reversion can be reliably detected in available samples (e.g. Müller and Watson 2018).

Because of these empirical regularities, managed floating has become standard among emerging market economies as a way to influence the short-to medium-run behavior of the real exchange rate (Frenkel and Rapetti 2015; Ghosh et al. 2016; Frankel 2019). Of course, managed floating does not imply that governments can choose any real exchange rate level they wish. Rather, it means that they can influence its behavior within a reasonable and economically relevant range.

Accordingly, the assumption adopted here does not require full control over the real exchange rate, but only the ability to influence it within bounds relevant for macroeconomic policy. This approach follows a long-standing tradition in open-economy macroeconomics, which characterizes policy through an expenditure-changing instrument *(θ)* and an expenditure-switching instrument (q).

2.4 Consumption

Consistent with the stylized fact that workers' contribution to aggregate savings is typically low (Dynan et al. 2004), the model adopts the standard assumption that wage earners consume while capital owners save. Relative prices affect consumption behavior both through substitution and income effects. A rise in q makes both tradable goods more expensive relative to non-tradable goods and reduces the purchasing power of workers' income. A rise in ρ^* makes the R good more expensive relative to both M and N goods and also reduces wages' purchasing power. The degree of substitution between these groups of goods is an empirical question. Pure substitution is likely to be significant within each group of goods, whereas R, M and N may be seen more as complements than substitutes. Accordingly, the analysis assumes that income effects dominate substitution effects and that relative price changes proportionally affect consumption of each good.[4]

Under this behavior, assuming that only wage earners consume is equivalent to modeling relative price changes as operating through income redistribution between social groups. An increase in q redistributes income from wage earners to capital owners in sector M and, since only workers consume, leads to a contraction in the consumption of the three goods. Likewise, an increase in ρ^* redistributes income from wage earners to capital owners in sectors R and contracts consumption.

Given relative prices and the implied income distribution, workers' income depends on total employment (L) and the stance of macroeconomic policy, summarized by θ. Higher employment raises total labor income and, consequently, consumption demand. Similarly, an increase in θ – interpretable as fiscal transfers, tax reductions, or policies that ease credit conditions for workers – raises disposable income and liquidity, thereby expanding consumption demand.

Consumption demand for each good is represented by the following equations:

$$C_R = C_R\left(q, \rho^*, L, \theta\right), C_{\mathrm{Rq}} < 0, C_{R\rho^*} < 0, C_{\mathrm{RL}} > 0, C_{R\theta} > 0 \tag{10}$$

$$C_M = C_M\left(q, \rho^*, L, \theta\right), C_{\mathrm{Mq}} < 0, C_{M\rho^*} < 0, C_{\mathrm{ML}} > 0, C_{M\theta} > 0 \tag{11}$$

$$C_N = C_N\left(q, \rho^*, L, \theta\right), C_{\mathrm{Nq}} < 0, C_{N\rho^*} < 0, C_{\mathrm{NL}} > 0, C_{N\theta} > 0 \tag{12}$$

with C_{ij} being the partial derivative of consumption of good i with respect to the variable j.

4 This assumption is consistent with consumption behavior derived from utility maximization with Leontief preferences, although such preferences are not explicitly imposed in the model.

2.5 Employment

Total employment, L, is determined by the demand for labor in sectors M and N.

$$L \equiv L_M + L_N \tag{13}$$

Given that firms in sector M are price-takers in the international market, employment in this sector is supply-determined and is a positive function of q, as shown in equation (14). Using equation (2), profit-maximization implies that the marginal product of labor should be equal to the product wage, w_E in sector M.[5]

$$L_M = L_M(q) \quad L_{\mathrm{Mq}} > 0 \tag{14}$$

Employment in sector N is demand-determined. Because W is given in the short run, domestic demand for N goods – which consists of workers' consumption of N – determines the levels of output and employment in N. Equation (15) establishes the equilibrium condition for the market for N goods and, consequently, sectoral employment.

$$L_N = \frac{1}{y_N} C_N(q, \rho^*, L, \theta) \tag{15}$$

Employment in N moves with workers' consumption of N: it decreases with relative prices q and ρ^*, and increases with the level of employment *(L)* and the stance of macroeconomic policy *(θ)*.

Plugging (14) and (15) into (13) and using the implicit function theorem, we get total employment as a function of q, ρ^* and θ (see the appendix).

$$L = L(q, \rho^*, \theta) \quad L_q \lesseqgtr 0, L_{\rho^*} < 0, L_\theta > 0 \tag{16}$$

A rise in ρ^* reduces the purchasing power of workers' income and consequently reduces the consumption of N, employment in N, and total employment. An expansive macroeconomic policy stimulates the demand for N goods and raises employment in N and total employment.

The effect of a rise in q on total employment is ambiguous: it raises profits in M leading to an expansion of sectoral employment, but since it contracts demand for N goods, it reduces employment in N. Depending on which effect is stronger, employment can increase or fall. If the impact of a rise in q on workers' income is significant enough, then a devaluation would contract total employment. This would

5 The choice of a standard neoclassical production function for sector M allows the model to capture an empirically documented stylized fact in Latin America: higher real exchange rate levels tend to expand employment in labor-absorbing tradable activities (see Frenkel and Ros 2006; Galindo et al. 2007).

be a case of contractionary devaluation through income redistribution as originally discussed by Díaz Alejandro (1963), which we assume prevails.[6]

2.6 Investment

Investment decisions are taken by firms in sectors R, M, and N, and correspond to purchases of M goods. Investment demand in each sector (I_i) is modeled as a function of the expected returns on alternative assets, the sector's own capital stock (K_i), and the policy variable θ. The rationale – formalized in the appendix – is straightforward. In the absence of depreciation, investment represents additions to productive capital, so the scale of sectoral investment depends on the size of the existing capital stock, which acts as a scale factor. With the exception of sector R – where capital is proportional to output – a larger capital stock has an ambiguous effect on investment: scale effects demand larger investment, while the associated decline in profitability works in the opposite direction.

The effect of θ on investment in all three sectors is positive. A raise in θ can be interpreted as a policy that expands the liquidity available to firms, whether through standard expansionary monetary policy (e.g. lower policy interest rates or reserve requirements) or through more targeted investment policies such as tax exemptions, directed credit, subsidies, or combinations thereof.

Expected profitability is a central determinant of investment. Firms evaluate a limited set of alternatives. All firms can invest in a safe international financial asset yielding an exogenous return r^* and compare the expected returns of their investments with it. In addition, tradable-sector firms may also invest abroad in their own sector and therefore compare domestic and foreign sectoral profit rates. Firms in sector R compare r_R with r_R^*, while firms in sector M compare r_M with r_M^*.

In principle, firms could also reallocate investment across domestic sectors. In practice, however, fixed intangible capital, entry costs, and other frictions limit such reallocation in the short and medium run. While large corporations may diversify their productive portfolios for strategic reasons, these cases are abstracted from, as the focus is on short-to medium-run analysis.

Equations (17)–(19) present sectoral rates of profit.

$$r_R \equiv \frac{P_R Y_R}{P_M K_R} = \rho^* a_K \tag{17}$$

6 The literature on contractionary effects of devaluations in developing countries is extensive. Krugman and Taylor (1978) is another classic reference. Cespedes et al. (2004) accounts for more recent developments, including balance sheet effects and high capital mobility.

$$r_M \equiv \frac{P_M Y_M - W L_M}{P_M K_M} = \frac{1}{K_M}\left[F\left(L_M(q), K_M\right) - \frac{1}{q} L_M(q)\right] \tag{18}$$

$$r_N \equiv \frac{P_N Y_N - W L_N}{P_M K_N} = \frac{\mu}{K_M}\frac{L_N\left(q, \rho^*, L, \theta\right)}{q} \tag{19}$$

An improvement in ρ^* raises the rate of profit in sector R and an increase in q raises the rate of profit in M.

Given the mark-up (μ), profitability in sector N depends on capacity utilization, represented by sectoral employment, L_N that, in turn, is a function of L, θ, ρ^* and q. An increase in L or θ increases demand for non-tradables and consequently utilization capacity in sector N. An increase ρ^* reduces the purchasing power of workers' income, consumption demand for N and therefore the rate of profit. The effect of q on r_N is ambiguous: a higher q contracts the demand for N and also reduces the relative price of non-tradable firms' income relative to their capital stock, but its effect on total employment is itself ambiguous, as it reduces L_N but expands L_M. Under the assumption that devaluation is contractionary, r_N unambiguously falls.

Focusing exclusively on sector's own profit rate, investment demand in each sector is given by:

$$I_R = I_R\left(\rho^*, \theta, K_R\right) \quad I_{R\rho^*} > 0, I_{R\theta} > 0, I_{\mathrm{RK}_R} > 0 \tag{20}$$

$$I_M = I_M\left(q, \theta, K_M\right) \quad I_{Mq} > 0, I_{M\theta} > 0, I_{\mathrm{MK}_M} \lesseqgtr 0 \tag{21}$$

$$I_N = I_N\left(q, \rho^*, \theta, K_N\right) \quad I_{\mathrm{Nq}} \lesseqgtr 0, I_{N\rho^*} < 0, I_{N\theta} > 0, I_{\mathrm{NK}_N} \lesseqgtr 0 \tag{22}$$

Total investment (I) is the sum of the sectoral investment demand. Assuming that capital stocks of R and M are significantly larger than that of N, increases in q and in ρ^* raise total investment, consistent with empirical evidence.[7]

$$I = I\left(q, \rho^*, L, \theta\right) \quad I_q > 0, I_{\rho^*} > 0, I_L > 0, I_\theta > 0 \tag{23}$$

Finally, although investment decisions depend on *expected* rather than *current* profitability, *actual* profit rates are taken as relevant signals for expectation formation. Consistent with a behavioralist approach (Akerlof 2002), firms face uncertainty, information costs, and bounded rationality, and therefore rely on observed profitability as a guide. When profit rates are sufficiently stable and persistent, they shape expectations and induce investment. As a result, the sensitivity of investment to changes in profitability is not constant over time: the immediate response may be weak or nil, but strengthens as firms perceive higher profitability as persistent rather than transitory.

7 See, for instance, Razmi et al. (2012) and Libman et al. (2019), who find lagged positive effects of RER levels on investment.

2.7 The Balance of Payments

Equation (24) presents the balance of payments (B) expressed in M goods valued in foreign currency (i.e. deflated by P_M^*). To simplify the expression, the behavior of total employment is expressed as $L(\cdot) = L(q,\rho^*,\theta)$. The first two terms together constitute the current account and Z represents net capital inflows.

$$B = \rho^* \left[Y_R - C_R \left(q, \rho^*, L\left(\cdot\right), \theta \right) \right] + \left[F\left(L_M\left(q\right), K_M \right) - C_M \left(q, \rho^*, L\left(\cdot\right), \theta \right) - I\left(q, \rho^*, L\left(\cdot\right), \theta \right) \right] + Z \tag{24}$$

Net capital inflows Z are treated as exogenous. This reflects the focus of the analysis on the real side of the economy and the deliberate abstraction from financial-sector behavior. The assumption, however, is not unrealistic: empirical evidence shows that capital inflows to developing countries are largely driven by external factors (Calvo et al. 1996; Fratzscher 2012). The literature distinguishes between domestic "pull" factors – such as domestic interest rates, institutions, and political risk – and external "push" factors, among which global liquidity conditions play a dominant role. In particular, monetary policy in advanced economies, as reflected in interest rates set by central banks such as the Fed or the ECB, has been shown to be a key determinant of international liquidity and capital flows to developing countries (Miranda-Agrippino and Rey 2022).

The appendix formally analyses how changes in q, ρ^* and θ impact on the current account and the overall balance of payments. An increase in q affects B through four channels. It improves the balance of payments by (i) expanding output in sector M and (ii) reducing consumption demand for R and M through a contraction in workers' real income. It worsens the balance of payments by (iii) increasing investment demand. Finally, it has (iv) an indirect effect through total employment, which influences both consumption and investment. Under the assumption that devaluation is contractionary for employment in the short run, this indirect channel reinforces the improvement in the balance of payments – a result frequently observed in Latin America.

A rise in ρ^* also affects B through four channels. It improves the balance of payments by (i) generating a positive valuation effect on net exports in sector R, (ii) reducing consumption demand for R and M through lower workers' real income, and (iii) contracting consumption and investment via its negative effect on total employment. At the same time, it worsens the balance of payments by (iv) raising investment demand in sector R. It is reasonable to expect the first three effects to dominate, so that an improvement in the terms of trade leads to an overall improvement in the balance-of-payments outcome.

Finally, the effect of θ on B is unambiguously negative. An expansive macroeconomic policy increases consumption demand for R and M and also investment demand, thus worsening the balance of payments. This is the standard result of the absorption approach to the balance of payments.

2.8 Short-Run Equilibrium

The short run is defined as the period during which nominal wages, the mark-up, sectoral capital stocks, and technologies are fixed. Given the exogenous external variables ρ^* and Z, macroeconomic policy – conducted through θ and q – determines employment and the balance of payments. Accordingly, the short-run equilibrium value of total employment L is determined by equation (16) and, conditional on that, the equilibrium value of the balance of payments B is determined by (24).

It is useful to summarize the short-run workings of the model. To avoid aggregation problems, the framework does not feature a standard aggregate output variable Y. Instead, because labor is homogeneous, the indicator of economic activity is total employment L. Employment in price-taker sector M is supply-determined: firms choose labor demand based on relative prices and technology, while domestic demand for M goods is met at given international prices through imports or exports. By contrast, employment in the non-tradable sector N is demand-determined and depends on workers' consumption. Consequently, changes in income distribution affect short-run activity only through their impact on demand for non-tradable goods and services. Investment demand is directed toward tradable goods M and therefore does not directly affect employment in the short run, although it plays a role in determining the balance of payments.

As shown in Section 2.5, θ has a positive impact on total employment, while the effect of q is theoretically ambiguous. Following the traditional Latin American case, the paper assumes that real devaluation contracts employment in the short run, mainly through the fall in non-tradable employment.

An increase in ρ^*, *holding other variables constant*, reduces workers' purchasing power and, therefore, aggregate consumption, leading to a fall in employment in sector N and in total employment. This result may appear counterintuitive in the Latin American context, but it follows from the assumption that both q and θ are kept unchanged in the short run. Under a floating exchange-rate regime, however, a favorable terms-of-trade shock would typically induce a real appreciation, raising real wages, consumption, and employment. In addition, higher export prices usually improve fiscal revenues in resource-exporting economies, creating room for a more expansionary fiscal stance. In the model, this effect can be captured by an endogenous increase in θ. As a result, the overall effect of a terms-of-trade improvement on

employment can be expansionary, reflecting the joint impact of a lower q and a higher θ induced by the rise in ρ*. In sum, the model is able to capture three distinct channels through which an improvement in the terms of trade affects activity and employment in Latin American economies: it reduces workers' consumption – particularly in countries where export goods are food-related – , it tends to appreciate the currency, and it facilitates fiscal expansion.

As discussed in detail in Section 2.7, the balance of payments is determined by the combined effects of q, ρ^* and θ on production, consumption, and investment. An increase in θ unambiguously worsens the balance of payments through higher domestic absorption, while both a real depreciation and an improvement in the terms of trade are assumed to improve the balance-of-payments position. Finally, a surge in capital inflows (Z) relaxes the external constraint without adverse effects on employment, thereby creating room for a more expansionary macroeconomic stance. Such episodes often translate into higher θ, particularly when governments choose to take electoral advantage of favorable international liquidity conditions.

For completeness, the short-run comparative-static effects of changes in q, θ and ρ^* on employment and the balance of payments are formally derived in the Appendix.

3 The RER and its Three Key Levels

The real exchange rate is a relative price, but its formal definition depends on the structure of the model. In one-good open-economy models, it is defined as the relative price of the domestic good in terms of the foreign good (EP^*/P); the so-called *external* RER. In two-good models, it is defined as the domestic relative price between tradable and non-tradable goods (P_T/P_N), usually referred to as the *internal* RER.

In models with more than two goods, however, the definition is less straightforward. In our three-good framework, one could construct a composite tradable good combining sectors R and M and define the RER relative to the non-tradable good, following the standard dependent-economy approach (e.g. like the Dutch disease model of Corden and Neary 1982). Under this definition, however, the relative price of tradables becomes a function of the terms of trade, making it impossible to treat the real exchange rate and the terms of trade as two independent relative prices – an essential requirement for the purposes of this paper.

This requirement motivates the interpretation of $q \equiv E/W=(W/E)^{-1}$, introduced in Section 2.2, as the real exchange rate of the economy. This definition follows naturally from the price structure of the model. The nominal exchange rate E determines the domestic prices of tradable goods R and M through the law of one price, while the nominal wage W is the key determinant of non-tradable prices under mark-up

pricing in sector N. As a result, q captures the *internal* relative price of tradables to non-tradables independently of the terms of trade, playing the same analytical role as the standard P_T/P_N ratio in a two-good framework.

An alternative definition would be EW^*/W, where W^* denotes the foreign nominal wage. This would correspond to the standard *external* RER definition used in one-good open-economy models. This formulation would allow for foreign wage or cost shocks without altering the qualitative results of the model and is formally equivalent to the present definition under the normalization $W^* = 1$. The definition adopted here is chosen for simplicity and because it highlights the RER as the ratio of two prices determined domestically. Under this definition, an increase in q represents a real depreciation and implies a fall in the purchasing power of wages measured in foreign currency ($w_E \equiv W/E$).

I now turn to the characterization of the three key levels of q in the economy.

3.1 Macroeconomic Equilibrium RER

RER misalignment is frequently invoked in macroeconomic policy discussions and analyses. There are good theoretical reasons and empirical support showing that RER misalignment may lead to balance of payments crises, over-indebtness, and financial crises in developing countries. A misalignment is defined as a deviation of the RER from its *equilibrium* level. Because misalignments can be problematic, the identification of the equilibrium RER is relevant for macroeconomic policy.

Despite ongoing debates regarding its precise definition and empirical estimation, standard macroeconomic theory defines the *equilibrium* RER as the value consistent with the simultaneous achievement of internal and external balances, given other variables that may influence these objectives (Hinkle and Monteil 1999). Internal balance is typically associated with full employment, while external balance refers to a current account position compatible with a level of capital inflows that makes net international liabilities keep a sustainable path.

As in standard macroeconomic theory, equilibrium RER is one of the key levels in our framework. However, given the existence of another equilibrium level, this is referred to as the *macroeconomic equilibrium* RER and is denoted by q^E. Macroeconomic equilibrium is attained when internal and external balances hold simultaneously. Internal balance (IB) in our model corresponds to full employment, $L = \overline{L}$. External balance (EB) occurs when the current account evaluated with the *sustainable* value of the terms of trade ($\overline{\rho}^*$) is fully financed by *sustainable* net capital

inflows ($\overline{Z}$). Evaluating EB at sustainable external conditions rules out cases in which external equilibrium is temporarily achieved due to transitory trade or financial shocks.[8]

Because the model is static, it does not explicitly track the evolution of the economy's net international asset position. Accordingly, $\overline{Z}$ should be interpreted as the flow of foreign finance consistent with a stable long-run ratio of net external liabilities to GDP (or exports). In a small open economy, this sustainable level depends on the risk preferences of international investors and the long-run returns on alternative assets, which are treated as exogenous.

Formally, q^E is obtained by imposing full employment ($L = \overline{L}$), sustainable external conditions ($\rho^* = \overline{\rho}^*$ and $Z = \overline{Z}$) and balance-of-payments equilibrium ($B = 0$) in equations (16) and (24). The appendix derives q^E formally. Figure 1 presents a standard Salter-Swan diagram in the q-θ space, where q^E is determined by the intersection of IB and EB schedules. Panel (a) describes the case in which the effect of a real devaluation is expansionary and (b) when it is contractionary. Given the empirical relevance of the latter for Latin American economies, the analysis focuses on that configuration.[9]

As usual, the diagram can be divided into four quadrants: (1) external surplus with unemployment, (2) external surplus with inflationary pressures, (3) external deficit with unemployment and (4) external deficit with inflationary pressures.

As shown in the appendix, q^E is a function of predetermined variables such as a_K, K_R and K_M, and exogenous external variables such as $\overline{\rho}^*$ and $\overline{Z}$.

$$q^E = \mathrm{q_E}\left(a_K, K_R, K_M, \overline{\rho}^*, \overline{Z}\right) \tag{25}$$

8 The empirical estimation of $\overline{\rho}^*$ and $\overline{Z}$ is far from trivial. Because the ability to derive long-term sustainable values from forward-looking analyses is challenging in practice, some analysts instead use the label *normal* or *historical*, especially when time series appear to be stationary. Thus, $\overline{\rho}^*$ and $\overline{Z}$ can alternatively be seen as the normal or historical values of the terms of trade and net capital inflows.

9 While alternative relative-slope configurations of the internal- and external-balance schedules are formally possible in the (q,θ) plane, the configuration illustrated in panel (b) of Figure 1 corresponds to the empirically relevant case for the Latin American economies emphasized in the paper. In particular, under a contractionary-devaluation regime ($L_q < 0$), a real depreciation tends to improve the balance of payments, making the EB schedule upward sloping but relatively flat due to the endogenous employment channel (see the appendix). Configurations in which the IB is locally flatter than the EB would require parameter constellations implying either a weak employment response to demand changes and/or an unusually strong deterioration of the balance of payments following an expansion in aggregate demand, which are unlikely to be representative of the economies under consideration.

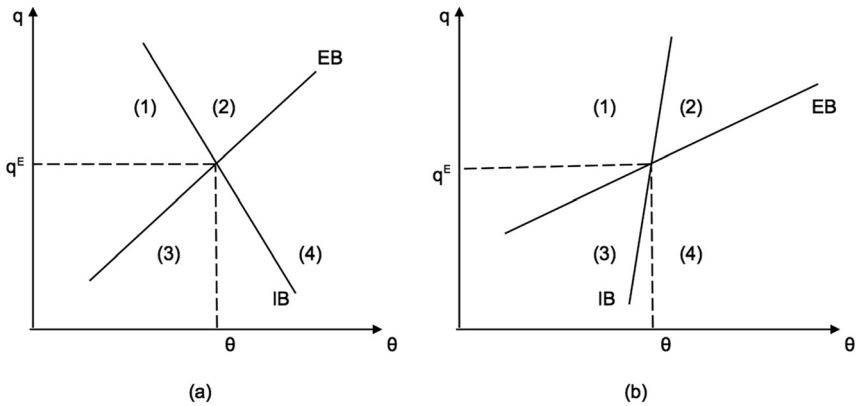

Figure 1: Internal and external balance.

Any sustainable increase (decrease) in the flow of foreign exchange to the economy leads to an equilibrium real appreciation (depreciation). A sustainable increase in capital stocks in sectors R and M expands domestic tradable output inducing an equilibrium real appreciation ($dq^{E}/dK_R < 0$ and $dq^{E}/dK_M < 0$). The same occurs with an increase of the output-capital ratio in sector R ($dq^{E}/da_K<0$). Sustainable increases in the terms of trade and in net capital inflows also generate an equilibrium appreciation ($dq^{E}/d\overline{\rho}^{*} < 0$ and $dq^{E}/d\overline{Z} < 0$). The appendix presents a formal derivation of these results, which are in line with the standard literature (Hinkle and Monteil 1999). It is worth noting that because all the determinants are given in the short run – both the predetermined and exogenous variables – the macroeconomic equilibrium RER is also given in the short run.

3.2 Social Equilibrium RER

General equilibrium in our framework requires another equilibrium condition*:* *social equilibrium*. Common sources of social discontent and conflict are unemployment and widespread perceptions of unfair income distribution. Social equilibrium can be defined as a state in which workers are fully employed and successfully bargain a wage rate that satisfies their income aspirations, represented by a bundle of goods ω^{S}.

Given the requirement of full employment, social equilibrium can only occur at internal balance. In other words, internal balance is a necessary but not sufficient condition for social equilibrium. Only when the full-employment level of the *real*

wage is at least equal to ω^S, social equilibrium is attained. In that case, the bargained nominal wage rate equals or exceeds the money value of workers' desired bundle.

$$W \geq P\omega^S \tag{26}$$

with $P \equiv P_R^{\alpha} P_M^{\beta} P_N^{1-\alpha-\beta}$, where α and β denote the expenditure shares of R and M goods in the aggregate price index. [10] Imposing equality in (26) and solving for q, we obtain the level of the RER consistent with a real wage whose purchasing power equals ω^S. This level is the *social equilibrium RER*, denoted by q^S:

$$q^s = qs(\omega^s, \rho^*) = \delta(\omega^s)^{-\frac{1}{\alpha+\beta}}(\rho^*)^{-\frac{\alpha}{\alpha+\beta}} \tag{27}$$

where $\delta = \left(\frac{y_N}{1+\mu}\right)^{\frac{1-\alpha-\beta}{\alpha+\beta}}$ is assumed constant during the analysis.

An increase in workers' aspirations or the terms of trade raises the money value of ω^S. To afford it, workers need an increase in W relative to E, which implies a decrease in q^S (i.e. $dq^S/d\omega^S<0$ and $dq^S/d\rho^*<0$).

Figure 2 shows that social equilibrium lies along the bold segment of the internal balance locus below q^S. A downward movement along the IB curve implies that full employment is achieved with an increase in the purchasing power of wages in terms of tradable goods R and M.

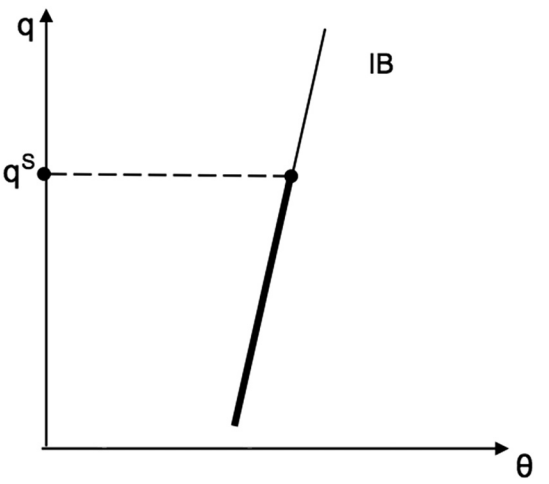

Figure 2: Social equilibrium in the q-θ plane.

10 Consumer price indexes are normally constructed as arithmetic weighted averages of the Laspeyres type. The assumption of a geometric weighted-average price index is purely to make the formal derivation simpler.

It is worth noting that ω^S is not the Walrasian real wage that clears the labor market. As Figure 2 suggests, there are several values of the RER and consequently of the real wage that ensure full employment but not social equilibrium. Our framework shares with several models the view that the wage rate is not a market-clearing variable. These alternative approaches emphasize that wages are determined not only by the conditions in the labor market, but also by social norms and institutions. This view is shared by real-wage resistance models (Cardoso 1981), efficiency-wage models (Akerlof and Yellen 1986), bargaining models (Oswald 1986), and conflict models (Rowthorn 1977). The term *social equilibrium* follows Olivera (1991), who defines it as a real wage consistent with workers' aspirations such as ω^S.

The social norms and institutions underlying ω^S are historical constructs that evolve gradually over time. Because of this, ω^S should be considered as a state variable that is given in the short run. Accordingly, q^S is also predetermined in the short run, except for transitory shocks to the international terms of trade.

3.3 Developmental RER

The RER is a key determinant of profitability in a labor-absorbing tradable sector like M. Since capital accumulation depends on profitability, the RER influences the long-run size of this sector and the economy's productive structure. Equations (20)–(22) describe investment behavior across sectors and show that higher values of q increase investment in sector M relative to the other sectors.

What level of q is consistent with sustained capital accumulation in M? To address this question, we adopt the simplifying assumption that domestic and foreign technologies in sector M are similar, implying comparable capital–output ratios. Under this assumption, parity between domestic and foreign profit rates in sector M ($r_M = r_M^*$) requires that the domestic wage rate measured in foreign currency ($w_E \equiv W/E$) equal the foreign wage rate adjusted by relative labor productivity:

$$w_E = \tilde{w}_E \equiv \frac{y_M}{y_M^*} W^* \tag{28}$$

where $W^*$is the foreign wage rate (in foreign currency) and y_M and y_M^* are the domestic and foreign labor productivities in sector M. Because it is adjusted by relative productivity, $\tilde{w}_E$ can be interpreted as the Balassa-Samuelson-adjusted wage rate for sector M. Because of the inverse relationship between q and w_E, we can define $\tilde{q} \equiv \tilde{w}_E^{-1}$ as the Balassa-Samuelson-adjusted RER of sector M.

Meeting condition (28) is likely insufficient to foster capital accumulation in labor-absorbing tradable sectors in developing countries. Adequate investment incentives require a lower wage rate, $w_E < \tilde{w}_E$. First, firm-level productivity is affected

by economy-wide factors – such as deficient infrastructure, public services and institutions – that typically disadvantage developing countries. Second, even after accounting for these factors, profitability must usually include a risk premium reflecting political and exchange-rate risks.

Considering all these elements, the *adjusted* parity condition becomes:

$$w_E = \gamma \tilde{w}_E \quad 0 < \gamma < 1 \tag{29}$$

where γ captures both the risk premium and the total factor productivity disadvantages. Expressed in terms of the RER, this condition defines the *developmental* RER, denoted by q^D. This level of q ensures a sufficiently attractive profit rate for sustained capital accumulation in sector M. Since $0 < \gamma < 1$, the developmental RER exceeds the Balassa–Samuelson–adjusted RER: [11]

$$q^D = \mathrm{q_D}\left(y^*_M / y_M, W^*, \gamma\right) = \frac{1}{\gamma}\tilde{q} \tag{30}$$

The term *developmental* is due to a long-standing tradition in development economics that links economic development to capital accumulation in labor-absorbing tradable activities.

Several closely related concepts appear in the Latin American literature. Building on Williamson's (2003) "development approach" to exchange rate policy, Frenkel (2004) introduced the notion of a *stable and competitive real exchange rate*, albeit without providing an explicit formal definition. Bresser Pereira (2010) defined the *industrial equilibrium real exchange rate* as the level that makes industrial firms using state-of-the-art technology competitive in world markets. Unlike that definition, q^D applies to the broader sector M, which includes not only manufacturing but also modern tradable services and natural-resource–based manufactures. Other authors, such as Cimoli, Dosi, and Stiglitz (2009) and Cimoli, Pereima and Porcile (2019), also stress the need for competitive RERs but emphasize that price competitiveness must be complemented by non-price factors – technological capabilities, learning dynamics, and industrial and technological policies.

As with the other two key levels of the RER, the determinants of q^D are slowly evolving state variables or exogenous external factors. Accordingly, q^D – like the other benchmark RER levels in the framework – can be treated as given in the short run. The paper focuses on the characterization of these benchmark RER levels and

11 The assumption that domestic firms operate with state-of-the-art technology comparable to firms in developed economies may indeed be too strong and, in many cases, unrealistic. Yet the key point is that even with such technology, firms in the M sector would still require a sufficiently high RER to obtain an investment-inducing rate of return. Naturally, productivity gaps would only amplify this requirement.

does not model the evolution of their underlying determinants over time, which is beyond its scope.

4 The Three Levels of the RER in the Latin American Context

Equations (25), (27), and (30) define the three key levels of the RER and their determinants. These levels are independent of each other and may not coincide. They are determined by variables that are largely given in the short run. In other words, q^E, q^S and q^D can be conceived as benchmarks shaped by country-specific structural features – both economic (e.g. K_R, K_M and y_M) and social (e.g. ω^S) – as well as exogenous external factors (e.g. $\overline{p}^*$, $\overline{Z}$ and y_M^*). The resulting configurations of these three levels vary across countries and may be relevant for macroeconomic policy.

4.1 Two Frequent Configurations: $q^E < q^D$ and $q^E > q^S$

The three-RER-levels framework can be used to characterize several theories that have been developed in Latin America. Two configurations are particularly relevant. When $q^E < q^D$, incentives for capital accumulation are weak and, as a result, sector M may be underdeveloped. When $q^E > q^S$, the economy may be unstable, oscillating between macroeconomic and social equilibrium.

4.1.1 Unbalanced Economic Structure: $q^E < q^D$

Because they are net exporters of R and net importers of M, the configuration $q^E < q^D$ is very likely in many Latin American countries. This is easy to see. Suppose, for instance, that domestic production of R disappears ($K_R = 0$). Macroeconomic equilibrium would require a substantial real depreciation (i.e. $\uparrow q^E$). Consequently, the higher the contribution of sector R to the flow of foreign exchange, the more likely that $q^E < q^D$.

Panel (a) of Figure 3 depicts this configuration, which can be called an *unbalanced productive structure* (UPS), a term introduced by Diamand (1977) to describe economies in which the primary sector exhibits higher productivity than the industrial sector. The UPS case is closely related to the Dutch disease. The latter is the case in which a favorable external shock – e.g., a discovery of oil fields or minerals

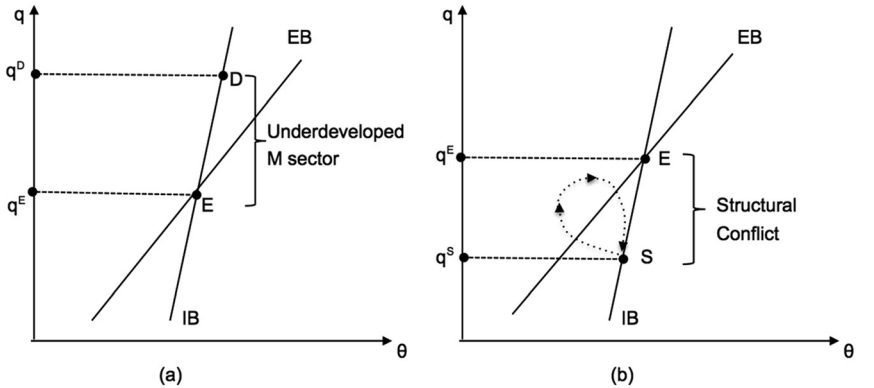

Figure 3: Two frequent configurations.

like gold, copper or lithium (an increase in a_K) – generates an equilibrium appreciation of the domestic currency (a fall in q_E).[12] In Figure 3 (a), the Dutch disease appears as a Southeast shift of the EB schedule, moving the economy from a point such as D to one like E. Economies with an UPS can therefore be seen as having been "born" with Dutch disease, resulting in an underdeveloped M sector.

An UPS could engender an underdevelopment trap if sector M is key for economic development. This is essentially the same argument that relates the Dutch disease with the *natural resource curse*: if the non-booming sector operates under some sort of increasing returns to scale, then a change in the economic structure due to the positive external shock in R is growth-reducing (Sachs and Warner 2001).

Several authors have identified the UPS case as a serious constraint to economic development in Latin America. During his stay at ECLAC, Kaldor (1964) realized that as a result of the primary sector being a net exporter, the RER tended to be below the level required for industrialization. To offset this asymmetry, he advocated multiple exchange rates, allowing industrial activities to face a higher effective exchange rate – closer to q^D, in our framework. Diamand (1977) made similar proposals to overcome the UPS problem. More recently, Bresser Pereira (2010) has argued that this structural characteristic could take Brazil and other Latin American countries to a Dutch disease-type syndrome, generated by a 'current' RER below the 'industrial equilibrium' RER level (or, in our framework, $q^E < q^D$) and, as a result, a tendency towards deindustrialization. Frenkel (2004) and Frenkel and Taylor (2006) made similar arguments.

12 A similar case can be a sustained increase in the international terms of trade, $\overline{p}^*$.

4.1.2 Structural Distributive Conflict: $q^E > q^S$

Another configuration frequently observed in Latin America is $q^E > q^S$. In this case, social equilibrium leads to an unsustainable trajectory of the balance of payments, while macroeconomic equilibrium results in social discontent. Panel (b) in Figure 3 illustrates this case.

At a point like S, domestic spending on tradables exceeds domestic tradable production, and the resulting current account deficit cannot be financed through long-term capital inflows. Social equilibrium may be maintained in the short run through temporary high terms of trade and/or access to finance (i.e. $\rho^* > \overline{\rho}^*$ and/or $Z > \overline{Z}$). However, since the balance of payments follows an unsustainable path, a devaluation will eventually shrink workers' income and employment.

Macroeconomic policies that lead to domestic overspending and RER overvaluation ($q < q^E$) have sometimes been labeled as '*macroeconomic populism*'. This term has been used to describe short-sighted macroeconomic strategies that seek to improve income distribution but end up producing unsustainable demand for tradables and balance-of-payments crises. This narrative has been applied to several episodes in Latin America during the 1970s and 1980s (Dornbusch and Edwards 1989).

The 'macroeconomic populism' story resembles the $q^E > q^S$ configuration, but an important distinction must be made. Since q^E is determined by $a_K, K_R, K_M, \overline{\rho}^*$ and $\overline{Z}$, and q^S largely by ω^S – all of which are state variables that change gradually over time – the discrepancy between q^E and q^S is not a transitory disequilibrium led by macroeconomic policy but a structural one. Behind $q^E > q^S$ lies a collision between, on the one hand, income aspirations rooted in social norms derived from history and tradition, and on the other hand, income possibilities supported by the capital stock and productivity in the tradable sectors. This is a collision between social and economic structures, or what Gerchunoff and Rapetti (2016) term a *structural distributive conflict* (SDC).

SDC is a specific case of a broader class of structural disequilibria, in which the system's equilibrium is indeterminate (Basu 2003, ch. 4). A less progressive income distribution could reduce spending on tradables and restore internal and external balance, but such an outcome would violate prevailing social norms. Alternatively, expanding tradable capacity could sustain the desired income distribution, but this would require a substantial increase in tradable capital stock and productivity. Achieving this would demand sustained incentives for capital accumulation over time – in the form of higher r_R and r_M, and thus lower real wages – but such a policy may conflict with social aspirations. What may superficially appear as short-term *populism* can, in fact, be a deeper structural conflict (Gerchunoff et al. 2020).

This configuration underlies several Latin American models of stop-and-go cycles and inflation. Braun and Joy (1968) were among the first to formally analyze cyclical dynamics driven by unsustainable trade deficits once full employment is reached – stemming, in our framework, from high demand for M-sector goods.[13] Structuralist models of inflation emphasize sectoral bottlenecks that generate relative price changes as the economy moves towards full employment. Signs of excess demand tend to appear in food or foreign-exchange markets before they do in the labor market; thus, inflationary pressures are combined with falling real wages, below workers' aspirations. Distributional conflict, combined with accommodative monetary policy and indexation, then results in persistent inflation. The body of work within this tradition in Latin America is extensive.[14]

4.2 Three Development Strategies in the Latin American Debate

Our framework also helps organize more recent debates on development strategies in Latin America. With some flexibility, three broad strategies can be identified, each associated with one of the three benchmark RER levels. One strategy can be labeled *developmentalist*. It rests on the idea that economic development depends on the sustained expansion of a specific sector with three key features: i) it is tradable, ii) labor-absorbing, and iii) operates under some form of increasing returns. The latter implies that its expansion – through positive externalities or productivity gains relative to other sectors – raises GDP per capita. In the terminology of early development theory, this is a '*modern*' tradable sector.

In terms of our framework, this sector can be associated with M. Under additional assumptions or modifications regarding technologies and capital accumulation dynamics that lie beyond the model's short-run horizon, reallocating resources from N to M would increase aggregate labor productivity. As discussed above, the RER plays a central role in shaping profitability in tradable activities and, in that sense, influences incentives for capital accumulation and the relative size of this sector over time. In economies with an unbalanced productive structure, this sector tends to remain underdeveloped unless state intervention raises its relative profitability. Industrial policy can thus be interpreted as a set of interventions aimed at increasing the profitability of strategic sectors that are not profitable at prevailing

13 Other contributions are, for example, Taylor (1974) and Porto (1975).

14 Besides the pioneering work of Sunkel (1958) and Olivera (1964), see also Lara Resende (1979), Cardoso (1981), Heymann and Navajas (1989), Olivera (1991) and Taylor (1991), among others. For a thorough survey, see Vera (2013).

'*equilibrium*' market prices. In Amsden's (1989) words, economic policy should aim at '*getting prices wrong*'

From this perspective, a macroeconomic policy targeting a RER level such as q^D can be understood as a specific form of industrial policy. Since the rate of profit in sector M is an increasing function of the real exchange rate, targeting q^D implies a higher profit rate than targeting a RER like q^E, provided that $q^E < q^D$. In addition, such a policy tends to weaken incentives to accumulate capital in the non-tradable sector, thereby encouraging a reallocation of resources toward manufacturing and tradable services.

Like any instrument of industrial policy, targeting RER undervaluation – i.e.,- setting the RER above its macroeconomic equilibrium level – has advantages and disadvantages. As a horizontal policy, it does not demand gathering and processing information to pick winners and it avoids corruption and rent-seeking. Its main disadvantage is that it is costly and regressive: the resources transferred to sector M – equal to $(q^D–q^E)L$ – come from workers, who earn lower real wages than under macroeconomic equilibrium.

Advocates of the developmentalist strategy also emphasize macroprudential considerations. They argue that reliance on external finance is risky for emerging market economies due to imperfections in global financial markets, which make them vulnerable to sudden stops and crises driven by volatile capital flows. An undervalued RER – i.e., a level higher than q^E, like q^D – is associated with lower foreign savings – that is, smaller current account deficits or larger surpluses – facilitating reserve accumulation and reducing exposure to balance-of-payments and financial crises. A substantial empirical literature documents a positive association between RER undervaluation, reserve accumulation, and stronger external positions, all of which tend to be correlated with faster growth in emerging economies.[15]

A more conventional view holds that the best macroeconomic strategy to promote development is to ensure macroeconomic stability. This involves prudent fiscal policy to avoid unsustainable public debt, inflation targeting to achieve both internal and external balance and free capital mobility. The exchange rate should float around its macroeconomic equilibrium level, with foreign-exchange intervention limited to macroprudential purposes aimed at preventing excessive misalignment or volatility (Ghosh et al. 2017). In terms of our framework, this strategy corresponds to a point such as E in Figure 4.

Rooted in Walrasian general equilibrium theory, this view holds that both RER undervaluation and overvaluation generate relative-price distortions that

15 A large number of empirical studies have shown that undervalued RERs are associated with faster growth in developing countries. See Rapetti (2020) and Demir and Razmi (2022) for recent surveys of this literature.

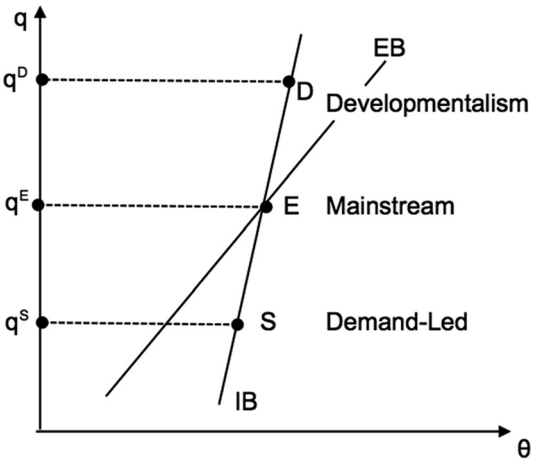

Figure 4: Development strategies in Latin America.

misallocate resources and ultimately hinder long-run growth (Miao and Berg 2010). Persistent overvaluation leads to excessive external debt and balance-of-payments crises, while sustained undervaluation results in excessive foreign asset accumulation, potential inflationary pressures, sterilization costs, or quasi-fiscal problems.

A third view conceives economic development as a demand-driven process in which macroeconomic policy can foster growth by stimulating domestic demand. Fiscal and monetary policies should therefore have an expansionary bias. However, since these policies are also needed to manage the business cycle, a sustainable demand stimulus can be carried out through policies promoting higher wages, making growth wage-led. A RER appreciation redistributes income toward labor and therefore increases workers' income and consumption. Under this view, RER appreciation is seen not only as growth-enhancing, but also as socially cohesive, insofar as it reduces distributional conflict and promotes social harmony. Although often presented in one-sector models, this strategy can be represented in our framework as targeting a point such as S in Figure 4.

According to our framework, however, a state like S is unsustainable over time, as it generates an explosive trajectory of external debt. Proponents of the demand-led strategy argue otherwise, claiming that RER overvaluation is transitory. Through the so-called Kaldor–Verdoorn mechanism, faster GDP growth induced by demand expansion raises productivity, gradually improving the balance of payments and leading to an equilibrium RER appreciation. As this process unfolds, the EB curve shifts southeast, eventually transforming S into a macroeconomic equilibrium (S = E).

5 Concluding Remarks

This article presents a static three-sector open-economy model designed to capture key structural features typical of many Latin American economies. An important contribution of the model is that it allows for the identification and precise characterization of three key levels of the real exchange rate that influence the behavior of Latin American economies: the *macroeconomic equilibrium* RER, the *social equilibrium* RER, and the *developmental* RER. These levels are very useful for understanding the dynamics of balance of payments, employment, inflation, and business cycles in the region.

The three-RER-levels framework helps characterize important theories that have been introduced by previous relevant contributions in the region – like stop-and-go cycles, structural inflation, macroeconomic populism, secular tendency to RER overvaluation, distributive conflict and underdevelopment traps due to unbalanced productive structure – within a unified theoretical framework. It also offers a common analytical language for framing the debate over alternative development strategies in the region, ranging from macroeconomic stability–oriented approaches to competitive-RER and demand-led strategies.

Appendix

Total Employment

Total employment is the sum of employment in sector M L_M and in non-tradables $L_N = \frac{1}{y_N} C_N(q, \rho^*, L, \theta)$. Assuming that both L_M and C_N are continuous and differentiable functions, we can write the total employment function in implicit form (ignoring labor productivity in the non-tradable-sector):

$$f(\mathrm{L}, q, \rho^*, \theta) = 0 \text{ with } f_L < 0 f_q \lesseqgtr 0, f_{\rho^*} < 0, \text{and } f_\theta > 0 \tag{A3}$$

Since the Jacobian of L with respect to the arguments is invertible ($f_L \neq 0$), we can use the implicit function theorem to obtain the partial effects. Total differentiation of (A3), given that $L'_{M,q} > 0$, $C'_{NL} > 0$, $C'_{N\theta} > 0$, $C'_{N,q} < 0$ and $C'_{N\rho^*} < 0$, yields:

$$\frac{dL}{dq} = -\frac{f_q}{f_L} \lesseqgtr 0$$

$$\frac{dL}{d\rho^*} = -\frac{f_{\rho^*}}{f_L} < 0$$

$$\frac{dL}{d\theta} = -\frac{f_\theta}{f_L} > 0$$

The sign of $\frac{dL}{dq}$ depends on strength of the positive effect of the real exchange rate on sector M's employment $L'_{M,q} > 0$ vis-à-vis its negative effect on non-tradable consumption $C'_{N,q} < 0$ (which in turn determines employment in that sector). This explains equation (16) in the text.

Investment Behavior

The rate of growth of the capital stock of the i-th sector is defined by $g_i = \frac{I_i}{K_i}$.

The sectoral rate of investment is a function of the sectoral profit rate and the policy variable. Thus, the investment functions are.

$$I_R = K_R g_R(r_R, \theta) \tag{B1}$$

$$I_M = K_M g_M(r_M, \theta) \tag{B2}$$

$$I_N = K_N g_N(r_N, \theta) \tag{B3}$$

Using the expressions for the sectoral rates of profits yields the equations in the text. Notice that, except for the sector R, where the capital stock is proportional to output, the effect of the capital stock on investment is ambiguous. A higher capital stock induces additional investment (via the scale effects), but it also reduces the profit rate and the incentive to accumulate additional capital.

The Balance of Payments

Assuming that all components of the balance of payments are continuous and differentiable, total differentiation of (24) yields:

$$\frac{dB}{dq} = F'L_{M,q} - (\rho^* C_{R,q} + C_{M,q}) - I_q - (\rho^* C_{R,L} + C_{M,L} + I_L)L_q \lesseqgtr 0 \tag{C1}$$

$$\frac{dB}{d\rho^*} = [Y_R - C_R(q, \rho^*, L, \theta)] - (\rho^* C_{R,\rho^*} + C_{M,\rho^*}) - (\rho^* C_{R,L} + C_{M,L} + I_L)L_{\rho^*} - I_{\rho^*} \lesseqgtr 0 \tag{C2}$$

$$\frac{dB}{d\theta} = -(\rho^* C_{R,\theta} + C_{M,\theta}) - (\rho^* C_{R,L} + C_{M,L} + I_L)L_\theta - I_\theta < 0 \tag{C3}$$

The signs of C1 and C2 are ambiguous. In the case of C1, it primarily depends on whether the effect of real devaluation on total employment is expansionary ($L_q > 0$) or contractionary ($L_q < 0$). As discussed in the main text, the usual case in Latin America has been contractionary, thus making devaluation improve the balance of payments. In the case of C2, the only effect that could worsen the balance of payments when ρ^* rises is the increase in investment demand in sector R. As mentioned in the text, it would be unrealistic to expect this effect to surpass the other three; thus, we anticipate that an improvement in the terms of trade will also improve the balance of payments outcome.

Macroeconomic Equilibrium RER

To obtain equation (25), take the balance of payments and, assuming full employment and the sustainable levels of capital flows and the terms of trade ($L = \overline{L}$, Z = $\overline{Z}$, and $\rho^* = \overline{\rho}^*$) set $B = 0$.

The result implies an implicit function of the form.

$$h\left(q, a_K, K_R, K_M, \overline{\rho}^*, \overline{Z}, \theta, \overline{L}\right) = 0$$

$$\text{with } h_q \lesseqgtr 0, h_{a_K} > 0, h_{K_R} > 0, h_{K_M} > 0, h_{\overline{\rho}^*} > 0, h_{\overline{Z}} > 0, h_\theta < 0 \text{ and } h_{\overline{L}} < 0 \qquad \text{(D1)}$$

The Jacobian of q with respect to the arguments is invertible ($h_q \neq 0$). We can therefore use the implicit function theorem to obtain the partial effects. Provided that $h_q > 0$ (which implies that a higher level of the real exchange rate improves the balance of payments), total differentiation of (D1) yields:

$$\frac{dq^E}{da_K} = -\frac{h_{a_K}}{h_q} < 0$$

$$\frac{dq^E}{dK_R} = -\frac{h_{K_R}}{h_q} < 0$$

$$\frac{dq^E}{dK_M} = -\frac{h_{K_M}}{h_q} < 0$$

$$\frac{dq^E}{d\overline{Z}} = -\frac{h_{\overline{Z}}}{h_q} < 0$$

$$\frac{dq^E}{d\overline{\rho}^*} = -\frac{h_{\overline{\rho}^*}}{h_q} < 0$$

$$\frac{dq^E}{d\theta} = -\frac{h_\theta}{h_q} > 0$$

$$\frac{dq^E}{d\bar{L}} = -\frac{h_{\bar{L}}}{h_q} > 0$$

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