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Real exchange rates and the long-run effects of aggregate demand in economies with underemployment

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Real exchange rates and the long-run effects of aggregate demand in economies with underemployment[1]

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Abstract

Successful economic development to a large extent derives from the mobilization of underemployed resources. Demand policy can play an important role. It is critical, however, to consider balance of payments constraints and to ensure an expansion of investment in the modern sector. A combination of investment promotion and exchange rate intervention may be required to achieve these goals.

JEL codes: F43, O11, O41

Key words: exchange rate, balance of payments, economic growth, inflation, aggregate demand, two-sector model

1 Introduction

Massive underemployment characterizes most developing countries, giving governments a strong temptation to adopt expansionary fiscal and monetary policies. In addition to any direct popularity effect of the specific measures, these policies boost employment and growth in the short run. But the boom may be short-lived and followed by economic crisis; Latin America offers numerous examples of this pattern. These

examples carry important lessons: aggregate demand is important, but the mobilization of underemployed resources must take into account balance of payments constraints and ensure an expansion of investment in the modern sector. A combination of investment promotion and exchange rate intervention may be needed to achieve these goals

Section 2 discusses the recent literature on the real exchange rate (RER) and the channels through which it may affect economic development. The channels are not necessarily mutually exclusive, but to keep the formal argument in section 3 as simple as possible, we leave out external increasing returns and other imperfections that may produce a link between the RER and economic growth. Our focus is on aggregate demand and the balance-of-payments. Section 4 uses Latin American episodes of growth and crisis to illustrate the theoretical argument. Section 5 concludes.

2 Channels

As pointed out by Eichengreen (2007), the recent literature has devoted substantially more effort to documenting the positive association between RER levels and economic growth than to understanding the channels through which the relationship between these two variables operates. In principle, an acceleration of per capita growth can come from an increase in capital accumulation or productivity growth. Following Montiel and Serven (2009), we call the former the ‘capital accumulation channel’ and the latter the ‘productivity channel’. Explanations within the productivity channel typically rely on some source of increasing returns to scale; within the other group, we find two types of

explanations: the ‘saving channel’ and the ‘external relaxation channel’. There is, finally, an explanation that emphasizes how RER overvaluation may lead to external and banking crises. Figure 1 presents a diagrammatic view of these potential channels linking the RER and economic growth and development.

Figure 1: Channels linking RER levels and economic growth

Rodrik (2008) provides an influential explanation emphasizing the productivity channel. Tradable activities, according to Rodrik, are affected disproportionally 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; an undervalued RER can be a second-best policy that compensates for the market and institutional failures, improves tradable profitability, and accelerates economic growth.

Rodrik is not the first to emphasize the importance of market failures in constraining economic development. These failures have been at the core of development economics since its early steps (Ros, 2001), and the interplay between trade, exchange rates and economic growth has been explored in many development theories. Learning externalities, for instance, imply that infant industries can benefit from temporary protection against foreign competition. Similarly, transitory RER overvaluation can lead to de-industrialization -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). Finally, models of export-led growth have emphasized positive

externalities that are not equally prevalent in non-export activities; policies reallocating resources to export industries therefore promote higher growth in these models (e.g. Feder,1983, and de Melo, 1992).[5]

Our model in section 3 disregards these various externalities and imperfections; not because they may not be important but in order to bring out more clearly the factors associated with the other two channels.

A standard explanation within the capital accumulation channel suggests that RER undervaluation increases the saving rates which, in turn, translates into faster capital accumulation. Neither the empirical evidence reported nor the theoretical argument advanced for the saving channel is entirely compelling. On the empirical front, Montiel and Serven (2009) carry out a simple correlation analysis between RER levels and saving rates, using a pool of 94 countries over 1975-2005. Controlling for the level of income per capita to capture the Balassa-Samuelson effect, they find a positive correlation. The correlation, however, is weak and statistically significant only for the 10-year frequency data. The theoretical accounts of the "saving channel" have also been challenged by Montiel and Serven (2009). A rise in the equilibrium value of the RER, they argue, typically leads to a permanent increase in income and consumption, leaving the saving rate unchanged.

Unlike Montiel and Serven, Levy-Yeyati and Sturzengger (2009) relate the saving effects to distributional changes. A transition to a more competitive RER typically

reduces real wages and transfers income from workers to firms. Following the seminal contribution by Diaz-Alejandro (1963), if workers have a greater propensity to spend than firms, this redistribution increases the saving rate. It is not clear, however, that the redistribution must raise accumulation. As the original analysis of Díaz-Alejandro shows, a RER devaluation leading to higher saving can be contractionary.[6] Putting it differently, the saving-based argument treats capital accumulation as synonymous with saving. Our argument in section 3, by contrast, does not see growth as resource-constrained in this sense. Underemployed resources need to be mobilized; their mobilization and the rise in investment will be associated with an increase in saving, but the saving *rate* need not increase.

The other strand of the accumulation channel focuses on the balance of payments. In the early 1960s development economists noticed that growth in developing countries could suffer because of a lack of foreign exchange (e.g. Chenery and Bruno 1962). The argument, which was formalized in 'two-gap' models, assumes that capital accumulation requires foreign intermediate and capital goods, that these foreign goods are hard to substitute with domestic production, and that exports are insensitive to RER variations ('elasticity pessimism').

The two-gap argument has been challenged on two grounds. Capital mobility, first, can eliminate the external gap. If an economy needs to import capital goods and the value of its exports is insufficient to pay for them, the country can borrow from international capital markets and repay the debt when the accumulation of capital has increased the

export capacity (McKinnon, 1973). This argument is not convincing, however. Despite the financial globalization since the mid 1970s, developing countries' access to foreign finance is not nearly as smooth as the criticism suggests. The multiple imperfections that affect international financial markets make capital flows to developing countries limited and highly volatile, pushed by external factors (Calvo et al., 1993) and prone to contagion, herd behavior and sudden stops (Calvo, 1998). Simply opening the capital account therefore is not an effective antidote for foreign exchange problems in developing countries.

Second, even if price elasticities are low in the short run, the trade balance may react strongly to persistent changes in relative prices (Findlay, 1971). Indeed, it has been argued that growth in small open economies cannot be constrained by foreign exchange bottlenecks (Desai and Bhagwati, 1979). As shown by the analysis in section 3, however, ‘elasticity optimism’ does not eliminate the balance of payments constraint. In the short run, resources are given, the supply elasticity of export and import-substituting activities is low, and an acceleration of growth may require a more competitive exchange rate to reduce the domestic consumption of the tradable goods. Evidence suggests that exchange rates often fail to adjust in the face of external imbalances (Chinn, 2008). Thus, the adjustment does not happen automatically, and policy intervention may be needed to maintain a stable and competitive RER. Our model in section 3, which draws on Razmi et al. (2012), incorporates this "external relaxation channel.[7] Porcile and Lima (2009) adopt a similar perspective. In their model a high RER relaxes the external constraint and an elastic labor supply allows the

economy to incorporate workers into the modern sector with moderate impact on wage inflation.

The last main channel in figure 1 suggests that RER overvaluation causes external crises with long-lasting negative impacts on growth. There is evidence of this kind of association in a number of developing countries, notably Latin America. We discuss this channel more fully in section 4.

3 Model

3.1 A one-sector benchmark

The purpose of this paper is to analyze the role of aggregate demand and the real exchange rate in a multi-sector, open-economy setting. It may be useful, however, to approach this issue in a roundabout way, starting from models that are very well-known.

Consider a closed, one-sector economy. Assume, for simplicity, that output is produced using a fixed coefficient production function:

$$Y = \min\{\lambda L, \sigma K\} = \min\{L, K\} \tag{1}$$

where, using standard notation, Y, K and L denote output, capital and labor; λ and σ denote the maximum output-labor and output-capital ratios. Choosing suitable units and disregarding technical change, these parameters can be normalized to one; $\lambda = \sigma = 1$.

The utilization rate may fluctuate but the long-run average rate will not deviate (significantly and persistently) from the desired rate.[8] Thus, the equilibrium condition for the product market requires that

$$g + \delta = \frac{S}{K} = s\bar{u} \tag{2}$$

where g, δ and $\bar{u}$ are the growth rate of output (= the net accumulation rate when Y/K is constant), the depreciation rate and the desired utilization rate; s is the average saving rate.

Equation (2) determines a unique warranted growth rate in a simple Harrodian specification with a constant saving rate. We take a different approach. Both theory and evidence suggests that the saving rate is an increasing function of the profit share, π ,[9]

$$s = s(\pi); \quad s' > 0 \tag{3}$$

Moreover, the growth rate g is likely to depend on the profit share

$$g = g(\pi); \quad g' > 0 \tag{4}$$

The behavioral assumptions $u = \bar{u}$ and $g = g(\pi)$ can be given two different interpretations. A Robinsonian interpretation assumes that pricing decisions keep utilization at the desired rate in the long run while the growth rate is determined by investment. Alternatively, investment behavior may require that utilization be at the desired rate in the long run (persistent deviations from the desired rate being inconsistent with a constant accumulation rate); in this Kaldorian approach, the dependence of the growth of output on profitability reflects firms' pricing and output

decisions. From a steady-growth perspective the two approaches are equivalent.[10]

Using (3)-(4), the equilibrium condition (2) determines the profit share and the growth rate. As in the Harrodian version, the growth rate need not equal the 'natural rate', but no such equality is required for present purposes: the models are meant to describe the modern (capitalist) sector in a developing economy. An elastic supply of labor to the modern sector implies an endogenous, demand-determined growth rate in this sector.

An upward shift in the g -function raises the growth rate; an upward shift in the saving function $s(\pi)$ reduces the growth rate, assuming $g' < s'$.

A two-sector extension

The one-sector model may provide a useful first stab at the analysis of the modern (formal) sector in a dual economy with large amounts of hidden unemployment in the traditional (informal) sector. Unless the two sectors are completely separate, however, a two-sector setting is required.

In this section we embed the modern sector in a two-sector model. To keep the analysis as simple as possible, assume that

1) the traditional sector uses no capital (empirically, the traditional sector has a much lower capital intensity than the formal sector),
2) workers do not save and consume only informal goods (a stylized version of the empirical observation that most saving comes from non-wage income and that workers' consumption in developing countries is heavily concentrated on food and

housing),

3) the two sectors have the same saving rate s out of non-wage income -- profits, for short (a convenience assumption that could be relaxed),
4) the consumption real wage in the formal sector is constant (efficiency wage arguments could be used to justify this assumption),
5) the share of profits and rents in the informal sector is constant and equal to β (a convenience assumption that could be relaxed),
6) capital goods are produced in the modern sector (informal-sector input to investment could be allowed; it is important for the argument, however, that there is a positive lower limit to the share of the investment good produced by the modern sector),
7) the modern sector has a fixed coefficient production function as in (1).

With these assumptions, real profits (deflated by the informal sector price) in the two sectors are given by

$$\Pi_T = (p-\omega)Y_T \tag{5}$$

$$\Pi_N = \beta Y_N \tag{6}$$

where $p = p_T/p_N$ and $\omega = (w/p_N)$ are the relative price of formal sector goods and the real wage in terms of informal goods. The equilibrium conditions are

$$\begin{aligned} Y_T &= I + C_T^D(p, Y_T, Y_N) \\ &= I + \frac{\alpha}{p}(1-s)(\Pi_T + \Pi_N) \\ &= I + \frac{\alpha}{p}(1-s)[(p-\omega)Y_T + \beta Y_N] \end{aligned} \tag{7}$$

$$\begin{aligned} Y_N &= Y_N^D(p, Y_T, Y_N) \\ &= W + (1-\alpha)(1-s)(\Pi_T + \Pi_N) \\ &= (1-\beta)Y_N + \omega Y_T + (1-\alpha)(1-s)[(p-\omega)Y_T + \beta Y_N] \end{aligned} \tag{8}$$

where α is the proportion of non-worker consumption going to formal sector goods. This proportion will depend on the relative price of formal goods, $\alpha = \alpha(p)$, and we assume that

$$\frac{\partial C_T^D}{\partial p} < 0 \tag{9}$$

That is, tradable and non-tradable goods are gross substitutes in consumption.[11]

The capital stock in the formal sector is predetermined at any moment. If the utilization rate is fixed at $\bar{u}$, a predetermined capital stock implies that Y_T is given, too. Dividing through by K, the equilibrium conditions (7)-(8) can now be re-stated as

$$\bar{u} = g + \delta + \frac{\alpha}{p}(1-s)[(p-\omega)\bar{u} + \beta y_N] \tag{10}$$

$$y_N = (1-\beta)y_N + \omega\bar{u} + (1-\alpha)(1-s)[(p-\omega)\bar{u} + \beta y_N] \tag{11}$$

where $y_N = Y_N/K$. Combining equations (10)-(11), a standard IS condition can be derived[12]

$$p(g+\delta) = s(\beta y_N + (p-\omega)\bar{u}) \tag{12}$$

Finally, retaining the link between profitability and growth in the modern sector, as given by equation (4), we have

$$g = g(\pi) = g(\frac{p-\omega}{p}) = \phi(p); \quad \phi'(p) > 0 \tag{13}$$

Any two of the three equations (10)-(12) can be used in combination with (13) to

determine solutions for the relative price p and the ratio y_N of informal sector output to the capital stock.

The two-sector model combines price and quantity adjustment and, not surprisingly, the solution is a little more complex than in the one-good version. A Robinson/Kaldor adjustment via the profit share (and relative prices) rules in the formal sector which has a constant utilization rate; quantity adjustment comes into play in the informal sector which has excess capacity (underemployment).[13]

The solution is illustrated graphically in figure 2, using equations (11) and (12). The equilibrium condition for the informal sector, equation (11), does not include g ; it defines p as an increasing function of y_N. The slope of the IS relation, by contrast, is ambiguous. The downward-sloping case in figure 2 is ensured if (i) $\beta y_N < \omega\bar{u}$ and (ii) ϕ' is 'small'.[14] The first condition requires that informal sector profits be less than formal sector wages; the second is a generalized `Robinsonian stability condition'.

Figure 2: Two-sector equilibrium

With these assumptions, an upward shift in the investment/growth function unambiguously raises both Y_N and p (see Figure 3a). A fall in the saving rate produces an upward shift in both curves (see Figure 3b). The effect on y_N is ambiguous; p increases, however, as does the growth rate g.

Figure 3a: Upward shift in g-function

Figure 3b: Reduction in s

Figure 4: Upward shift in g-function with positively sloped IS curve

This analysis shows that an expansionary aggregate demand policy (a reduction in taxes, for instance, to reduce the average saving rate) may have positive long-run growth effects in the two-sector model. Unlike in the one-sector model, moreover, faster growth need not come at the expense of lower real wages in the formal sector. The product real wage will fall, but by assumption workers consume only informal sector goods. and the consumption real wage remains constant. These results, it should be noted, are contingent on the slope of the IS curve: this curve need not be downward-sloping, and if it slopes upwards the comparative statics may be reversed (see figure 4).

3.2 A two-sector open economy

Moving to a small open-economy setting, we assume that the formal sector produces a traded good; the output in the informal sector by contrast is non-traded. To keep things simple, the world demand for the traded good is taken to be perfectly elastic at the given world market price, EP^* where P^* is the foreign currency price of the traded good and E is the nominal exchange rate. Thus,

$$p = \frac{EP^*}{p_N} \equiv q \tag{14}$$

where q -- defined as the ratio of the price of traded good in domestic currency to the

price of the non-traded good -- is a measure of the real exchange rate.

With a perfectly elastic foreign demand for the traded good, net exports emerge as the residual after domestic demand has been met:

$$NX_T = Y_T - I - C_T \tag{15}$$

In this setting, an increase in the demand for the modern good does not generate a rise in relative price p ; net exports simply fall. Thus, a general increase in domestic demand leaves $p_T = EP^*$ unchanged and may put upward pressure on p_N . The likely results include a real appreciation (a fall in q), balance of payments problems, and a decline in modern-sector profitability and accumulation.

These results severely limit the usefulness of a pure demand policy (which in the simple model corresponds to a fall in the saving rate). A stimulus that shifts the growth function (a subsidy to investment, for instance) fares a little better. It may raise the growth rate of the modern sector, without downward pressure on the relative price p . But with a given relative price, there are no expansionary effects on informal-sector output. Moreover, an investment stimulus also generates a deterioration of the trade balance.

The implication is not that aggregate demand policy becomes irrelevant. The analysis does imply, however, that aggregate demand policy cannot stand alone. What is required in this open economy is a combination of aggregate demand and real-exchange rate policy. To compensate for the increase in demand and maintain the trade

balance, the domestic consumption of traded goods must be squeezed; that is, the real exchange rate (the relative price of traded goods) has to increase. To illustrate, if $NX = 0$ has to hold, equation (15) implies that

$$\frac{C_T}{K} = \bar{u} - (g + \delta) \tag{16}$$

Hence, using (9) and (14),

$$q = \chi(g); \quad \chi' > 0 \tag{17}$$

A nominal depreciation of the exchange rate can be used to achieve the adjustment in q. But there is an obvious danger: if nominal prices of domestic goods respond to the depreciation, the interplay between domestic wage formation and exchange rate policy may produce accelerating inflation (see Rapetti 2011a).[15] The next section briefly discusses some well-known episodes that fit this pattern.

4 Latin American experience

Latin American economic history supports the RER-growth link.[16] The region has seen a number of episodes in which persistent RER overvaluation led to balance of payments and financial crises with long-lasting negative effects on economic growth.[17] Many of these episodes began with the implementation of macroeconomic stabilization programs 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 RER, 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 did increase, the appreciation of the RER favored investment in non-tradable activities with little increase in the export capacity that was required to repay foreign debt.

In a second phase, the excessive external borrowing provoked concerns about the sustainability of the fixed exchange rate regimes and triggered speculative attacks against the domestic currencies. The effect of capital outflows was typically contractionary. In many cases, the domestic banking systems -- which were short in foreign currency and long in local assets -- went bankrupt, exacerbating the negative impact on economic activity. In cases in which the collapse of the financial system was severe and the external debt burden very high, the crises had long-lasting effects on economic growth. Clear examples of these dynamics are the stabilization programs 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 programs leading to crises occurred during the 1990s in Mexico (1994-95), Brazil (1998-99), Argentina (2001-02) and Uruguay (2002).

On a smaller scale, economic growth was curtailed in many Latin American countries in the post WW2 period by recurrent balance of payments problems and stop-go cycles. A combination of fixed exchange rates and high inflation produced overvalued exchange

rates; the resulting shortages of foreign exchange reserves required an adjustment of the parity; devaluations alleviated the balance of payments problems (mainly due to the fall in the demand for imports caused by their contractionary effect on aggregate demand) but also tended to accelerate inflation because of wage indexation and real wage resistance. A real appreciation of the RER followed with renewed balance of payments difficulties. This cyclical stop-and-go pattern was a main reason for mediocre growth during this period.

In order to escape the stop-go pattern and avoid recurrent RER overvaluation, several countries introduced passive crawling peg regimes in the mid and late 1960s. Argentina pioneered this regime in early 1964; it was followed by Chile in April 1965, Colombia in early 1967 and Brazil in August 1968.

Economic performance improved significantly after the adoption of the crawling pegs. Chile achieved annual growth rates of 4 percent between 1965 and 1970 and non-copper exports expanded substantially.[18] Colombia experienced its highest economic growth in the post WW2 period: GDP grew at 6.6 percent annually during 1967-1974 and the value of non-traditional exports increased by a factor of seven. The implementation of the crawling peg in Brazil marked the beginning of o *milagre econômico* (the economic miracle). Between 1968 and 1973, the economy grew at an average rate of about 11 per cent per year and exports more than tripled, stimulated by the expansion of non-traditional items. In Argentina, growth acceleration and export diversification followed the implementation of the crawling peg. The regime was

abandoned in mid 1967, but the authorities managed to keep the RER relatively stable and competitive in the subsequent period through a sharp devaluation in 1968. A second round of devaluations began in mid-1970, but in this case inflation accelerated and the RER gradually appreciated, prompting a massive balance of payments crisis in 1975. Overall, between 1964 and 1974, GDP grew at 5 percent per year, non-traditional exports increased from representing less than 5 percent of total exports to about 25 percent and the trade balance remained always balanced or positive.

The inflationary dangers of a crawling peg also surfaced in Argentina and Colombia. In Argentina, exchange rate adjustments maintained RER stability but also contributed to high inflation, around 30 percent per year. In Colombia, inflation gradually increased from 5-10 percent before the implementation of the crawling peg to about 25 percent by the late 1970s and early 1980s. In Brazil and Chile, by contrast, the adoption of the crawling peg did not change inflationary dynamics substantially. In Brazil inflation remained around 20 percent and only accelerated after the first oil shock in 1973; in Chile inflation fell slightly.

The above examples illustrate connections between exchange rates, inflation and the sustainability of fast growth. Two other examples – which probably provide the closest fit to the model in section 3 – are the experiences of Chile in 1984-97 and Argentina in 2002-2011.[19] In both countries the exchange rate regime was designed to maintain stable and competitive RERs, and in both countries the implementation came after severe financial and external crises and in contexts of high unemployment (around 25

percent).

After a sequence of devaluations, Chile introduced a crawling band scheme in 1984: the central parity was adjusted every month to preserve a stable and competitive RER. The policy was successful. GDP grew at a 7.6 percent average annual rate between 1985 and 1997 -- the longest period of sustained high growth in Chile's history. Although the industrial sector grew rapidly and steadily (6.4 percent per year), manufacturing exports were the star of the Chilean experience: the level of manufacturing exports grew at 11.5 percent per year, new geographical markets were developed, and the range of exported goods increased significantly. It was during this period that Chile managed to establish its international reputation as exporter of salmon and wine and developed non-traditional export industries such as footwear and forestry products (e.g., furniture).

Emulating Chile's experience with crawling bands, Argentina adopted a pragmatic managed floating regime in 2002-03. Similarly to Chile in 1984, the country was unable to obtain voluntary foreign financing due to the sovereign debt default in early 2002 and the aggressive debt restructuring in 2005. By maintaining a stable and competitive RER, the authorities managed to reduce the domestic consumption of tradables and expand the production of import substitutes and exports; in this way resources became available to service the foreign debt, to finance imports of the inputs and capital goods that were required to sustain high growth rates and to even run current account surpluses.

During the 2002-2011 period Argentina maintained an average growth rate of 7.5 percent, experiencing a short contraction in 2009 due to the effects of the global recession. Since the mid 1970s Argentina had not grown for more than four years in a row. The only comparable episode of high and sustained expansion since WW2 was the 1963-74 period, with an average GDP growth rate of 5 percent. Between 2002 and 2010, industrial (tradable) production grew at an annual rate of 9.5 percent. By mid 2005, it had recovered to the previous peak (mid-1998) and since then it has expanded at 7.2 percent annually. Exports were very dynamic until the effects of the global financial crisis; they suffered a short contraction in mid 2008 but regained momentum by mid 2009, although at a lower pace. During the initial 6-year period (mid-2002 to mid-2008), exports of goods and services grew at almost 9 percent per year in real terms. The most vigorous components were manufacturing and service exports with average annual growth rates of 14.5 percent and 21.2 percent, respectively.

The similarities between Chile in the 1980s-1990s and Argentina in the 2000s may be clear but there are also significant differences. In Chile inflation gradually decelerated and the competitive RER strategy was abandoned after about 13 years, not because of signs of unsustainability, but because of the authorities' conviction that the next stage of economic development required a more market-friendly approach to macroeconomic management. In the case of Argentina, by contrast, inflation increased gradually from about 2005, eroding the country's international competitiveness. Macroeconomic policy provides the main explanation for this difference between the two countries. In Chile the exchange rate policy was part of a coordinated package. In Argentina, by contrast, the

RER strategy was combined with highly expansionary fiscal, monetary and wage policies. Inflation was the predictable result; by late 2011, the signs of foreign exchange bottlenecks were obvious and the government had to implement measures to control imports.[20]

5 Conclusion

Economic theory has identified many ways for governments to promote development. Current trends may favor market oriented approaches and non-intervention. Sound analysis and evidence, however, show the potential for successful intervention. ‘Picking winners' can affect long-run growth,[21] and ‘big push' theories have highlighted market failures associated with complementarities. In this paper we have disregarded these (and other) reasons for policy intervention. The focus has been on the ‘Keynesian’ problem of underemployed resources and, in particular, hidden unemployment. (Post-)Keynesian theory often addresses this development problem using single-sector models of the ‘modern sector'. These models may provide a good starting point but they can also be misleading.

We have tried to highlight the connections between our simple two-sector model and well-known single-sector models; the differences arise because the modern and traditional sectors interact in the two-sector model and because we include open-economy issues. We have shown how aggregate demand can limit output, even in a small open economy facing a perfectly elastic demand for its traded good. But expansionary aggregate demand policy may fail to solve the problem. A successful

strategy for economic development requires the right combination of real exchange rates and investment promotion. It is essential, moreover, to coordinate the exchange rate policy with the general macroeconomic policy. A failure to do so can lead to inflationary spirals, an outcome that has not been uncommon in Latin American economic history.

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Endnotes:

[1]This paper is based on a presentation at the conference on ``Inflación y Crecimiento Económico: Evaluación y Perspectivas, Puebla, November 2011. We thank participants at the conference for helpful comments.

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[5]Whether modern tradables are effectively the locus of increasing returns and thus the engine of economic growth remains controversial in terms of empirical evidence (Eichengreen, 2007). This does not necessarily undermine explanations based on the productivity channel. Economies of scale can result from horizontal and vertical linkages in domestic production *a la* Hirschman (1958). A higher RER would improve relative tradable profitability, but this profitability redistribution would not necessarily cancel out. Depending on the nature of domestic production linkages, the improvement in tradable profitability may more than offset the harm to the non-tradable sector.

[6]This issue has been examined extensively in Kaleckian models; e.g. Bhaduri and Marglin 1990, and Blecker, 1989. In these models both both expansionary and contractionary cases are possible.

[7]Razmi et al. (2012) develop a slightly more general version of the model in section 3 which includes attention to short-run issues. The paper finds robust evidence in favor of the idea that a higher RER fosters investment growth in panel data tests with a large sample of countries. The relation between output growth and the RER is examined in Rapetti et al. (2012)

[8]This assumption excludes the Kaleckian models. See Skott (2012a, 2012b) for a recent critique of Kaleckian models; Hein et a. (2012) present a recent defense of the models.

[9]This specification has a long tradition in neo-Marxian and post-Keynesian theory. Kaldor's justification -- the "neo-Pasinetti theorem" -- is an early post-Keynesian example of stock-flow consistent modeling (Kaldor 1966, Skott 1981). Mainstream Ramsey models of intertemporal optimization also imply a profit effect on saving, but for different reasons.

[10]The short-run dynamics are different, and the cyclical patterns in mature economies

favor the Kaldorian interpretation; see Skott and Zipperer (2010). Nakatani and Skott 2007 use the Kaldorian model to give a unified account of Japanese growth (pre 1990) and stagnation (post 1990).

[11]The gross substitutabilty assumption would be questionable if modern-sector profits were the main source of formal-good consumption (an increase in p raises modern-sector profits). Empirically, however, the assumption is likely to hold: most developing countries have a large traditional sector and/or consumption of formal goods by workers. (Our simplifying assumption that workers consume only traditional goods could easily be relaxed; see Razmi et al., 2012).

[12]Multiply (10) by p; add the resulting equation to (11) and rearrange.

[13]The informal sector is modeled here as a market sector; a separate, non-market, subsistence sector could be included.

[14]These conditions are sufficient, but not necessary.

[15]It should be noted that a fall in the saving rate (corresponding to expansionary fiscal policies) will raise the required RER q in equation (17) for any given value of the growth rate g. This is important because the severity of any inflationary problems is likely to be directly related to magnitude of the devaluation.

[16]See Frenkel and Rapetti (2012) for a historical analysis of the effect of RER levels on economic performance in Latin America.

[17]See Taylor (1998) and Frenkel and Rapetti (2009) for analysis of these boom-bust dynamics.

[18]Exchange rate policy shifted to a fixed regime in 1970, when Salvador Allende took office.

[19]For a detailed analysis of these experiences see Rapetti (2011b), chapter 5.
[20]See Rapetti (2011b), chapter 5 for details.

[21]Even Lucas (1988, section 5) has recognized this although he is quick to dismiss the practical relevance.

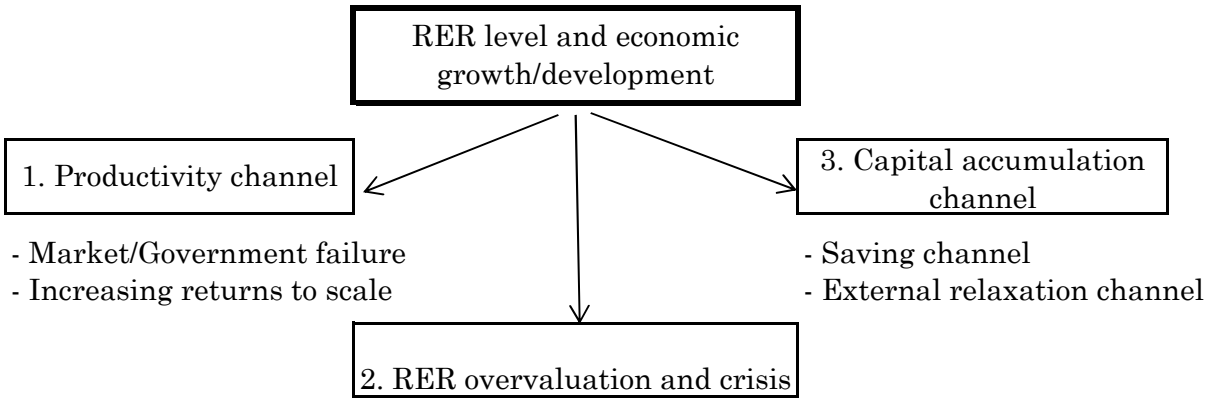

Figure 1: Channels linking RER levels and economic growth

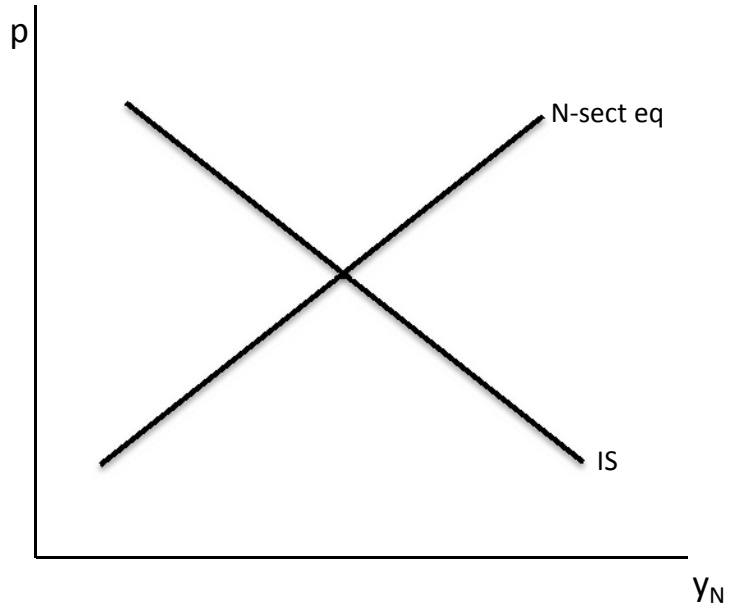

Figure 2: Two-sector equilibrium

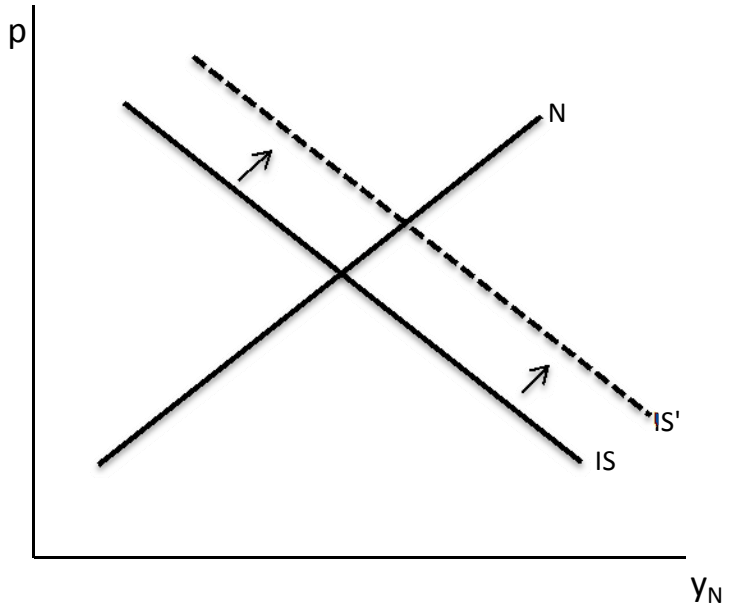

Figure 3a: Upward shift in g-function

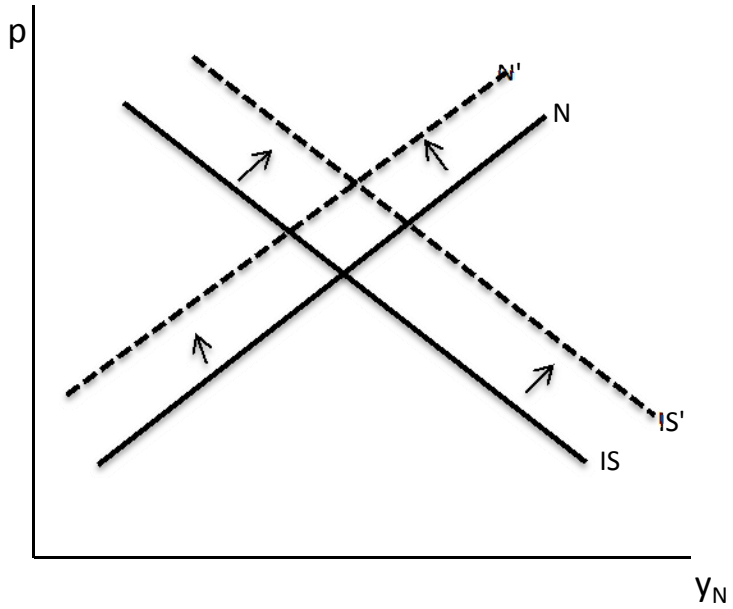

Figure 3b: Reduction in s

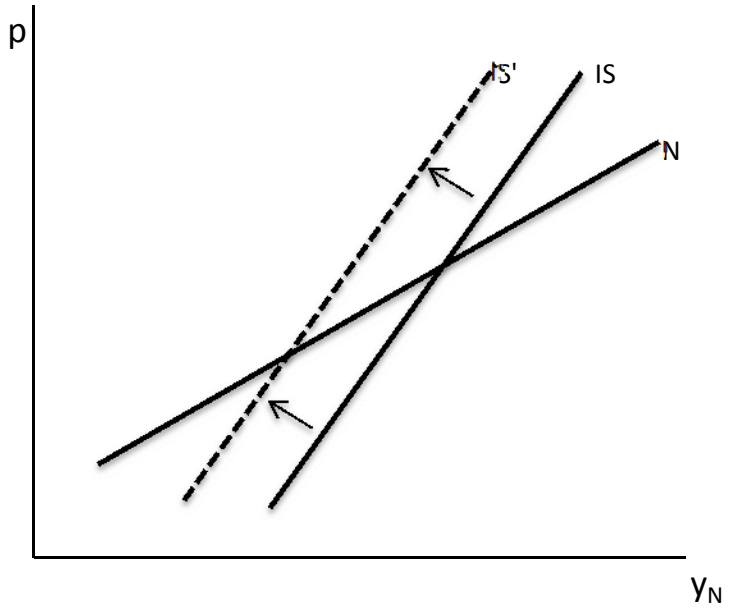

Figure 4: Upward shift in g-function with positively sloped IS curve