



Endogenous elasticities and the impact of the real exchange rate on structural economic dynamics[☆]



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ABSTRACT

This paper aims at showing that the level of the real exchange rate affects the rate of economic growth. More specifically, we extend the model developed by Araujo and Lima (2007) to derive a balance-of-payments equilibrium growth rate analogous to Thirlwall's Law based on a Pasinettian multi-sector macrodynamic framework in which income elasticities are endogenous to the level of the real exchange. Furthermore, the model is built to relate growth, the real exchange rate and sectoral heterogeneity. From a cumulative causation perspective, we thus demonstrate the effect of the level of real exchange rates on the generation of technological progress, and how these rates also impact the growth of the whole economy via a balance-of-payments constrained approach. Finally, we show that an undervalued real exchange rate has positive effects on economic growth in developing countries.

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1. Introduction

Different approaches have characterised the study of the exchange rate, each stressing one particular aspect of its effects on economic performance [see Frenkel and Taylor (2006)]. But now a burgeoning literature on the effects of devaluations on growth via structural changes is emerging.¹ Such trend contrasts with the traditional neoclassical approach that does not take into account the possible link between exchange rate devaluations and economic growth. Arguably, the main models in such tradition present the economy aggregated in either one or two sectors [see e.g. Solow (1956) and Uzawa (1961)], a hypothesis that hinders a

proper understanding of how structural changes and thus economic growth may be caused by changes in the level of the exchange rate. The view that traditional growth theories do not give the real exchange rate – RER hereafter – its proper role as one of the engines of growth is supported by authors such as Rodrik (2008) and Eichengreen (2008). While the former considers that this link is not explicitly theorised, the latter goes further and considers that neither the first nor the most recent generation of neoclassical growth models² take into account the potential effects of the RER on growth. In fact, both authors aim at building these links theoretically and providing a better comprehension of the role of the RER in growth spurts.

While Eichengreen does rely on recurrent mechanisms such as price competitiveness to explain the link between the RER and economic growth, Rodrik provides new details that are closer to the argument presented here based on two premises. The first assigns a “special” role to tradables in the growth process of low and middle-income countries and the second understands structural changes as one of the driving forces of economic development. Based on these premises, he considers that tradable goods suffer disproportionately from the government or market failures that keep

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¹ Most recent studies that deal with the effects of a devalued exchange rate on growth link these phenomena on the grounds that variations in the exchange rate produce structural changes due to the shift in the relative prices of tradables and non-tradables [see e.g. Rodrik (2008) and McMillan and Rodrik (2011)].

² The author is referring to models developed under the rubric of the New Growth Theory. For a survey on such models see Romer (1994).

poor countries from converging towards higher-income levels. In this vein, the RER may be adopted as a second-best mechanism to alleviate barriers that prevent underdeveloped countries from undergoing structural changes towards the development of more industrialized sectors.

In fact, that an overvalued RER may damage growth due to its negative effect on structural dynamics is a view supported by a number of authors. [McMillan and Rodrik \(2011\)](#), for instance, by acknowledging that successful growth experiences may be largely explained by proper structural changes, conclude that countries maintaining competitive or undervalued currencies tend to experience more growth-enhancing structural changes. Accordingly, an overvalued currency further squeezes the tradable industries, especially damaging the more modern manufacturing ones that operate at tight profit margins. According to this view, productivity gains that accrue from the reallocation of resources and labour force from low to high-productivity sectors may be more expressive than those obtained through 'within' sectoral productivity shifts. Hence, policies that strengthen the high-productivity sectors – i.e., which increase their share in the total labour force – are behind successful growth experiences.

This view is also shared by [Razmi et al. \(2012\)](#), who focused on structural changes due to the mobilisation of underemployed resources as a source of economic growth. According to the authors, an undervalued exchange rate also works through its positive impact on the share of tradables in the economy, especially industry. To the extent that real exchange rate depreciation relaxes the balance-of-payments – BoP hereafter – constraint, it would lead to a lower domestic demand for tradables. Assuming that foreign demand is inelastic, total demand cannot be affected since the remaining production is exported. Later on, the production capacity of the tradable sector is expanded. [Porcile and Lima \(2010, p. 1020\)](#) also emphasised the importance of keeping a high, competitive real exchange rate to spur exports and foster growth in the long run. According to them, “[c]ountries that sustained very high levels of economic growth over decades, like Korea, Taiwan, Singapore and more recently China, kept their real exchange rate at competitive levels. (...) Inversely, countries that overvalued their currency were frequently caught in low-growth traps, suffering from long periods of feeble growth”.

[Baldwin \(1988\)](#) focuses on large RER shocks on the market structure in the presence of hysteresis. According to the author, if market entry costs are sunk, sufficiently large RER shocks may induce investment decisions that not may be reversed later. In this vein, the structure of the market is changed with permanent effects on growth, a view that is confirmed by [Baldwin and Krugman \(1989\)](#). The authors propose that large exchange rate fluctuations lead to entry or exit decisions that are not reversed when the currency returns to its previous level. According to this range of vision, even if the RER may, in fact, be stationary in the long run – as the mainstream claims – the short run might be long enough to entail structural changes. In other words, even temporary exchange rates shocks may give rise to permanent shifts in the BoP constraint that will produce favorable or unfavorable structural changes and growth performance.

A common aspect shared by all these studies is that the effect of the RER on the growth performance can be properly understood just by considering its effects on the sectoral structure of the economy. Building on these premises and using a disaggregated model, [Araujo \(2012\)](#) showed that the weight of the relevant elasticities that enter a multi-sector Thirlwall's law is affected by the competitiveness of the sectors, which are in turn ultimately determined by the level of the RER. Thus, even in the case in which the sectoral elasticities of the demand for imports and exports are constant, it is possible to conclude that there may be structural changes due to variations of the exchange rate. In this set-up, once-and-for-

all changes in the level of the RER may play an important role in the determination of the balance of payment growth rate even if the argument of the quantitative unimportance of relative price movements holds.

Authors such as [Palley \(1996\)](#), [McCombie and Roberts \(2002\)](#), [Ferrari et al. \(2013\)](#) and [Missio and Jayme \(2012\)](#) have been working on the hypothesis of endogenous income elasticities of foreign trade. This allows for connecting many of the arguments that underpin the importance of the RER for growth. In other words, by supposing that the exchange rate can change the income elasticity of the demand for imports and exports, new transmission mechanisms highlight the importance for economic growth of managing the RER especially in developing countries. This hypothesis indicates, for instance, that the BoP constrained equilibrium condition is not 'exogenously' determined by the ratio of the income elasticity of the demand for exports and imports. Rather, this ratio is endogenous to particular exchange rate policy.

The aim of this paper is to show that the level of the RER affects the growth rate. In order to do so, we extend the model developed by [Araujo and Lima \(2007\)](#), deriving a BoP equilibrium growth rate from a Pasinettian multi-sector structure [see [Pasinetti \(1993\)](#)] that is endogenous to the level of the RER. Besides, we built the model using the shortcuts presented in [Araujo \(2013\)](#), introducing a new assumption, which is an additional contribution over [Araujo and Lima \(2007\)](#) and [Araujo \(2012\)](#): endogenous income elasticities of foreign trade. Endogenous elasticities have proved relevant in two aspects. Firstly, they reveal the impact of nominal and RER on the growth rate of technological progress, based on the cumulative causation view. Secondly, because they also show how these exchange rates affect the growth rate of the whole economy via the BoP. Accordingly, the results clearly show the importance of a correct policy regarding the RER, not only to spur technological progress but also to relax the BoP constraint.

This paper is organized as follows. In the second section we present a brief review of the literature about the hypothesis of endogenous income elasticities of the demand for imports and exports, as well as the main arguments that relate RER levels to income elasticities. In Section 3 we extend the formal approach developed by [Araujo and Lima \(2007\)](#) to incorporate endogenous elasticities of demand in the multi-sectoral version of Thirlwall's law and we consider endogenous technological progress that accrues from sectoral Kaldor-Verdoorn's law. Finally, Section 4 concludes.

2. Endogenous elasticities and competitive levels of real exchange rate

[Rodrik \(2008\)](#) presented new transmission mechanisms between changes in the exchange rate policy and output growth. Since then, a series of empirical works suggest a close connection between a competitive exchange rate and economic performance [see e.g. [Razmi et al. \(2009\)](#), [Razmi et al. \(2012\)](#), [Missio et al. \(2015\)](#), [Boggio and Barbieri \(2017\)](#) and [Guzman et al. \(2016\)](#)]. We can identify different approaches that focus on establishing the relationship aforementioned in open economy growth models.³ In this paper we are interested in advancing the explanations that emphasizes the role of competitive RER in relaxing the foreign exchange constraint on growth (BOP-constrained model). To do so, we need to analyze more precisely the hypothesis of endogenous trade income elasticities.

Introducing endogenous elasticities in the BoP constraints framework is a way to blend the demand-led approach to economic

³ See [Razmi \(2015\)](#), [Boggio and Barbieri \(2016\)](#) and [Missio and Gabriel \(2016\)](#), among others.

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