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A note on the political economy of exchange rates in Argentina: new and classical developmentalism re-evaluated*

Uma nota sobre a economia política das taxas de câmbio na Argentina: o novo e clássico desenvolvimentismo reavaliado

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RESUMO: O artigo desenvolve um modelo no qual se explicita a relação entre a taxa de câmbio real e o salário real, no contexto de distribuição de renda conflitante. Nota-se que o banco central tenta regular a relação distributiva taxa de câmbio e salários reais por meio de mudanças na taxa de juros. O ponto teórico é que, em certas circunstâncias, um nível relativamente depreciado ou alto da taxa de câmbio real pode reduzir os salários reais e ter um impacto negativo no crescimento econômico. O artigo também fornece algumas evidências para o caso argentino e sugere que o clássico pessimismo da elasticidade desenvolvimentista parece ser validado no caso da Argentina. Além disso, o uso da taxa de câmbio como instrumento para reforçar a redistribuição para longe da classe trabalhadora e para promover o investimento e o crescimento também não nasce nos dados.
PALAVRAS-CHAVE: Desenvolvimento econômico; taxa de câmbio; Argentina.

ABSTRACT: The paper develops a model in which the relation between the real exchange rate and the real wage, in the context of conflictive income distribution, is made explicit. It is noted that the central bank tries to regulate the distributive relation exchange rate and real wages through the changes in the interest rate. The theoretical point is that, under certain circumstances, a relatively depreciated or high level of the real exchange rate might reduce real wages and have a negative impact on economic growth. The paper also provides some evidence for the Argentine case, and suggests that the Classical Developmentalist elasticity pessimism seems, in the case of Argentina, to be validated. Also, the use of the exchange rate as an instrument to bolster redistribution away from the working class, and to promote investment and growth is also not born in the data.
KEYWORDS: Economic development; exchange rate; Argentina
JEL Classification: O11; F31; O54.

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INTRODUCTION

One of our main concerns with the relation between exchange rates and income distribution is the increasing consensus among economists that a devalued exchange rate is necessary for growth (e.g.,, Rodrik, 2008), and particularly the notion that a devalued exchange rate was central for the successful Asian experience (i.e. China). In Latin America the New Developmentalists, following Bresser-Pereira's, see a competitive industrial exchange rate as a necessary instrument for development (e.g., Frenkel, Ros, Taylor, etc.). Conventional theory has emphasized the role of the exchange rate as anchor for prices and many central banks in the region use it as part of inflation targeting systems to maintain stability, even if they do it with some inconsistency (Pérez and Vernengo, 2013). The traditional tradeoff is between a more devalued currency for growth and a more appreciated one for price stability (e.g., Broz and Frieden, 2006). Note that we are talking more about the level of the exchange rate (relatively appreciated or depreciated), rather than choices about the exchange rate regime (float, fix or something in between).

Exchange rate policies, however, are significantly more complex, and related to income distribution, and that exchange rate policies affect the other two crucial macroeconomic prices, namely: the real wage and the real interest rate (and the rate of profit). Old and forgotten Structuralist or Classical Developmentalism concepts (e.g., contractive depreciation and elasticity pessimism) would suggest a very different story or tradeoff. In this view the conventional tradeoff is not enough to understand the dynamics of real exchange rates. Sometimes a depreciated rate would be an instrument of real wage reduction by the central bank and capitalists, and an appreciated rate would allow for the expansion of the domestic market and higher growth. A more appreciated exchange rate in Latin America than in Asia, for example, might reflect a more militant working class with higher bargaining power and more wage resistance, and the reasons for Asian success might be associated to other policies related to the role of the developmental state.

The rest of the paper is divided in three sections. The following sections develops a model in which the relation between the real exchange rate and the real wage, in the context of conflictive income distribution, is made explicit. It is noted that the central bank tries to regulate the distributive relation exchange rate and real wages through the changes in the interest rate. The theoretical point is that, under certain circumstances, a relatively depreciated or high level of the real exchange rate might reduce real wages and have a negative impact on economic growth. The subsequent section tries to show the evidence for the Argentine case. It is suggested that the Classical Developmentalist elasticity pessimism seems, in the case of Argentina, to be validated. Also, the use of the exchange rate as an instrument to bolster redistribution away from the working class, and to promote investment and growth is also not born in the data. The last section provides some conclusions.

BEYOND THE CONVENTIONAL VIEW ON EXCHANGE RATES

Conventional theories on exchange rate regimes suggest that in the long run the currency prices reflect a process of arbitrage, either prices of goods and services traded between countries follow some version of the law of the one price, resulting in the Purchasing Power Parity (PPP) theory, or the return of financial assets, in some version of the Interest Parity Condition (IPC). The differences, to some extent, depends on the influence of the components of the current account or capital and financial accounts in the balance of payments to explain the exchange rate. In the case of the PPP it is essentially an extension of the law of the one price, and the idea is that, abstracting from transport costs, trade restrictions, and other real-world frictions, the prices of tradable goods would be equivalent. In other words, if a given good is cheaper elsewhere, so economic agents buy foreign currency, and domestic currency devalues. Causality would go from prices to the exchange rate. Similarly, IPC assumes that the return on financial assets, abstracting different risk profiles and other transaction costs, domestic and foreign assets are equal. The depreciation of the exchange rate would reflect the domestic agents' search for foreign currency to obtain financial assets in foreign currency. In this way, instead of looking for foreign currency for reasons related to consumption, and trade or current account balance, as in the case of the PPP, economic agents would be driven by financial issues related to the capital and financial account of balance of payments.

Although each theory ends up imposing the predominance of either the current or financial account, which have implications about the relative relevance of the real or financial components in the determination of the exchange rate, and are not equivalent, both theories suggest something similar and are complementary within the context of the marginalist theory.[1] For example, taking the well-known argument by Wicksell, if the monetary interest rate is below the natural interest rate, there will be excess investment over savings, and with the economy in full employment, an inflationary process will ensue. In that case, the low interest rate would cause capital flight and devaluation of the exchange rate. In the same way one could say that domestic inflation would be behind devaluation, and both PPP and the IPC would have the same effect. Even though both PPP and IPC end up by deriving a similar theory of the exchange rate determination, it is reasonable to assume that, in a world with daily transactions in the foreign exchange market of more than US$ 5 trillion, the predominance of the financial and capital account is difficult to question.

Thus, we could say that the equilibrium exchange rate in the marginalist the-

[1] Knut Wicksell, who is by far the fundamental author for understanding modern macroeconomics, is responsible for a preliminary version of the IPC, prior to Keynes which is sometimes incorrectly seen as the author behind that theory. Wicksell is the biggest initial critic of the PPP developed by Gustav Cassel. Both theories, however, presume a trend of the market economy to full employment. For a discussion of the limitations of both theories, and the view that PPP constitutes a natural exchange rate equivalent to the Wicksellian natural rate of interest see Vernengo (2001).

ory is directly related to the natural rate of interest, or the natural rate of unemployment. In that sense, the theory of the exchange rate of the marginalist or neoclassical economy has the same problems associated with the theory of value and distribution that were raised during the famous capital debates. Prior to these debates, Keynes criticized strongly the idea of the natural rate of interest. Although Keynes surely was not aware of issues related to the theory of value,[2] it is quite clear that, following the debate between Piero Sraffa and Friedrich Hayek about the commodity rate of interest, Keynes understood the limitations of the natural rate of interest. Not only does it tell us that the natural rate is a bad idea, but it also suggests that the normal rate of interest is rather historically and institutionally determined and is not merely a psychological rate dependent purely on individual expectations (Keynes, 1936). It is important to clarify that the relevant outcome of capital debates, generally accepted by all (see Samuelson, 1966), suggests that there is no relationship between the intensity of the use of capital and its remuneration, and therefore the principle of substitution, central in the marginalist analysis, it would lose its role as a mechanism for allocating resources. Relative prices would not be the result of scarcity or relative abundance, or the supply and demand. In that sense, the normal interest rate, determined by historical and institutional mechanisms may well be such that the economy is in equilibrium below full employment.[3]

That point has direct implications for the theory of the exchange rate determination and is devastating for both for PPP and for the IPC views. For example, an increase in the money supply, everything else constant, in the case of the PPP view, or a lower monetary interest rate, in the case of the IPC theory, would result in higher domestic prices, and a more depreciated exchange rate. However, the adjustment mechanism would require that the economy be at the full employment level, and that the adjustment be made through changes prices, instead of quantities. In this case, the increase in the money supply or the decline of the monetary rate of interest can simply have an effect on the level of activity. In that sense, Keynes' concern about the natural interest rate could be taken as the basis of a discussion of the historical-institutional influences on the determination of the exchange rate. Assuming that the normal interest rate is exogenously given by the monetary authority, the dynamics of the exchange rate might be related to the domestic and external interest differential, which unlike the natural rate implicit in the marginal theory does not require full use of capital. Therefore, the monetary authority can control, to some extent, the exchange rate, managing the interest rate.

Based on these ideas, a simple model for determining the real exchange rate can be developed (Vernengo, 2003). First, we analyze the dynamics of the real ex-

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[2] Joan Robinson famously said that, according to Gerald Shove, Keynes never took the twenty minutes needed to understand the theory of value (Robinson, 1962: 76).

[3] Sraffa (1960) argued that the interest rate could be determined exogenously by the monetary authority. The development of this version of the surplus theory is sometimes called the Monetary Theory of Distribution. See Pivetti (1991).

change rate. The model assumes that central banks generally pursue a real exchange rate compatible with capital flows that allow it to meet its short-term obligations, although other reasons may also affect the decisions made regarding the interest rate as, for example, trying to maintain a competitive real exchange rate. In turn, the central banks' decision on the interest rate will have the expected effect on the exchange rate. We would have:

$$\frac{\dot{e}}{e} = \propto \left(\frac{\dot{p}}{p}\right) - \beta(i - i^* - \phi) \qquad (1)$$

That is, the nominal exchange rate, e, is devalued according to the inflation rate, the rate of change of price level, p, and the domestic and foreign interest rate differential, where i is the interest rate, the asterisk represents the international variable, and ϕ is a risk factor. In addition, the parameters α and β are between zero and one. The dynamics of the real exchange rate is given, ε, then, by:

$$\frac{\dot{\varepsilon}}{\varepsilon} = (\propto -1)\left(\frac{\dot{p}}{p}\right) - \beta(i - i^* - \phi) \qquad (2)$$

In other words, the real exchange rate depends on the performance of the central bank to adjust the exchange market to set the nominal exchange rate against changes in domestic inflation, and also, indirectly, given its influence on the capital flows, which react to the interest rate adjustment. An increase in the international interest rate and/or an increase in country risk have the effect of forcing a nominal devaluation, which translates into a real devaluation or stable prices.

In order to understand the dynamics of the exchange rate, it is not sufficient to look at the effects of the exchange rate on the competitiveness of the economy, and how it affects the capital flows related to trade, or financial flows, which are certainly the main sources of supply and demand for foreign currency. It is important to be clear that, in a globally integrated economy, the exchange rate affects the productive structure, and costs, and therefore has effects on prices, and, thus, has important distributive effects. The classical authors of the surplus approach had a clear understanding of conflictive nature of income distribution. Once one considers an open economy, variations in the exchange rate have distributive effects and a definite relation between exchange rates, and the other two macroeconomic prices, the real wage and the interest rate emerges.

The equality aggregate supply and demand implies that wages, profits, taxes and imports that make up the aggregate supply equal to aggregate demand, which is given by consumption, investment, government spending and exports. On the supply side we have:

$$pY = W + R + T + M \qquad (3)$$

Where the variables have the normal meanings, product (Y), wages (W), earnings (R), taxes (T) and imports (M). Dividing, on both sides by the total output, and rearranging we obtain the following:

$$1 - \pi = \omega l + \varepsilon m \qquad (4)$$

In this case, π represents the share of the profits in the total income, ω is the real wage, and l and m represent the coefficients related to the number of workers and the imported goods needed in the production process. If the real exchange rate remains fixed, it is evident that there is an inverse relationship between the fraction of the gains in the total product and the real wage, for the other fixed coefficients. But more relevantly for the present analysis, if the share of profits is fixed, then there is an inverse relationship between the real exchange rate and real wages. In other words, a more devalued real exchange rate corresponds, everything else constant, to a lower real wage.

From the definition of the real wage, we can determine the dynamics of the same in the following terms:

$$\frac{\dot{\omega}}{\omega} = \frac{\dot{W}}{W} - \frac{\dot{p}}{p} = \gamma\frac{\dot{p}}{p} - \frac{\dot{p}}{p} = (1-\gamma)\frac{\dot{p}}{p} \qquad (5)$$

It is assumed that nominal wages increase is given by the coefficient γ (between zero and one). Indexation is less than full. In addition, it is assumed that capitalists have a desired profit share (π^*) and if the actual profit share is below that level, then prices increase. That is:

$$\frac{\dot{p}}{p} = \pi^* - \pi \qquad (6)$$

From the above equations we can rewrite the dynamics of real wages and along with the equation for the real exchange rate system we have the relationship between real wages and real exchange rate, which allows the determination of the real wage and equilibrium real exchange rate. The equations are given by:

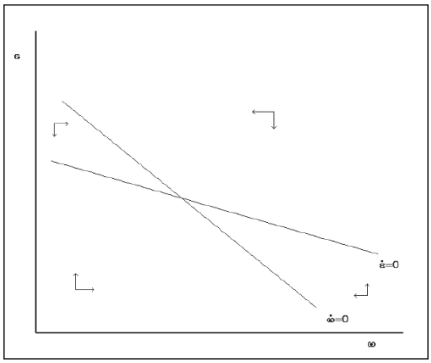
$$\frac{\dot{\omega}}{\omega} = (\gamma - 1)(\pi^* - 1 + \omega l + \varepsilon m) \qquad (7)$$

$$\frac{\dot{\varepsilon}}{\varepsilon} = (\alpha - 1)(\bar{\pi} - 1 + \omega b + \varepsilon m) + \beta(i - i^* - \phi) \qquad (8)$$

The graphical solution is shown in Figure 1, with the ε-dot schedule flatter than the ω-dot one for stability conditions[x] If the real wage increases the profit share falls and, for a given π^*, prices rise, reducing the real exchange rate, and analogously, if the real exchange rate increases, then the profit share falls, and in the same way prices go up and real wages fall.

[x] We have: $\frac{\partial \varepsilon}{\partial \omega}|_{\dot{\omega}=0} = -\frac{l}{m}$ and $\frac{\partial \varepsilon}{\partial \omega}|_{\dot{\varepsilon}=0} = \frac{(1-\alpha)l}{(\alpha-1)m}$ Simple inspection shows that both are negative since $1 < \alpha < 1$, and l, m > 0, which also guarantees that ε-dot is flatter than ω-dot.

Figure 1: Real Wages and Real Exchange Rate

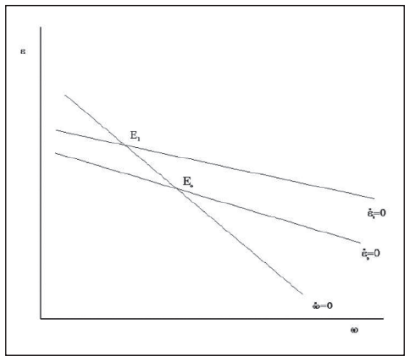


The model allows to address the monetary policy effects on exchange rate determination in an economy with distributive conflict. For example, suppose that an external shock affects the ability to repay short-term external debt, be it as a result of an increase in risk or of the international interest rate. The central bank would be forced to raise the domestic interest rate. Assuming that the increase in the domestic rate is insufficient to contain the external shock, the result would be a higher exchange rate. With that the curve ε-dot moving up and the real exchange rate depreciating. Depreciation implies rising costs, a smaller profit share, and with that an increase in prices, and inflation. Wages are adjusted, but less than the increase in prices, and in the new equilibrium real wages are lower. A similar scenario could follow if a conservative or neoliberal government decides to reduce real wages. A simple way to do this, without directly pressuring nominal wages, is to promote the depreciation of the nominal exchange rate. For this, it is enough to reduce the domestic interest rate, or eliminate capital controls, if they exist. In the model, this would be a lower i or a higher ϕ. The reduction of the interest rate and the elimination of capital controls would lead to capital flight and the depreciation of the exchange rate, the ε-dot schedule would move upwards, and the real exchange rate would depreciate. Depreciation again puts pressure on profits, and with that the entrepreneurs raise prices, driving inflation up, reducing real wages, as shown in Figure 2. The implication is that an exchange rate depreciation can be used as a tool to reduce real wages.

The discussion on the political economy of the exchange rate has been dominated by the growing consensus among economists of different trends regarding the relevance of an undervalued exchange rate for growth and its role in the Asian experience, particularly the Chinese case. In Latin America, New Developmentalist authors suggest that the devalued exchange rate is a necessary condition for the industrialization.[4] Because the New Developmentalist School presumes a positive

[4] The contributions by Luiz Carlos Bresser-Pereira, trying to understand the limits to the liberalization policies implemented in Brazil since the 1980s, and more decidedly in the 1990s, have been central for the New Developmentalist school. See Bresser-Pereira (2004, 2010) and also Frenkel and Taylor (2006).

Figure 2: Effect of an Exchange Rate Devaluation



effect of depreciation on economic growth, it misses the problems associated with the effects of income distribution in the process of economic growth, which were central both in the old classical political economy approach, and for many authors of the classical structuralist school. However, the political economy of the exchange rate is much more complicated and is related, as we saw, to the effects of the exchange rate on the income distribution, and through income distribution it might have perverse effects on economic growth.

Old, but forgotten, structuralist concepts that alluded to the contractionary effects of a devaluation of the exchange rate, and the so-called pessimism of elasticities suggest another vision of the *tradeoff* of exchange rate policy.[5] For example, if a more devalued exchange rate change does not stimulate exports enough, and brings down wages and consumption, pulling the economy into recession – solving the external problem in this way – then it is not very clear that the devaluation is related to growth. It is our belief that the Argentine case illustrates some of these points. The historical and empirical evidence suggests that the exchange rate has been used as an instrument to control real wages, at the expense of the development of the industrial sector, and of economic growth.

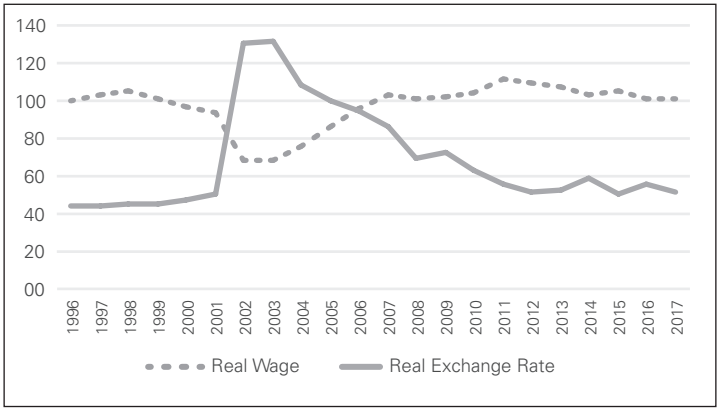
THE ARGENTINE CASE

The Argentine case illustrates some of these points. The inverse relationship between exchange rate and real wages suggests that the exchange rate has been used as an instrument to control real wages. The collapse of Convertibility in 2002, led both to a massive depreciation of the peso, and to a collapse of the economy,

[5] The pioneering works on contractive devaluation are due to Albert Hirschman and Carlos Díaz-Alejandro, and were formalized in Krugman and Taylor (1978). Note that in this case we are not discussing the effects of a devaluation on the level of activity, but the effects of a more devalued exchange rate on economic growth. On the latter see the model in Pérez Caldentey and Vernengo (2017).

with high unemployment, leading to a sizeable reduction of the real wage (Figure 3). The rest of the period under analysis is associated to a long period of real appreciation, and a significant recovery of the real wage, with both reaching a plateau around 2011, when the external situation of Argentina had become again problematic, with deficits in the current account, capital flight contained with foreign exchange controls, and low levels of international reserves.

Figure 3: Real Exchange Rate and Real Wage

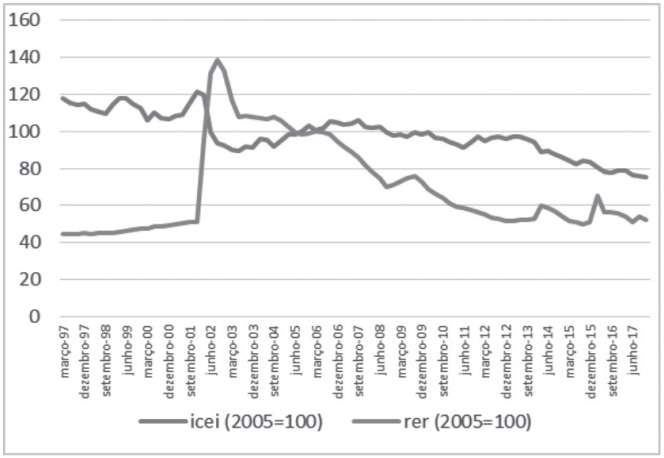


The period between 2003 and 2011 saw a fast recovery of the economy, and many interpreted this a result of the "good luck" hypothesis, that the confluence of a relatively high or depreciated exchange rate, and the growth of commodity exports, were the main cause of the recovery. The good luck hypothesis, rests on a few macroeconomic mechanisms. On the one hand, the higher real exchange rate was associated with a more competitive environment, an increase in exports and a decrease in imports, along the lines of conventional marginalist or neoclassical lines.

Another possibility was that a more depreciated exchange rate would make the domestic industry competitive, and that an increase in the domestic industrial production, if not the exports of the industrial sector, would allow for a significant reduction of manufacturing imports. In other words, some degree of import substitution would take place. This reinvigoration of the domestic industrial production is often associated with New Developmentalist views, and in fact, the Industrial Equilibrium Exchange Rate, as defined by Bresser-Pereira (2022), was below the actual real exchange rate for the period between 2002 and 2005, as shown in Figure 4.

Finally, a neo-Kaleckian type of argument could also be used to suggest that the reduction in real wages, and the increase in the profit rate could have stimulated investment and domestic growth. In all these channels, the more depreciated exchange rate, and the lower real wage, play some role in promoting the recovery. However, another interpretation is possible. The higher real exchange rate, above the industrial equilibrium rate, might not have been instrumental for the recovery of exports, or for the reduction of imports, particularly of manufactured goods. The

Figure 4: Industrial Equilibrium Exchange Rate Index (ICEI) and RER



Classical Developmentalist elasticity pessimism might still be correct. In that case, recovery might have been associated to the expansion of domestic demand, in particular government spending, and the expansion did not lead to external problems, because the combination of higher commodity prices and the default on foreign external debt created the conditions to lift the external constraint.

In addition, the slow recovery of the real wage, and the expansion of the domestic economy led to a recovery of domestic investment, through the accelerator, and a comeback of some industrial activities, that had suffered during the long Convertibility period. In this view, the real exchange rate reflects, the distributive conflict. The relatively high real wage creates the conditions for a larger fiscal multiplier, since, in Kaleckian fashion, workers tend to spend a large share of their income. Fiscal expansion would have more impact under these circumstances. In order, to analyze the alternative possibilities in the Argentine case, we look at the recent evidence, in particular regarding the macroeconomic mechanisms behind the conventional view, and the New Developmentalist alternative.

If trade price elasticities are analyzed, it is clear that they are small, not only in Argentina but in many peripheral countries. For Argentina, the values of the long-term price elasticities of exports are quite low. For exports, the price elasticity measurements give 0.07 and for imports 0.37. These do not meet the Marshall-Lerner condition. On the other hand, the income elasticities for exports and imports are 0.85 and 1.72 respectively (Berretoni and Castresana, 2009; Zack and Dalle, 2015). The elasticities make it difficult to achieve improvements in the trade balance by simply managing the exchange rate and it would be an ineffective way of trying to reconcile the conflict between economic growth and the balance of payments equilibrium. Since the elasticity of imports is greater than that of exports, it forces the country to grow less than its trading partners in order not to fall into trade deficits.

Multiple studies show in relation to foreign trade that the real exchange rate, as well as its volatility, are not statistically significant macroeconomically on the quantities exported. For example, Bernat (2015: 7) shows that for nine Latin American countries real exchange rate depreciations has limited impact. In a study of Argentina in the 1990s for the ILO the real exchange rate is not significant in the regressions to explain the behavior of imports (Damill et al., 2002: 38-39). Finally, Pacheco López (2009) makes estimates of variations in imports in relation to the real exchange rate in the framework of mitigating the trade balance deficit and concludes that, in general, for the countries analyzed in Latin America and Argentina, in particular, "it is not an effective instrument to adjust the balance of payments, at least to curb imports" (Ibid: 32).

If we do a regression on the income elasticity of imports over the period 1997.2-2017.4, the following equation can be considered:

$$m = c + a\,p + b\frac{c}{p} + d\frac{i}{p} \qquad (9)$$

Where m are imports, p the product, c private consumption, i private investment. Since the original variables have unit roots, their logarithms have been differentiated. By using the principal components method with the macroeconomic variables for the period, it is found that both consumption and investment are the ones that best explain the variability of imports. It is possible to propose an equation for the entire period 1997.2-2017.4, controlling the composition effect with the participation of consumption and private investment on income:

$$m = -0.002 + 1.77\,p + 0.67\frac{c}{p} + 0.78\frac{i}{p} \qquad (10)$$

We divide it into three sub-periods avoiding incorporating the years of sudden devaluation changes and then compare the income-elasticity values of each period. A first period until the crisis of 2001, (1997.2-2000.4), a second period until the international crisis of 2009, (2002.1-2008.4) and a third period until the end, (2010.1-2017.4). Elasticities are 1.6, 2.3 and 1.2 respectively for each period (Table 1).

Table 1: Income elasticities

	Período	c	p	c/p	i/p
1	1997.2-2000.4	0.0006	1.6449	0.3253	1.2827
2	2002.1-2008.4	-0.0184	2.2935	0.668304	1.337
3	2010.1-2017.4	0.0058	1.2174	0.8821	0.2329

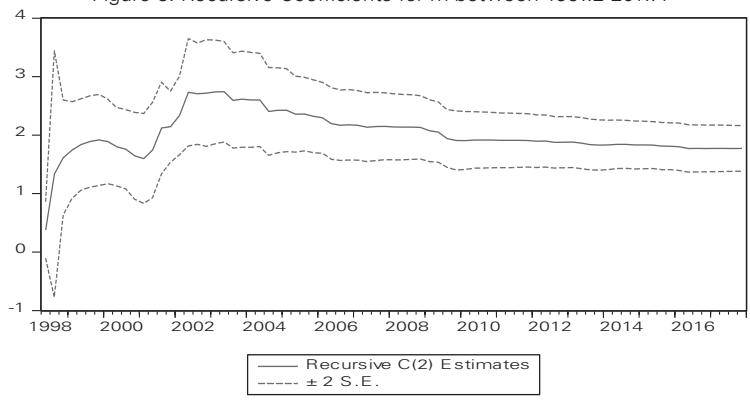
It is observed that the oscillation in the income elasticity (1.6, 2.3 and 1.2), occurs with a continuous appreciation of the real exchange rate (grey line in Figure 4). Also indicating that the results of greater or lesser import penetration or changes in import substitution coefficients do not have a systematic relationship with the

post-Convertibility real exchange rate. This casts doubts on the importance that a more depreciated real exchange rate, perhaps at the level of the equilibrium industrial exchange rate, would have for the local industrial sector.

The coefficients are rather affected by commercial policies, and of promotion in sum of policies that modify income such as autonomous spending. The elasticity-consumption coefficient (c/p) increases while the investment coefficient (i/p) falls towards the third period. In the regressions, the data on the real exchange rate are not significant, so the labor intensity, macroeconomic and development channels do not work as predicted in Frenkel (2004).[6] Possible explanations for this inelasticity can be found in the problems of conventional factor substitution assumptions for the first two channels and the problems of assuming export or profit-led economies for the third channel. This last channel considers a relationship between the variations in the real exchange rate and investments in a positive way, since a devaluation increases the profit rate.

In short, these results allow us to understand that for the analyzed period of 20 years (March 1997 to September 2017) the exchange rate did not have significant influence on the exportable balance in Argentina. It can be seen in Figure 5, that except for the oscillation produced by the 2001 crisis, the income elasticity coefficient of imports remained stable with a downward trend and without major changes in the presence of the subprime crisis and a continuous exchange rate appreciation. Using recursive regression coefficients, the following graph is obtained for the entire period.

Figure 5: Recursive Coefficients for *m* between 1997.2-2017.4



On the profit-led channel we have done some regressions showing that investment follows the accelerator and are not affected by profits. Following Chenery (1952), we use the share of investment over output as the dependent variable and

[6] See also Fiorito et al. (2015).

autonomous demand as the independent variable, according to the flexible accelerator theory. We analyze a relatively long period, between 1930-2020. It is observed that the rate of change of real private investment (I/GDP) and real autonomous demand (z) have common patterns with important changes in 1990 and 2002. Of course, private investment has normally a greater volatility than autonomous demand for the entire analysis period.[7]

The unit roots and structural breaks are tested for the period 1930-2020. For private investment, a period of higher values is observed between 1960 and 1982, with possible structural breaks in those two years. In a first step in the study of the series, we seek to check their stationarity, due to the possibility of having a spurious regression.[8] The theoretical link between these two variables that starts from the principle of adjustment of the capital stock to expected demand. Based on this principle, given the technology, firms want to install a capital stock that provides a productive capacity in order to meet the normal expected levels of effective demand throughout the useful life of the equipment with a certain slack of planned idle capacity. This helps to meet temporary peaks in demand and/or unexpected increases in the trend of effective demand. The desired capital stock will then be given by the expected effective demand and by the technical relationship capital-potential product that says how much capital is necessary to obtain a unit of normal potential product" (Serrano, 2006: 2).[9]

In order to evaluate the existence of a potential long-term relationship between the variables, two different tests were used, namely: the Augmented Dickey-Fuller test and the Phillips-Perron test. The augmented Dickey-Fuller ADF test, which is based on the estimation of the following equation, will be used for the detection of unit roots:

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[7] For investment we use the series of investment in durable production equipment in Ferreres (2010) was chosen with an annual frequency for the period (1930-2009) and at constant 1993 prices, as well as the autonomous expenditure made up of the sum public consumption, exports and construction. The rest of the years up to 2020 were completed with data from the Ministry of Finance.

[8] According to Granger and Newbold (1974), regressions between two variables are spurious if they show the following characteristics: 1) they do not maintain a causal relationship with each other; and 2) that the estimation of a temporary econometric model, which relates one of them to the other, provides a high R squared and a very low value of the Durbin-Watson statistic, which would correspond to the absence of autocorrelation. It depends on the results about its stationarity that a model is well specified. However, no mechanical result can be expected from this, as many cases are possible.

[9] Formally this is expressed in the equation $h^* = \frac{(z+\delta)v}{u^*}$. With h the marginal propensity to invest that links the expected growth of demand g_t^e and with the propensity to invest or proportion in the product $\frac{I}{Y}$ from the changes in the growth of the expected effective demand. with normal use μ = 1and from the technological changes that affect the capital product ratio v as from its depreciation. See Freitas and Dweck (2010). With another equational specification such as the equation, $\dot{h}_t = h_t\beta(u_t - \mu)$ used by Freitas and Serrano (2014) and Serrano, Freitas and Behring, (2017), the dynamic acts indirectly through variations in capacity utilization with β, as adjustment parameter of the model. Indeed, it is found that there would be no differences with the previous model, while the long-term results for the equation, $h^* = \frac{(z+\delta)v}{u^*}$, also show a positive link between z, the growth rate, and h, the investment rate. See Braga (2018). It should be considered that the Cambridge growth model, retains this link between the rate of investment and output, although with opposite causality. See Avancini, et al (2015: 4).

$$\Delta Y_t = \alpha Y_{t-1} + \beta_i X_{i,t} \sum_{i=1}^{p} \delta_i \Delta Y_t + \varepsilon_t \qquad (11)$$

Where the hypotheses to be tested are: Ho: $\alpha = 0$ H1: $\alpha < 0$ With exogenous regressors$X_{i,t}$ (eg constant and trend), and parameters to be estimated as α,β,δ. Table 1 shows that the analysis of the existence of unit roots by the augmented Dickey-Fuller test does not have the same degree of integration.

Table 2: Dickey-Fuller Augmented

Variable	Muestra	Niveles	p-value	Muestra	Diferencias	p-value
	Estadistico ADF			*Estadistico ADF*		
z	1931-2020	-2.423.919	0.3650	1932-2009	-7.971.602	0,00
I/Y	1932-2020	-3.727.048	0.0255			
ADF valores criticos : -4,1, -3,48 y -3,17						

From the OLS regression, endogenous tests are performed in the global test of structural breaks of Bai and Perron (2003) to find endogenous structural breaks in OLS regression between I/Y and variation of z obtaining a structural break in 1960.[10] This break implies the need, in both the VEC and OLS models, the incorporation of a dummy variable that represents that break in the relationship.[11] Subsequently, the dummy variables for those years of breaks are used to show in an OLS correlation, the low coefficient of the investment rate in response to 1 percentage point of variation in the growth of the product corresponding to the investment accelerator. An OLS regression between I/Y and g_z was performed with the dummy in 1960, which represents the positive structural change that occurs in that year and that changes from there until the end of the sample. The equation and the results are given by:

$$\frac{I}{Y} = c + g_z + D60 + (\frac{I}{Y})_{-1} \qquad (12)$$

$$\frac{I}{Y} = 0.003 + 0.031 g_z + 0.023 + 0.933(\frac{I}{Y})_{-1} \qquad (13)$$

As in Braga (2018), a small coefficient of adaptation to autonomous demand (0.031) is also observed in this regression, which theoretically expresses the flexible

[10] The Bai-Perron methodology can be separated into two separate and independent parts. First, any number of breaks in a time series can be identified, regardless of statistical significance. Second, once the breaks have been identified, BP proposes a series of statistics to test the statistical significance of these breaks, using asymptotic critical values. The economic explanation of the break is related to the arrival in the country in the Frondizi government of economic groups and multinationals that give a positive exogenous shock in investment. Results in the Appendix.

[11] The other break is the one for 2007 that was not added so as not to remove degrees of freedom from the regression.

accelerator (Serrano, 1995). Indeed, the delay in investing on the part of the investor who, only on average, succeeds in increasing the investment and therefore modifying the degree of capacity utilization around a band that fluctuates little. The simple regression results show that the exercise supports the flexible adjustment mechanism hypothesis, in which the investment slowly adjusts to autonomous demand.

The implications of these two econometric exercises are far reaching in our evaluation of the effects of a relatively depreciated or high exchange rate in the Argentine experience. On the one hand, the lack of evidence about the price elasticities of exports and imports, and the importance of the income elasticities, suggests that the substitution principle is not operative in the case of Argentina. It is the size of the market that matters for the expansion of imports, and the expansion of exports depends fundamentally on the growing global economy, and the terms of trade, which affect some key prices of Argentine exports. Furthermore, the inverse relation between the real exchange rate and real wages, suggests that the tradeoff is not between a depreciated exchange rate for growth and an appreciated one for price stability. In the case of Argentina, the depreciated or high exchange rate might be instrumental to bring the real wage down, and to reduce the bargaining power of the working class, and it might be orthogonal to the competitiveness of the Argentine exporting sector, and for alleviating the external constraint. This has also implications for the New Developmentalist preoccupation with a high or depreciated level for the real exchange rate.

A depreciated real exchange rate above the industrial equilibrium exchange rate, something that was present in the Argentine case in the 2002-2005 interval, cannot fully explain the performance of the economy in that period. It is undeniable that a high exchange rate would make some sectors competitive at international prices, in particular a few in the manufacturing sector. However, these did not have a significant impact on the external accounts. At the same time, the exchange rate did not have an impact in the reduction of imports, which depends strongly on the recovery of the domestic economy. The evidence of the accelerator indicates, in the same vein, that a depreciated exchange rate, and the consequent lower real wages, did not stimulate profits and investment, which very much depends on the recovery of domestic demand.

FINAL REFLECTIONS

The exchange rate is a crucial distributive variable, and a long tradition harking back to classical political economy suggested that income distribution had a complex and ambiguous relation with processes of economic accumulation and growth. The marginalist or neoclassical tradition suggests a more direct relation between exchange rates and growth, in which the latter is seen as central for the efficient allocation of resources, and for the determination of external competitiveness.

The Classical Developmentalists or the Old Structuralist authors tended to be closer to the surplus approach tradition in their skepticism about the effects of

exchange rates as allocators of resources. More recently, New Developmentalists have tried to show that a more depreciated level of the real exchange rate would be a necessary condition for the process of economic growth in peripheral economies, in what are essentially demand-led growth models. The current paper provides a model in which exchange rates are thought as distributive variables and provides some evidence about the role of exchange rates in the process of accumulation in Argentina. It is suggested that the Classical Developmentalist skepticism seems to apply to the Argentine case.

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APPENDIX

The tables below show the econometric results for the accelerator equations in the main text of the paper.

Table 3: Bai Perron test

Multiple breakpoint tests
Bai-Perron tests of L+1 vs. L sequentially determined breaks
Sample: 1930 2020
Included observations: 90
Breaking variables: C I_P(-1) GZ
Break test options: Trimming 0.15, Max. breaks 5, Sig. level 0.05
Sequential F-statistic determined breaks: 2

Break Test	F-statistic	Scaled F-statistic	Critical Value**
0 vs. 1 *	11,24	33,72	13.98
1 vs. 2 *	6,75	20,25	15.72
2 vs. 3	3,92	11,75	16.83

* Significant at the 0.05 level.
** Bai-Perron (Econometric Journal, 2003) critical values.

Break dates:

	Sequential	Repartition
1	2007	1960
2	1960	2008

Table 4: Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	3.766479	Prob. F(2,84)	0.0271
Obs*R-squared	7.406799	Prob. Chi-Square(2)	0.0246

Table 5: Heteroscedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	5.868900	Prob. F(3,86)	0.0011
Obs*R-squared	15.29441	Prob. Chi-Square(3)	0.0016
Scaled explained SS	19.90417	Prob. Chi-Square(3)	0.0002

Heteroskedasticity Test: ARCH			
F-statistic	7.730082	Prob. F(1,87)	0.0067
Obs*R-squared	7.262501	Prob. Chi-Square(1)	0.0070

Table 6: OLS regression with dummy variable 1960

Dependent Variable: I_P
Method: Least Squares
Date: 09/05/21 Time: 19:46
Sample (adjusted): 1931 2020
Included observations: 90 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003382	0.002697	1.253967	0.2133
I_P(-1)	0.933473	0.039702	23.51178	0.0000
GZ	0.031216	0.012461	2.505045	0.0141
D60	0.023485	0.010404	2.257244	0.0265

R-squared	0.867725	Mean dependent var	0.062105
Adjusted R-squared	0.863111	S.D. dependent var	0.027608
S.E. of regression	0.010214	Akaike info criterion	-6.286602
Sum squared resid	0.008973	Schwarz criterion	-6.175499
Log likelihood	286.8971	Hannan-Quinn criter.	-6.241799
F-statistic	188.0534	Durbin-Watson stat	1.915864
Prob(F-statistic)	0.000000		