

STOCK-FLOW CONSISTENT (SFC) AS A SUITABLE APPROACH TO MODELING THE NEW DEVELOPMENTALIST FRAMEWORK

Julio Fernando Costa Santos

Universidade Federal de Uberlândia, MG, Brasil

Email: julio.costa@ufu.br

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ABSTRACT

This paper explores the theoretical bases of New Developmentalism, highlighting its core propositions. Evaluates the first effort of mathematical proposition of a New Developmentalist prototype model. It explores how the integration of the current model with a version using the Stock-Flow Consistent approach would look like and how this methodology could help to solve some gaps left behind. Finally, a projection for a new research agenda using sectoral and microeconomic details is pointed out as a possible work front.

KEYWORDS: Economic Development; Macrodinamic Models; Structural Change; Stock-Flow Consistent.

1. INTRODUCTION

Over the last few decades, a group of researchers led by Luiz Carlos Bresser-Pereira has dedicated their time to building a new school of economic thought called the New-Developmentalist (ND). Although ND ideas are widespread in previous works dating from the 2000s, internationally known versions of disclosure can be found in Bresser-Pereira (2016, 2018, 2020).

For the authors of this school of economic thought (Bresser-Pereira, 2006), what distinguishes ND from Classical Developmentalism (DC) are two intervening variables in the middle of this century: on the one hand, the new historical facts that changed the framework of world capitalism, which moved from the golden years to the phase of globalization; on the other hand, middle-income countries such as Brazil have changed their own stage of development, no longer being characterized by infant industries.

According to the author (Bresser-Pereira, 2006), “the main change at the international level was that of capitalism from the golden years or the glorious years (1945-75), in which the welfare state was set up and, at the macroeconomic level, Keynesianism was dominant, while the “economic theory of development” (of Lew-

is, Nurkse, Furtado, Prebisch and Myrdal) predominated at the level of economic development, for the neoliberal capitalism of globalization, in which growth rates are smaller, and competition between nation-states much fiercer.

Thus, the main rupture in the ND is that while the CD thought of a development policy aimed at protecting infant industry, the ND is not protectionist. It is conceived as a strategy for the development of middle-income economies with mature industries in which their industrial sectors can be competitive. For this, the use of the real exchange rate becomes a very important macroeconomic variable, as it has an impact on the prices of this international market competition.

Nevertheless, the ND rejects ideas about growth based only on demand and public deficit. Its theoretical bases are in Keynesian macroeconomic theory and economic development theory, which in turn is based mainly on classical economic theory. It is indisputable that Keynes highlighted the importance of aggregate demand and legitimized fiscal deficits in periods of recession. However, in his propositions, the defense of chronic deficits was never present. The idea is that a balanced national economy, in fiscal terms, could, in the short term, go out of balance to restore the level of employment. It is on this premise that one of the pillars of ND is based.

These and other bases consolidate what would be the ND development propositions. In the next section, the core of theoretical ideas will be highlighted. In the third section, we will show the first effort of mathematical formalization of the model, going into the detail of explaining each macrodynamic channel developed. In the fourth section, we briefly present the Stock-Flow Consistent approach and how it can help advance ND studies and propositions. Finally, in the fifth section, we present the conclusions of the work.

2. THE NEW DEVELOPMENTALISM (ND) IDEAS AND ITS CORE PROPOSITIONS

What is New Developmentalism (ND)? In the words of Bresser-Pereira (2020), ND is a new theory to explain/develop economic growth for middle-income countries and takes as a starting point elements of Keynesian/Post-Keynesian theory and Classical Developmentalism (or Latin American Structuralism).

Although there is a wide literature and discussion about what forms the theoretical body of the propositions of New Developmentalism, we will here list its core of ideas that have been used in the prototype ND model of Oreiro, Da Silva and Dávila-Fernández (2020), as well as in the recent discussion between Bresser (2020) and Medeiros (2020).

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The four main elements that we highlight are: (a) Dutch Disease Problem; (b) Growth with foreign saving problem; (c) Developing an internationally competitive technologically advanced manufacturing sector; (d) Getting macroeconomic prices right.

Regarding the first element, we can mention Palley (2021):

Dutch disease refers to the problem caused by discovery of natural resources which generate both large capital inflows to develop them and large trade surpluses, thereby appreciating the exchange rate and making the industrial sector internationally uncompetitive. It is named after the experience of The Netherlands in the 1960s following the discovery of large off-shore natural gas deposits. The problem of Dutch disease can be analyzed in terms of a two-sector economy consisting of a primary goods sector that produces commodities and an industrial goods sector. The primary goods sector is assumed to have globally low costs of production and to be hyper-competitive in the global economy.

Thus, for the ND theory, there is a link between countries that have relative abundance in their natural resources, which provides a mechanism for exchange appreciation, either through the surpluses of this primary-exporting sector or through the inflow of capital that arises as a result of the former.

Although the theory is intended for the set of middle-income countries and some critical authors [see Palley (2021)] evaluate the theory citing Brazil as an example of the lack of empirical evidence for the theory, we emphasize here that there are recent empirical evidence pointing to a causal link between the commodity price cycle and the effect on the Brazilian exchange rate [see Veríssimo and Xavier (2013); Souza, Mattos and Lima (2020)].

Next, we have as the second element of the theoretical propositions' core: "Growth with foreign saving problem". Regarding this point, we quote the description by Palley (2021):

The significance of CA [current account] deficits is they add to foreign debt. That imposes a debt service burden and can also lead to financial crisis. Such crises cause a sudden stop to growth which can endure for years. That pattern aggravates the development problem posed by Dutch disease. Now, the development of the industrial sector is undercut by Dutch disease induced structural over-valuation of the exchange rate, and it is also undercut by boom-bust exchange rate cycles and enduring slumps resulting from the damage done by financial crisis.

As highlighted above, this second element of the core of propositions is directly related to the former. Due to the effect of the originating Dutch disease, we have the unfeasibility of the competitive manufacturing sector, through the resulting appreciation of the real exchange rate. In view of this, the exports composition tends to have

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a high share in commodities goods and a low share in industrialized goods. Considering that in a small and open country the only autonomous component of demand in the long run is exports (or quasi-autonomous), a link between this component and the price of commodities can generate “stop and go” cycles in GDP in that economy, which is undesirable for a process of economic development and catching-up.

Next, we have the third main element of the ND Theory which is “Developing an internationally competitive technologically advanced manufacturing sector”. What is observed here is the heterodox inspiration of considering the manufacturing sector as essential for economic growth. To understand this point, we can quote Oreiro and Feijó (2010):

The different currents of heterodox thinking, however, consider the process of economic growth to be sector-specific. More precisely, heterodox economists believe that industry is the engine of long-term growth in capitalist economies (Thirlwall, 2002; Tregenna, 2009), since: (i) production are stronger in industry than in other sectors of the economy. (ii) Industry is characterized by the presence of static and dynamic economies of scale, such that productivity in industry is an increasing function of industrial production. This phenomenon is known in the economic literature as the “Kaldor-Verdoorn law”; (iii) Most technological change takes place in the industry. Furthermore, much of the technological progress that occurs in the rest of the economy is diffused from the manufacturing sector; (iv) The income elasticity of imports of manufactures is greater than the income elasticity of imports of commodities and primary products. Thus, “industrialization” is seen as necessary to relax the balance of payments constraint on long-term growth. In short, the industry is seen as “special” by heterodox thinking, as it is the source of increasing returns to scale (indispensable for sustaining long-term growth), it is the source and/or the main diffuser of technological progress and allows the relaxation of the external constraint on long-term growth. [our translation].

Thus, the most important treatment given to the manufacturing industry is connected with the two previous points. In the first element, we have those countries that naturally suffer from the pathology of the Dutch disease, have as a direct effect a tendency to appreciate the real exchange rate above the level that makes the industrial sector internationally competitive.

Regarding the connection with the second element, namely growth with foreign savings, we have that this arrangement of an appreciated real exchange rate structure due to the Dutch disease, the manufacturing industry with a low share in domestic production, the problem of the difference between the Sectoral income elasticities (low-income elasticity in commodity-linked sectors and high-income elasticity in sophisticated and industrial sectors) lead to current account deficits. The economy with this productive structure in moments of commodity boom re-

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laxes the external constraint, so it may have surpluses during the expansion of the cycle, but deficits reappear when the cycle ends. Thus, the external constraint comes into play. Therefore, there is a dependence of the economic cycle on the commodity cycle.

However, as a result of the chronic tendency for the economy to run into current account deficits, the need for financing via foreign savings arises. It so happens that external financing can have a high share of short-term speculative capital in its composition. Therefore, we add to the financing of this supply side the effect of international financial cycles, providing greater vulnerability, which is undesirable within the planning of economic growth.

Finally, we have the fourth element which is “Getting macroeconomic prices right”. To understand what the above statement consists of, we need to understand what the macroeconomic prices mentioned are. In the words of Bresser-Pereira (2016): “New Developmentalism works with five macroeconomic prices: The *profit rate*, the *exchange rate*, the *interest rate*, the *wage rate*, and the *inflation rate*, and understands that they must be kept right”.

In this way, we can see that there is a concern to create an adequate macroeconomic alignment. The idea is that right macroeconomic prices are supposed to ensure a macroeconomic context that ensconces and facilitates ND’s other policies, thereby promoting stable growth.

Thus, although there are criticisms of the last element for the abstraction of what would be the correct place for these economic prices (see Palley (2020) and Medeiros (2020)), we can understand this last point as something more generic and a good discussion about the appropriate level is the subject of a research agenda that is still open and can be better discussed based on empirical tests and macrodynamic models that may be calibrated specifically for a given middle-income economy.

3. THE ND AS A MACRODYNAMIC MODEL AND THE STOCK-FLOW CONSISTENT (SFC) APPROACH

3.1 The ND as a Long run growth Model

The core propositions of the ND policy framework were presented in the previous section. Although the ND theoretical bases were already being consolidated in Bresser-Pereira (2016, 2018, 2020a) and Bresser-Pereira, Oreiro and Marconi (2014 and 2015), we only had the first effort to formalize the ideas into a macrodynamic model in the paper of Oreiro, da Silva and Dávila-Fernández (2020). So

here we will try to list some points that the formal model shows and later we will create a connection with the SFC literature.

On the supply side, the model uses the Leontief production function. In the heterodox tradition, namely the classical-Marxist and the post-Keynesian, there is a rejection of the validity of the neoclassical production function and its possible factors substitution effect between capital and labor. This specification assumes that there are infinite possibilities of substitution of the production technique for a given technology¹.

Thus, the authors assuming a Leontief production function uses the following form:

$$p.Y = \min\left\{\frac{u.p.K}{\vartheta}, e.N.p.y\right\} \quad (1)$$

where Y is the real output; p is the price level, u is the actual capacity utilization, K is the real capital stock, ϑ is the unit capital requirement per output (or its optimal ratio), and e is the labor-output share, N is number of the people engaged in the workforce, y the labor productivity.

As can be seen, there is a minimum requirement between the capital stock and the labor force. As a result of the choice of this production function, we have that the following equality is established: $p.Y = \frac{u.p.K}{\vartheta} = e.N.p.y$. By applying the natural logarithm and differentiating with respect to time, we have:

$$\frac{\dot{e}}{e} = \frac{\dot{Y}}{Y} - \frac{\dot{y}}{y} - n \quad (2)$$

Where the dot over the state variable denotes the time derivative.

To keep the growth rate of labor's share of GDP constant, we must have the equality between the growth rate of real GDP and the sum of the growth rate of labor productivity and the rate of population growth.

In the short term, the capacity utilization is the adjustment variable, following the Kaleckian tradition. Mathematically it is expressed by:

$$\frac{\dot{u}}{u} = \frac{\dot{Y}}{Y} = \frac{\dot{K}}{K} \quad (3)$$

Thus, the capacity utilization growth rate adjusts to the difference between the growth rate of real output and the growth rate of the capital stock. Regarding the first term, \dot{Y}/Y , we have:

$$\frac{\dot{Y}}{Y} = \frac{\dot{X}}{X} + \frac{\dot{h} + m \cdot \dot{q}}{s + q \cdot m - h} \quad (4)$$

¹ More details in Blecker and Setterfield (section 1.3.2, 2019).

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Where \bar{X} is the level of real exports, \bar{h} is the marginal propensity to invest, \bar{m} is the imports-output ratio, \bar{q} is the real exchange rate, \bar{s} is the marginal propensity to save.

Which leads to a direct interpretation that an increase in the growth rate of exports or a devaluation of the real exchange rate generates acceleration of real output growth². Regarding the growth rate of exports, we still have that:

$$\frac{\dot{X}}{X} = x_0 + x_1 \cdot \gamma \quad (5)$$

Where x_0 is the autonomous component of exports; γ is the share of the manufacturing industry in real output and x_1 is the exports' sensitivity to structural change.

In short, although there are oscillations in the current capacity utilization in the short term due to its characteristic of being an adjustment variable, in the long term it is determined by the normal (or desired) degree of use by entrepreneurs, in the form of adjustment via the Supermultiplier (Dejuan (2013), Serrano and Freitas (2015)). It so happens that in terms of autonomous demand components, the only one that exists is the autonomous component of exports (since the model aims to reproduce a small and open economy). The other components of effective demand are induced by household income³.

Regarding the structural change (in terms of the share of the manufacturing industry in output), we have:

$$\dot{\gamma} = \beta_0 + \beta_1 \cdot q - \beta_2 \cdot Gap \quad (6)$$

Where $\beta_0 < 0$ captures the effect of a deindustrialization process that occurs in mature economies, which could be described as the effect of rising incomes causing the stabilization of the demand for manufactured goods, $\beta_1 > 0$ captures the effect of discretionary development policies industrial sector from the management of the real exchange rate, $\beta_2 > 0$ corresponds to the sensitivity of the productive structure to the technological gap. Parameter β_1 implicitly captures

2 In the original version of the article, the equation is different from this one. We found that there was a lack of exchange rate effect in this growth channel. However, the incorporation of this effect does not generate major changes in the final result of the model, nor in its interpretation.

3 Although it is easily accepted that autonomous components of domestic demand can be drivers of growth in the short run (traditional Keynesian theory), the same argument cannot be easily extended to the long run. Part of this critique can be found in Skott, Santos and Oreiro (2020), Nikiforos (2013, 2018) and Oreiro and Santos (2021). For the condition of a small and open economy, the only element that could be indicated as autonomous in the long run is exports.

the trade-tariffs on the manufacturing sector. A high level of tariffs reduces the response of $\bar{\gamma}$ to the real exchange rate, due to the lower possibility of substitution between domestic goods and foreign goods.

Using equation (6), the exchange rate that guarantees a constant share of manufacturing, \bar{q}^I , is defined as: $0 = \beta_0 + \beta_1 \cdot q - \beta_2 \cdot Gap$, so, we have: $\bar{q}^I = \frac{1}{\beta_1}(-\beta_0 + \beta_2 \cdot Gap)$.

The level of the industrial equilibrium exchange rate is an increasing function of the technology gap. Although a deeper discussion of the Gap dynamics is beyond the scope of that model, it is important to note that the greater the distance of the developing country from the technological frontier, the greater the real exchange rate required to keep $\bar{\gamma}$ constant over time. It should also be noted that \bar{q}^I is a negative function for tariffs, captured by β_1 .

Regarding pricing decisions and the income functional distribution, we have an economy divided into two classes (workers and capitalists), without rentier class and/or banking system. Price setting follows the kaleckian tradition, being:

$$p = (1 + z) \cdot \frac{w}{y} \tag{7}$$

Where \bar{z} is the mark-up over the unit cost and \bar{w} is the nominal wages.

The mark-up is a function of the real exchange rate, due to the effect of imperfect competition with imported goods. In fact, here we have an economy with homogeneous goods in which imported goods are imperfect substitutes for local goods, mathematically the effect on the mark-up can be represented by:

$$z = \xi_0 + \xi_1 \cdot q \tag{8}$$

That said, the inflation rate is given by⁴:

$$\pi = \frac{\dot{w}}{w} - \frac{\dot{y}}{y} \tag{9}$$

Equation (9) above shows that inflation is the difference between the growth rate of nominal wages and the growth rate of labor productivity. That said, let's see what feeds the two components:

4 The authors disregard from the inflation equation the effect of mark-up inflation, which mathematically joining the terms could be expressed by: $\pi = \frac{\dot{z}}{1+z} + \frac{\dot{w}}{w} - \frac{\dot{y}}{y}$.

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$$\frac{\dot{w}}{w} = \epsilon_1 \cdot \pi^e + \epsilon_2 \cdot (\bar{\omega} - \omega) + (1 - \epsilon_1 - \epsilon_2) \cdot e \quad (10)$$

Where ϵ_1 is the sensitivity of actual wage inflation to the unions' expected inflation, π^e ; ϵ_2 is the sensitivity of actual wage inflation to the difference between the desired and actual wage share, $(\bar{\omega} - \omega)$; the residual parameter, $(1 - \epsilon_1 - \epsilon_2)$, captures the effect of labor participation on production, e .

The equation (10) above shows that wage inflation is fed by agents' expectations (which perhaps justifies the argument of using macroeconomic prices in the right place to anchor unions' expectations), by distributive conflict (although it is not in the model, here there is room for discussion about the social agreement between classes so that during the growth process it is possible to deal with lower wage share so that higher values can be reached with productivity growth). Still on the distributive conflict, the markup component reacts positively to the devaluation of the real exchange rate. The idea is that we are dealing with a homogeneous goods economy in which there is imperfect competition between the domestic good and the foreign good. Therefore, there is no long-term validity of the PPP. However, the price of imported goods influences price marking internally. By influencing the price decision, there is a markup on the rate of profit, which in turn marks the share of wages in income.

Regarding the growth rate of labor productivity, we have:

$$\frac{\dot{y}}{y} = \alpha_0 + \alpha_1 \cdot \gamma \cdot \left(\frac{\dot{K}}{K} - \frac{\dot{L}}{L} \right) + \alpha_2 \cdot e \quad (11)$$

Where \dot{y}/y defines the growth rate of labor productivity, α_0 defines the long-term trend of labor productivity growth; α_1 captures the economy's ability to increase productivity through the purchase of new machinery and equipment, since there are technical and technological changes in them; γ is the share of industry in output; α_2 captures the labor structural change.

The central element of the structural change in the model is given by the growth rate of industrial share. Mathematically it is expressed by $\dot{\gamma}/\gamma = \beta_0 + \beta_1 \cdot q - \beta_2 \cdot Gap$. In general terms, it has an intercept $\beta_0 < 0$, showing the effect of the deindustrialization trend; a $\beta_1 > 0$ component that captures the exchange rate policy, reacting positively to the devaluation of the real exchange rate and finally a β_2 that captures the effect of the productive structure on the technological gap. This same equation, set to zero, provides the industrial equilibrium exchange rate, that is, the one that guarantees the constant share of manufacturing in GDP over time.

Regarding the Balance of Payments, growth with foreign savings and the Dutch disease, the model presents the following equations:

$$d = \phi_0 - \phi_1 \cdot q \quad (12)$$

Where d is the ratio of the current account deficit to real output, ϕ_0 captures all components other than the exchange rate that matter to determine the deficit being greater than zero. On the parameter $\phi_1 > 0$, it is assumed that the relationship closely follows the Marshall-Lerner condition.

A more depreciated exchange rate causes an increase in net exports, reducing the current account deficit. The exchange rate compatible with zero current account deficit, $d = 0$, is defined as $q^{CAB} = \phi_0 / \phi_1$.

The Dutch disease occurs when $q^I > q^{CAB}$. As $q^I = 1 / \beta_1 (-\beta_0 + \beta_2 \cdot Gap)$, we can determine the threshold value of the technology gap, Gap^T , above which an economy should fall in the following situation $Gap^T = (\beta_1 / \beta_2) \cdot (q^{CAB} + \beta_0 / \beta_1)$. Note that the greater sensitivity of manufacturing activities to the gap, β_2 , the easier it will be to have Dutch disease. More than that, this process interacts with the determinants of q^{CAB} . A strong current account deficit response, ϕ_1 , has a similar effect, highlighting the link between the balance of payments and the productive structure.

An economy adopting the strategy of using foreign savings follows a target for the ratio of current account to output, $\bar{d} > 0$. We can rewrite equation (12) as:

$$\bar{q} = q^{CAB} - \frac{\bar{d}}{\phi_1} \quad (13)$$

Where \bar{q} can be called a target for the exchange rate compatible with the use of foreign savings. Any attempt to grow using foreign savings will produce an exchange rate overvaluation relative to the current account equilibrium level, \bar{d} / ϕ_1 .

On the capital account side, its ratio to GDP can be formulated as:

$$ca = \psi \cdot (i - i^f - \rho) \quad (14)$$

Where ca is the capital account output ratio, i is the domestic interest rate, i^f is the international interest rate, ρ is the risk premium for the domestic country; $\psi > 0$ is the sensitivity of capital flows to the interest rate differential, which mainly depends on the level of capital controls.

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By macroeconomic identity, we have that $\bar{d} = c\alpha$. Therefore, the interest rate is the adjustment variable for growth using foreign savings.

$$i = i^f + \rho + \frac{\bar{d}}{\psi} \quad (15)$$

In order to show that the exchange rate appreciation is the result of the joint effect of the Dutch disease and the growth with foreign savings strategy, we have:

$$\bar{q} - q^I = \underbrace{(q^{CAB} - q^I)}_{\text{Dutch disease}} - \underbrace{(q^{CAB} - \bar{q})}_{\text{External savings strategy}} \quad (16)$$

In short, this is the first formal version of an economic growth model, and therefore a long-term one, that brings together the pieces of the theory originally proposed by Bresser Pereira in a consistent way. To summarize the model dynamics and the variables' connection, we show the next figure 1.

Figure 1 – The ND Model Dynamics

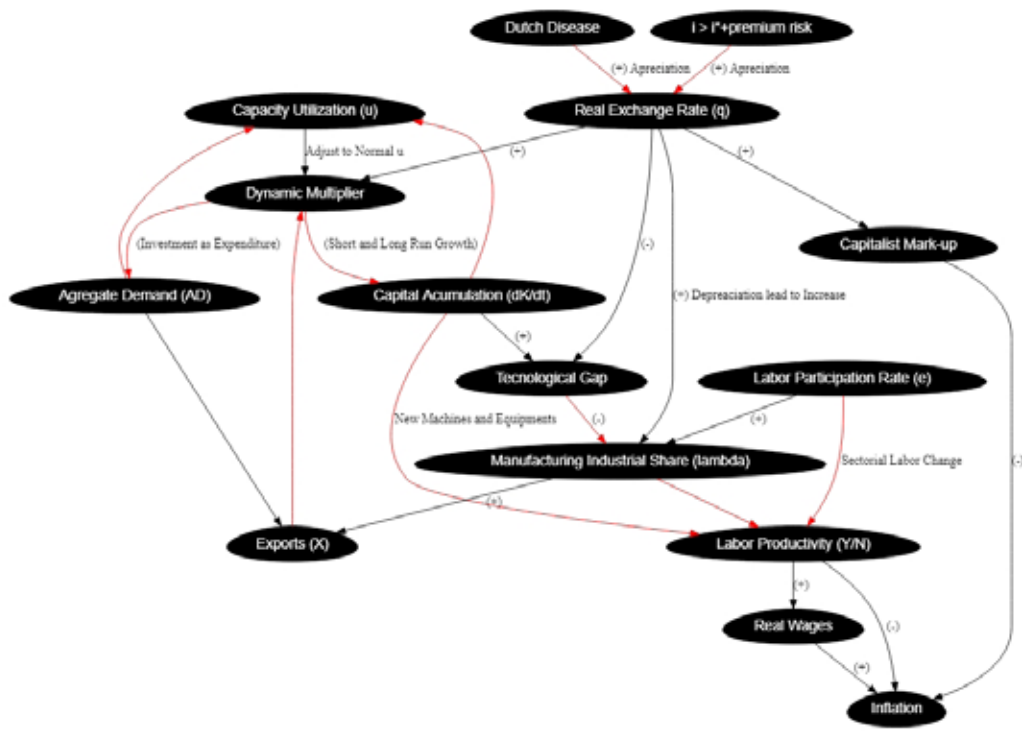


Figure 1 – The ND Model Dynamics
 Source: Author's own elaboration.

Finally, the authors reduce the model dynamics to a system of three nonlinear differential equations, find the fixed points (stationary state of the model) under which the country can grow in the new developmental regime or fall behind into the “medium income trap”. Furthermore, they show under which conditions the model presents local stability using the Routh-Hurwitz criteria and numerically simulate a set of stable paths.

The model design makes a specific choice for formal elegance in its mathematical presentation, resolution and exploration of the system’s properties (local stability). This choice is not without costs/simplifications in modeling and what we will put here in the next subsection is how we could make advances in modeling when using the Stock-Flow Consistent (SFC) approach.

3.2 How could SFC approach help that Discussion?

The SFC approach, although not new, as it was already present in the works of Godley and Trips (1983), Tobin (1980, 1982), gained greater importance in the post-Keynesian (PK) research field in the last two decades. Certainly, the work that spread its use in the PK field was the book *Monetary Economics* by Godley and Lavoie published in 2007.

The primary effort of this approach is to maintain cohesion and consistency between the dynamics of flows and stocks of a capitalist economy. For this approach, the model must be concerned with the “tracking” of money, production and the evolution of wealth. Currency must be added to the agents’ balance sheet as an asset and to its issuer as a liability, using the double-entry principle here. For all expenses, there is a revenue for one agent and an expense for another, so that black holes⁵ do not appear in the system.

On the point mentioned above, it is worth mentioning that the SFC models tracks both the monetary flows from production (GDP, wages, profits, dividends, savings), flows of agents’ portfolio change (capital flows) and the existing stocks of agents (public debt, corporate debt, household debt, government bonds held by the public, bank deposits, etc.). Thus, the discussion that takes place on financing channels is no longer made in terms of internal and external savings flows and is now carried out completely through the Finance-Investment-Saving-Funding (FISF) circuits, taking a closer ‘keynesian view’ on money and on the financial links in the production cycle⁶.

⁵ Name used to refer to flows or stocks that disappear or appear with accounting inconsistency in the model dynamics.

⁶ Term originally used by Paul Davidson (1982 and 1986) and widely discussed in the SFC accounting framework. A prototype of the circuit can be seen in chapter 11 of Godley and Lavoie (2007).

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The SFC approach can also be characterized as a way of modeling involving consistency between flows and stocks and this consistency translates into an n -dimensional system of differential equations or difference equations. It is usual in these models to adopt the resolution via numerical simulation, without necessarily having to deal with closed analytical solutions, local stability analysis and other more formal dynamical systems tools.

Thus, given that the scope of the approach is not an analytical closure of the model, but the achievement of time trajectories that reproduce a modern capitalist economy, there are advantages that arise. The first one is that we can put a “magnifying glass” on the macroeconomic channels that are formed. As the main “policy making” variable in new developmentalism is the real exchange rate, that is, with the goal of devaluing above the industrial equilibrium point, we can investigate the following links in more detail:

- a. The effect of the real exchange rate on firms: Although the ND prototype model points out the link between the exchange rate and the mark-up over unit costs, we can investigate further, for example:
 - In the case of an economy that produces domestic goods and uses imported intermediate inputs, a currency devaluation raises primary costs that can partially or totally deteriorate price competitiveness. (Ribeiro *et al*, 2016). How to reconcile this possible short-term effect with structural change?
 - In the case of firms indebted in foreign currency, a currency devaluation can generate a mismatch between operating income and debt service burden. How to reconcile debt issues with structural change? Would financing channels be needed using the national banking system?
- b. Open the simplification about how ‘policy makers’ can drive the real exchange rate. Devaluations in the nominal exchange have an inflationary impact and this should be an obstacle. Furthermore, one can better discuss the effect of dependence on imported goods and the inflationary aspect of exchange rate policy.
- c. Analyze the causality between the management of fiscal policy, public debt and external constraint. If there is a target for exchange rate policy, how can fiscal policy be reconciled with these targets? How design rules for prudent fiscal policy without running into the problem of twin deficits? These are answers that can certainly be addressed in this approach.
- d. How to neutralize the effect of commodity price fluctuation on the nominal

exchange rate? SFC could help to a better understand about the link between speculative attacks on currency and the use of control measures on short-term capital flows.

- e. Since the model deals with the issue of structural change and this ultimately impacts the growth rate of labor productivity in the tradable goods sector, we need to add the Balassa-Samuelson effect on the real exchange rate, so that, would make it difficult to manage the real exchange rate itself.

Apart from the exchange rate policy impacts, the model can also be used to reconcile other instruments that may be driving structural change in favor of increasing the share of the manufacturing industry. One example is the introduction of the banking sector with industry-oriented financing policies. Another example is the taxation types that occurs distinguishing industrial and non-industrial sectors, in order to deal with the Dutch disease.

Nevertheless, the SFC approach can also help to integrate the short, medium and long run dynamics of the ND. Short-term issues such as fiscal policy and monetary policy can be better described. The public financing can be presented as well as the impact caused by a deficit fiscal policy for the current account deficit of the balance of payments (appearance of the twin deficits as described by Cripps and Godley (1976)).

Finally, an SFC model can expand the discussion of growth using foreign savings for the analysis of the complete open-economy Finance-Investment-Saving-Funding (FISF) circuit. There, in detail, we can verify the bottlenecks of the model and how the financial circuit is important to direct the intended structural change.

6. CONCLUSION

In this paper, we carry out an analysis of the core of new developmentalist propositions and investigate the macrodynamic model proposed by Oreiro, Da Silva and Dávila-Fernandez (2020). The idea was precisely to comment on how this prototype would obtain gains when advancing to a new structure in a Stock-Flow Consistent approach and how some answers to the problems of SFC models can help to solve “puzzles” of the management of the real exchange rate.

That said, some gaps in the original model were pointed out and possible solutions in the SFC approach were described. We believe that this step, in addition to being important for the internal consistency of the model, is also important to answer some theoretical criticisms made by Medeiros (2020) and Palley (2021).

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Thus, although there is a part of the empirical literature in favor of new developmentalist's arguments, we make it clear that there is a wide avenue of research for authors of this school of thought for design the microeconomic level of their model, better elucidate the argument at the sector level, as well as detail the use of instruments other than the exchange rate to effect the intended structural change.

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