A theoretical framework for a Structuralist Development Macroeconomics

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Structuralist development economics was formulated between 1940 and 1960, in the context of great hopes after the II World War, by a group of economists associated to the transition of the League of Nations to the United Nations[1]. Their approach as well as Keynesian macroeconomics were dominant between 1940 and 1960, greatly due to the occurrence of the Great Crash of 1929 and the Great Depression of the 1930 decade, which caused the collapse of economic liberalism and the neoclassical theory which legitimize it. However, from the economic slowdown that occurs in the years 1970, in rich countries, neoliberal ideology returned and neoclassical economic theory that justified it "scientifically" became hegemonic again.

From the beginning of the year 2000, however, after a succession of financial crises, it became clear the failure of neoliberal proposals. They do not guarantee either stability or economic growth or a reasonable distribution of income. On the contrary, it only benefited a restricted minority. From the global financial crisis of 2008, it became also clear to rich countries the failure of neoliberalism. Then, since the beginning of the year 2000, a set of new macroeconomic policies and development strategies that began to be developed that came to be known “new developmentalism”, and a new theory justifying it – “structuralist development macroeconomics” – emerged.[2] In this paper we summarize the new ideas.

Usually economic textbooks treat separately macroeconomics, which is seen as the study of cyclical fluctuations, and economic development, seen as the study of the long-term trend of capitalist economies. However, recent developments in the econometrics of time series had shown that it is incorrect the decomposition of real output behavior in "trend" and "cycle". This is because the time series for the gross domestic product, both for developed and developing countries, present "unit root", so that temporary shocks – in demand or supply – have permanent effects over current output[3]. Thus, the cyclical component of economic activity, traditionally associated with the variations of aggregate demand in the short term, affects the growth trend of capitalist economies in the long term. In this context, the growth trend becomes dependent on the trajectory that capitalist economies effectively described over time. This phenomenon is known in the literature as "path dependence".

The "path dependence" phenomenon has strong implications for macroeconomic theory and policy. In terms of macroeconomic theory, it shows that it is not acceptable the traditional division of macroeconomics between "short term", in which issues related to aggregate demand are relevant, and "long term", where these issues do not have any relevance (Dutt and Ros, 2007, p. 97). This is because what happens in the short term has long-term effects.

It is not therefore reasonable to separate macroeconomics from the theory of economic development. More reasonable is to unite the two areas under the name of *macroeconomics of development*. It is what we will do in this article. But as our vision of economic development is a structuralist vision, what we will introduce here is a *structuralist development macroeconomics* that can be *defined* as follows: is the economic theory that explains economic development as a historical process of capital accumulation with incorporation of technological progress and structural change in which the accumulation depends on the existence of profitable investment opportunities offered by the sustained growth of demand, which, on its turn, depend on the even increase of the domestic market and of exports.

In this setting, if real exchange rate is at the “right level”, that is, in the “industrial equilibrium level” –the level that allows domestic firms operating with technologies at the world state of art to be competitive in international markets –there will be no external constraint to development, which will be limited only by investment rate and capital productivity.

Yet, in developing countries, free markets don’t lead to this exchange rate equilibrium. Instead, they make it chronically overvalued. First, the existence of abundant and cheap natural resources act as an obstacle to economic development, as Ricardian rents that results form the exploration of these resources will produce the permanent over-valuation of exchange rate: the Dutch Disease or the natural resources curse. If such disease ceases to be neutralized then a country that previously was able to industrialize will reduce investment in manufacturing, and will incur into premature deindustrialization and the return to a primary exports model. On the other hand, excessive net capital inflows will lead the economy to current account deficit and to cyclical overvaluation of the exchange rate. Instead of increasing the investment rate, the capital inflows required to finance such deficits involve a high rate of substitution of foreign for domestic savings, as they appreciate the exchange rate. Thus, while the economy goes from currency crisis to currency crisis, consumption rather than investment increase.

Such inflows that unduly appreciate the national currency result from a structural factor: (a) the fact that profit and interest rates tend to be structurally higher in developing countries; and from four policy causes: two following conventional economics: (b) high interest rates to control inflation, and (c) to avoid “financial repression”; one cause common to conventional as well as Keynesian and structuralist economics: (d) to incur in current account deficits to overcome the “foreign constraint”; and one cause derived of domestic politics: (e) exchange rate populism, i.e., the politicians appreciates the currency so as to increase wages and reduce inflation, and be reelected. The combined effects of Dutch disease and excessive capital inflows will result in a path of real output that is lower than the one verified in developed countries. In this case the middle-income country will enter in a falling-behind path[4].

Development pulled by demand.

In an economy that already done its industrial revolution or its capitalist revolution and become a middle-income country, long-term growth is determined by aggregate demand. This is because economic growth does not depend on prior savings or on the availability of means of production, but, unlike conventional economic theory teaches, depends on the existence of profitable investment opportunities and the availability of credit. In a mature capitalist economy, albeit in a developmental stage, the means of production are produced within the system, so that availability of then can never be taken as given. In this context, the rate of creation of productive resources is determined by the rate of expansion of aggregate demand, more specifically, by the expansion of those components of aggregate demand that are autonomous in relation to the level and/or the change of output and income, since it is this expansion that creates opportunities for profitable investments and motivates the capitalists or entrepreneurs to invest.

In a small open economy that does not have a convertible currency[5] as in the case of developing countries; the autonomous component of aggregate demand is constituted by exports. Economic development depends therefore mainly of exports. Domestic consumption cannot lead long-term growth unless wage share income is persistently increasing over time, what is, in principle, incompatible with a satisfactory expected profit rate for entrepreneurs (unless technical progress is of a capital saving type). Another condition for consumption led growth is that consumer debt is growing over time what is also not sustainable. Thus, the existence of limits to the growth of wage share makes it impossible to pull output growth indefinitely through wage increases ahead of productivity growth. An alternative - a growth led by government spending – it is also untenable, because these expenses will sooner or later lead to inflation and to a balance of payments crisis.

From the perspective of structuralist development macroeconomics, the potential growth rate of real output in the long term will be given by the investment rate or the rate of increase in the stock of capital, given the productivity of capital or capital-output ratio. Investment, in turn, depends on the existence of profitable investment opportunities, mainly export-oriented ones. To the extent that the entrepreneurs of developing countries where labor is relatively cheap, go to master technology similar to the one that exists in most advanced countries, they get credit and invest. This will increase the domestic savings and accelerate the rate of economic growth, thereby increasing the country's share in world exports.

Neoclassical growth theory assumes that the availability of production factors and the technology are independent of aggregate demand. But there are strong arguments that point to the fact that economic growth is pulled by aggregate demand. Firstly you need to consider that investment directly depends on demand. A businessman will not invest if he/she does not know that there is demand for the goods and services that he/she wants to produce. Second, by its very nature, investment increases the availability of capital and production capacity. In fact, both the growth rate of the availability of the factors of production as the pace of technological progress are determined, in the long run, by the rate of expansion of aggregate demand.

The structuralist development theory came at the moment when the Keynesian thinking became dominant throughout the world, in such a way that structuralist economists had no doubts about the importance of demand for economic development. Celso Furtado

(1966) in particular was very clear in relation to this issue. Entrepreneurs only invest if they count with good profitable investment opportunities, which depend on demand.

On the other hand, Nicholas Kaldor (1988, p. 157) argued that growth is pulled by demand because the means of production used in a modern capitalist economy are themselves goods that are produced within the system. In this way, the "availability" of means of production can never be considered as a given independent of the demand for the same. In that context, the fundamental economic problem is not the allocation of a given volume of resources among a number of alternatives available, as a neoclassical economists thinks, but determining the pace at which these resources are created. In the words of Mark Setterfield, one of the exponents of this theoretical approach:

> The use of produced means of production implies that the scarcity of resources in processing activities cannot be thought of as being independent of the level of activity in the economy. What is chiefly important in processing activities is the dynamic propensity of the economy to create resources (that is, to deepen and/or widen its stock of capital) rather than the static problem of resource allocation (1997, p. 50).

Availability of Factors

In order to understand the long-run endogeneity of factors of production, we will start with the supply of capital. The quantity of capital that exists in a point of time – or, in other words, the productive capacity that exists in the economy – is the result of past investment decisions. From this line of argument, we can conclude that the stock of capital is not a given quantity determined by "nature", but is dependent of the rate at which entrepreneurs want to increase the stock of capital.

So the fundamental determinant of the "capital stock" is investment decision. Investment, in turn, is determined by two set of variables: i) the opportunity cost of capital (mainly determined by the level of short-term interest rate set by the Central Bank); ii) the expectations about the future growth of sales and production. In this setting, if entrepreneurs expect a strong and sustainable increase in demand for the goods that they produce – as it would be expected in an economy that shows a persistent high growth rate – then they will make large investment expenditures.

It is true that in the short and in the middle run, production should not increase beyond the maximum productive capacity of the economy. In the long-run, however, the productive capacity must be increased – by means of investment expenditures – in order to met the increase in aggregate demand.

A very common objection to this reasoning is the idea that investment needs "previous" saving in order to be realized; that is, any increase in investment expenditure requires a previous increase in the saving rate of the economy. In fact, investment expenditures require only the creation of liquidity by commercial banks (Carvalho, 1992; Davidson, 1968). If commercial banks are ready to increase their credit operations in favorable terms, then it will be possible for firms to start their investment projects, buying new machines and equipment from the capital goods producers. Once the investment expenditure is done, it will be generated an extra income of such magnitude that, at the end of the process, aggregate saving will adjust to the new value of aggregate investment. The extra saving generated in this way should now be used for funding short-term debts with commercial banks in long-term debts in capital markets. More

specifically, firms could sell shares or long-term bonds in capital markets in order to raise the required funds to pay all their debs to commercial banks. These operations will not necessarily decrease the price of bonds or shares since families will be looking for new assets to store their extra saving[6].

There are three sources of funds to finance the investment project of firms: retained earnings, debts and equity. So, the cost of capital is the weighted average of the cost of each of these sources of finance. If the cost of capital is too high – for instance, due a very tight monetary policy that increase the short-term interest rate, increasing the cost of borrowing – than new investment projects may not be profitable, and investment expenditure will not adjust to the level required by the expected growth of aggregate demand.

We will now turn our attention to the "supply of labor". According to our view, the "supply of labor" should not be considered a limit to the growth of production in the long-run. First of all, the number of work hours could be increased easily in order to increase the level of production[7]. Second, the participation rate – defined as the ratio between the labor force and total population in work age – could increase in response to a strong increase in demand for labor (Thirlwall, 2002, p.86). In fact, during boom times, the opportunity cost of leisure increases, stimulating a strong increase in the participation rate. So we can conclude that the growth rate of labor force could accelerate during boom times due to the fact that some people may decide to enter in the labor force as a response to the incentives created by a booming labor market.

Finally, we have to state that population and labor force is not a datum from the view point of the economy as a whole. A shortage of labor – even of qualified workers – can se solved by immigration from other countries. For example, countries as Germany and France could sustain high growth rates during the 1950's and 1960' due to immigration of workers from the countries of the periphery of Europe (Spain, Portugal, Greece, Turkey and south of Italy).

A last element to be considered is technological progress. Is it possible to consider the rate of technological progress a restriction to long-run growth? If the rate of technological progress is exogenous to the economic system then growth will be limited by the pace at which technological knowledge is increased. However, technological progress is not exogenous to the economic system. The pace at which firms introduce innovations is largely determined by the rate of capital accumulation; since a large part of technological innovations are embodied in new machines and equipment. This idea, central to the structuralist development theory, mainly in the works of Ragnar Nurkse, was presented in Kaldor (1957) by means of the "technical progress function", which establishes the existence of a structural relationship between the growth rate of output per-worker and the growth rate of capital per-worker. Second, even that small part of technical progress that is disembodied is determined by *dynamic economies of scale* such as *learning-by-doing*. So we can establish the existence of a structural relationship between the growth rate of labor productivity and the growth rate of output known as "Kaldor-Verdoon law"[89]. In this setting, an increase in aggregate demand will cause an increase in the growth rate of labor productivity since the growth rate of output will be increased as a consequence of a greater demand growth.

Based on his reasoning we can say that there is no such a thing as potential or full-employment output for the long-run, since the supply of factors of production and the rate of technological progress is demand determined. "Full-employment" is essentially a short-run concept that ignores that endogeneity of "natural growth rate" in the long-run.

If supply of factors of production should not be considered a limit to long-run growth, what are the determinants of economic growth in the long-run? The ultimate determinant of economic growth is aggregate demand. Firms will increase their production levels as a response to an increase in aggregate demand two conditions are satisfied: i) profit margins are high enough to give to entrepreneurs the rate of profit desired by then; ii) realized profit rate must be bigger than the cost of capital. If these two conditions are met, then the rate of growth of real output will be determined by the rate of growth of *autonomous demand*; i.e. the growth of that part off aggregate demand that is independent of the level and/or variations of the level of output and income.

For open economies there are two components of autonomous demand: exports and government consumption expenditures (Park, 2000). Investment expenditures are not a component of autonomous demand since investment decision in capital assets is basically determined by entrepreneurs' expectations about future growth of production and sales, according to the so-called *principle of acceleration* of investment theory (Harrod, 1939). In other words, investment is not an exogenous variable from the view point of growth process; since it is driven by output growth.

Consumption, in turn, depends, to a large extent on wages, which, given the distribution of income between wages and profits, is a function of the level of production and employment. In this way, given the functional distribution of income, consumption is not an autonomous component of aggregate demand and cannot lead or pull the long-term economic growth. This means that a growth pattern pulled the consumption growth is only possible in a context in which functional distribution of income is been modified over time in favor of the working class. In other words there must be a persistent increase in wage share on income[10].

So, long-run growth rate of real output is a weighted average of the rate of exports growth and the rate of government consumption expenditures.

For a small open economy that do not have a convertible currency, exports growth is the autonomous variable in growth process[11]. If the rate of growth of government consumption expenditures is bigger than the rate of exports growth than real output and income will increase faster than exports. Supposing an income-elasticity of imports bigger than one (as it is usual in open economies) than the rate of imports growth will be bigger than the rate of exports growth, generating a growing trade deficit (assuming constant terms of trade), which will be unsustainable in the long-run.

The growth rate of exports is equal to the product between income-elasticity of exports (ε) and the growth rate of world income (z)[12]. So we can establish that the long-run growth rate of real output (g^*) according to the theory of demand-led growth is given by:

$$g^* = \varepsilon z \quad (1)$$

"External constraint" and capacity constraint

Up to this point we assume that the output level adjusts itself, in the long term, to the growth of autonomous aggregate demand which is constituted fundamentally by exports in the case of a small open economy with non-convertible currency. However, the economy might not present a long-term growth rate equal to the value given by equation (1) due to the presence of constraints to expanding the level of production at the rate determined by the expansion of exports. These restrictions arise from the need

to maintain the balance of payments balanced in the long term, as well as the existence of factors that prevent the full adjustment of the productive capacity of enterprises to the projected growth of its sales.

The issue of external constraint is ancient in development theory. On the model of the *big push* of Rosenstein-Rodan (1943), who founded the structuralist theory of development, this restriction is an assumption. According to this perspective developing countries would face always lack of hard currency, because the income elasticity of their exports of primary goods would be smaller than income-elasticity of their imports of industrial goods. The two gaps model of Hollis Chenery and Michael Bruno (1962) was perhaps the most significant formalization of this idea.

In a second moment, already within the context of the first crisis of structuralism and after post-keynesian ideas become dominant among the heterodox economists, the problem of external constraint to long-term growth is to be associated with the contribution of Thirwall (1979, 2002).

The concept of balance of payments equilibrium growth rate developed by this author start from the finding that cumulative causation models of Kaldorian inspiration kaldoriana, in which the growth rate of demand for exports is the engine of long term growth, are incomplete for not inclin its formal analytical structure a condition for equilibrium of balance of payments. In this context, dependent on the relationship between income elasticity of exports and income elasticity of imports, a growth path led by exports could be unsustainable from the point of view of the balance of payments. Indeed, one of the classical thesis of latin-american structuralist thought was that export of primary goods or commodities was relatively inelastic with respect to income increases in the rich countries, while income elasticity of imports of manufactured goods by developing countries was greater than one. From that premise, who had also served as the basis for the tow-gap model, Thirwall argued that a path of accelerated growth pulled by exports could generate an increasing trade deficit due to an unsustainable growth in imports. In this context, the feasible long-term growth rate would be the one compatible with the balance of payments equilibrium.

According to Thirwall, the balance of payments equilibrium growth rate (g^{**}) is given by:

$$g^{**} = \frac{\varepsilon}{\pi} z \quad (2)$$

Where: ε is the income elasticity of exports, π is the income elasticity of imports, z is the growth rate of world income.

If we understand the Thirwall´s model simply as the thesis that a country, whether developed or developing, cannot in the long run grow at a rate bigger than the one of exports, then we have no objection against it. However, if we understand it as a demonstration of the "convenience" of foreign savings or external financing, the picture changes completely. This is because in middle-income countries we can no longer assume that income-elasticity of imports is greater than income elasticity of exports since the country's exporter of manufactured goods. Even in this case, however, the thesis of external constraint is doubtful.

But the essential thing is to consider the exchange rate. As we will argue in the sequel, income elasticities of exports and imports are not variables exogenous to the model, determined only by the level of technological knowledge obtained by country, but

depend on the current level of real exchange rate. Income elasticities are thus *endogenous* variables that depend on the exchange rate.

When the level of real exchange rate is chronically overvalued due to the non-neutralization of Dutch disease or due to high inflows of foreign capital, the productive structure of the country will be affected, inducing a perverse specialization process in production of goods intense in natural resources and causing low growth due to de-industrialization. Alternatively, when the country manages to counteract the tendency to cyclical overvaluation of real exchange rate, a balanced exchange rate at a level compatible with the "industrial equilibrium" enable a process of industrialization in which country is able to continuously increase the generation of added value of the production process.

This means that the productive structure of a country and, consequently, the income elasticities of exports and imports, are not constants, but depend on the exchange rate; more accurately the relationship between the current value of the exchange rate and the exchange rate of industrial equilibrium. When exchange rate is overvalued in respect to the industrial equilibrium level, then occurs a process of deindustrialization and re-primarization of exports, i.e. a perverse structural change which acts to reduce the income elasticity of exports and increase the income elasticity of imports. In this context, there will be a gradual reduction of the balance of payments equilibrium growth rate. Conversely, if the current value of the exchange rate is at or slightly above the industrial equilibrium level; then there will be a deepening of the country's industrialization process, which will lead to an increase in income elasticity of exports and a reduction of income elasticity of imports, thereby increasing the balance of payments equilibrium growth rate.

In mathematical terms, this reasoning can be expressed as follows:

$$\frac{\partial\left(\frac{\varepsilon}{\pi}\right)}{\partial t} = \beta(\theta - \theta_{ind}) \quad (3)$$

Where: β *i*s a positive constant; $\theta$is the industrial equilibrium exchange rate.

Based on equation (3) we find that Thirwall´s model of balance-of-payments constrained growth provides, at best, only a temporary constraint to long-term growth. Indeed, solving equation (3) for $\frac{\varepsilon}{\pi}$ and substituting the resulting expression in equation (2) we get[13]:

$$\dot{g} = \beta(\theta - \theta_{ind}) \quad (4)$$

In the expression (4) we can see that the balance of payments equilibrium growth rate will adjust over time depending on the relationship between the current value of the exchange rate and the exchange rate of industrial equilibrium. If the exchange rate is over-valued, i.e. when the exchange rate is below the industrial equilibrium, then the rate of growth consistent with the balance of payments equilibrium will be reduced over time, thus indicating a deepening of external constraint. Similarly, if the exchange rate is under-valued, i.e. if the exchange rate is above the industrial equilibrium level, then the equilibrium growth rate of the balance of payments will increase gradually over time. It follows that any growth rate of real output is consistent with balance of payments equilibrium when the exchange rate is at the level of industrial equilibrium. Thus, in the long term, we cannot talk about external constraint to growth if the exchange rate is properly aligned, i.e. a level compatible with the industrial equilibrium.

Capacity constraint and income distribution

Another constraint to long-term growth is given by the productive capacity, since its expansion depends on the investment plans of entrepreneurs and output-capital ratio.

To determine the rate of output growth compatible with the investment plans of entrepreneurs, we consider that the amount of goods and services produced in a given point of time is given by:

$$Q = vuK \quad (5)$$

Where: Q is the level of output, K is the stock of capital, *v* is the output-capital ratio, i.e. the maximum amount of output that can be obtained from a unit of capital; *u* is the degree of capacity utilization.

From (5) we can see that change of the actual output can be decomposed into change variance that is due to changes in the degree of capacity utilization and changes due to changes in the economy's capital stock, assuming a constant capital-output ratio. So we get:

$$\Delta Q = v[K\Delta u + u\Delta K] \ (6)$$

Dividing both sides of (10) by Q, assuming that the rate of depreciation of capital stock is equal to (δ) so that net investment equals to $I = (\Delta K - \delta K)$, we get the following expression:

$$\frac{\Delta Q}{Q} = v\left[\Delta u\frac{K}{Q} + u\frac{I}{Q} + \delta\frac{K}{Q}\right] \ (7)$$

In the long-run equilibrium the degree of capacity utilization is equal to the *normal* level of capacity utilization, i.e. the level of capacity utilization that is desired by firms due to their competition strategy (Oreiro, 2004, p. 47). In this way, we can assume $\Delta u = 0$ in the equation (7), thereby we get the following expression:

$$g^{***} = \frac{\Delta Q}{Q} = u^n\left[v\frac{I}{Q} + \delta\right] \quad (8)$$

Where:u^n is the normal level of capacity utilization.

The equation (8) defines the so-called *warranted growth rate*, i.e. the rate of output growth which, if achieved, will maintain the capacity utilization at its normal level in the long-term (Park, 2000). This concept originates from the seminal work of Harrod (1939).

The net investment as a proportion of GDP, in turn, depends on, as we have argued previously, expected profit rate and the opportunity cost of capital. The rate of profit, in turn, critically depends on the actual value of exchange rate.

The profit rate (R) can be expressed by the following equation:

$$R = \frac{P}{K} = \frac{P}{Q}\frac{Q}{\bar{Q}}\frac{\bar{Q}}{K} = muv \quad (9)$$

Where: P is the aggregate profit, $\bar{Q}$ is the economy's potential output (i.e., the maximum amount of goods and services that can be produced from existing productive capacity), *m* is profit share.

Let us consider now that domestic goods are not homogeneous, so that firms can differentiate their products with respect to goods produced abroad. In this case, the domestic firms have market power, so that they are able to fix the prices of their products on the basis of a *mark-up* over the unitary direct cost of production, such as in equation (10) below:

$$p = (1 + z)[wa_1 + ep^* a_0] \quad (10)$$

Where: p is the price of domestic goods, z is *mark-up* rate or profit margin, w is the nominal wage rate, e is the nominal exchange rate, p * is the price of imported raw materials evaluated in the currency of the origin country of imports, the a_0 is the unitary technical requirement of imported raw material and a_1 is the unitary requirement of labor.

We will assume that domestic goods produced by domestic firms are imperfect substitutes goods produced abroad, in such a way that international trade does not enforce the validity of the *law of one price* for *tradables;* i.e. the purchasing power parity is not valid. However, domestic firms' profit margin is affected by the price of imported goods. More specifically, the ability of domestic firms to establish a price above the unitary direct cost of production on the real exchange rate, which is defined as the ratio of the price of imported goods in domestic currency and the price of domestic goods also in domestic currency. In this context, a devaluation of real exchange rate enables domestic firms to increase *mark-up* due to the reduced competitiveness of the final goods imported from abroad.

So, we can express the *mark-up* as a function of the actual value of real exchange rate as follows:

$$z = z_0 + z_1\theta \quad (11)$$

Where: $\theta = \frac{ep^*}{p}$ is the actual value of real exchange rate

The distribution of income between wages and profits depends on the actual value of real exchange rate. Indeed, profit share is given by:

$$m = \frac{z}{1+z} = \frac{z_0+z_1\theta}{1+z_0+z_1\theta} \quad (12)$$

From equation (12), it can be easily shown that a devaluation of real exchange rate devaluation will promotes an increase profit share.

Based on this reasoning, we can see that the profit rate depends on, among other variables, profit share which, in turn, depends on the actual value of real exchange rate. It follows that a devaluation of real exchange rate, everything else held constant, increase the rate of profit.

So, we can express investment rate as follows:

$$\frac{I}{Q} = \vartheta(\theta, R(\theta) - r) \quad (13)$$

Where: R is the rate of profit expected by entrepreneurs and r is the opportunity cost of capital.

The equation (19) shows that the rate of investment in the economy here considered is a positive function of real exchange rate due to the fact that a devaluation of the exchange rate will produce an increase in profit share and in the rate of profit, inducing entrepreneurs to invest more.

Putting (13) in (8), we get the following expression:

$$g^{***} = u^n\left[v\left(\vartheta(\theta, R(\theta) - r)\right) + \delta\right] (14)$$

Equation (14) presents the warranted rate of growth for a developing economy, taking into account the effect of the real exchange rate on income distribution and on the rate of profit.

A Keynesian-structuralist growth model

Now we are in a position to present a formal model of economic growth that synthesize the theoretical discussion made up to this point. As discussed in section 2, the long-term growth of developing economies which have no convertible currency depends on the rate of growth of exports [equation (1)], which is equal to the product between the income elasticity of exports and the rate of growth of income from the rest of the world. This growth, however, is subject to two types of constraints. The first is the external constraints examined by Thirwall´s growth model. If we take into consideration the effect of real exchange rate over productive structure of the economy, we will conclude that income elasticities of exports and imports of Thirwall´s model are endogenous, so that if the exchange rate is properly aligned, i.e. at the level corresponding to the industrial equilibrium; then any growth rate will be sustainable from the point of view of the balance of payments equilibrium. In other words, external constraint will never be an obstacle to long-term growth.

The second constraint is given by the *warranted rate of growth*, derived from Harrod´s growth model, which determines the real output growth rate that is compatible with the achievement of a normal level of capacity utilization. Since income distribution and the profit rate depend on the real exchange rate, it follows that a devaluation of the real exchange rate will encourage entrepreneurs to invest more, causing, given output-capital ratio, an acceleration of the growth rate of productive capacity. In this way, the production capacity constraint can also be "relaxed" through appropriate variations of the real exchange rate.

The Keynesian-Structuralist growth model is given by the following system of equations:

$$g^{***} = u^n\left[v\left(\vartheta(\theta, R(\theta) - r)\right) + \delta\right] \quad (14)$$

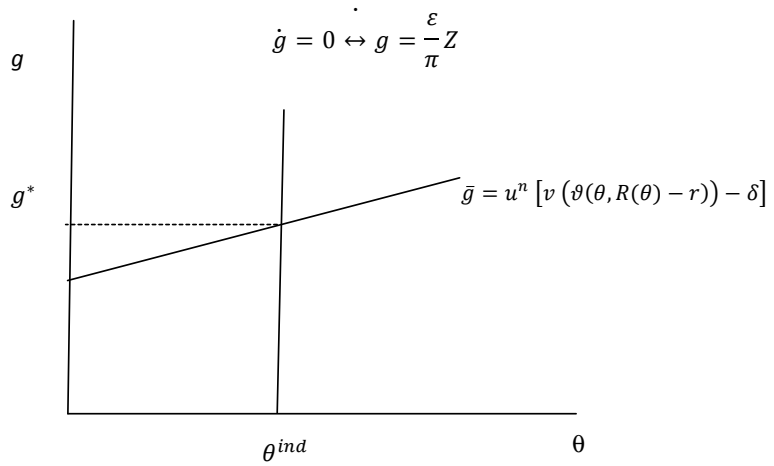
$$\theta = \theta_{ind} \quad (15)$$

The system formed by the equations (14) and (15) have two equations and two unknowns, namely: the real output growth rate (g) and the actual value of real exchange rate (θ). It is, therefore, a determinate system.

The exogenous variables of the model are the industrial equilibrium exchange rate (θ_{ind}), the normal degree of capacity utilization (u^n), the output-capital ratio (v), the real cost of capital (r) and the rate of depreciation of capital stock (δ).

The long rum equilibrium of the economy is defined as the pair of values of real output growth rate and the actual real exchange rate for which productive capacity is growing at the same pace of aggregate demand, in such a way that the degree of capacity utilization remains constant through time and equal to the normal level, and also that productive structure of the economy is constant over time. The determination of long rum equilibrium can be made through the figure 1 below.

Figure 1



We observe in Figure 1 the importance of the real exchange rate for long-term growth. Indeed, real exchange rate plays the role of adjusting mechanism that allowed the simultaneous occurrence of a normal degree of capacity utilization and the stability of productive structure in the long-term. In this way, the growth model presented here puts *real exchange rate in the center of the theory of economic development*.

Dutch disease and excessive capital inflows

For Structuralist Development Macroeconomics, the restriction to long-term growth does not originate from the external constraint or capacity constraint; but from the over-valuation of real exchange rate which has its origin in Dutch disease and excessive capital inflows.

Let us first consider the Dutch disease. Dutch disease is a permanent over-valuation of real exchange rate caused by exports of commodities that uses cheap and abundant natural resources, generating large export revenues for the country. Due to the fact that natural resources cannot be reproducible by labor, being scarce in the classical-Marxist meaning of the term, countries and firms that produces commodities that are intensive in natural resources earn Ricardian rents that enable then to export these commodities even at a more appreciated exchange rate than the one required by industrial firms that operate with state-of-art technology to compete in international markets. As result we have two equilibrium exchange rates for economies that have abundant natural resources: the current account equilibrium real exchange rate and the industrial equilibrium real exchange rate.

Current account equilibrium exchange rate is defined as the actual value of real exchange rate that generates an inter-temporal equilibrium of current account. In this context, Ricardian rents originated by scarcity of natural resources allow the inter-temporal equilibrium of current account equilibrium with a level of real exchange rate that is small than the one required for industrial equilibrium. In other words, there is a decoupling between industrial equilibrium exchange rate and current account exchange rate, the latter becoming more appreciated than the former. This phenomenon is called Dutch disease[14].

Due to the presence of Dutch disease, real exchange rate will appreciate to the level θ^{cc} (Figure 2), originating a negative structural change in the economy. More precisely, a de-industrialization process will begin, which will induce a reduction of income elasticities of exports and an increase in income elasticities of imports. This means that balance of payments equilibrium growth rate will be reduced. At the same time, the appreciation of real exchange rate will produce a reduction of profit margins and in the rate of profit, inducing a contraction in private investment. This means that the warranted rate of growth will also be reduced. In the light of the reduction in the pace of expansion of productive capacity and the process of de-industrialization, the long-run equilibrium output growth rate will be reduced from g^{ind} to g^{cc}.

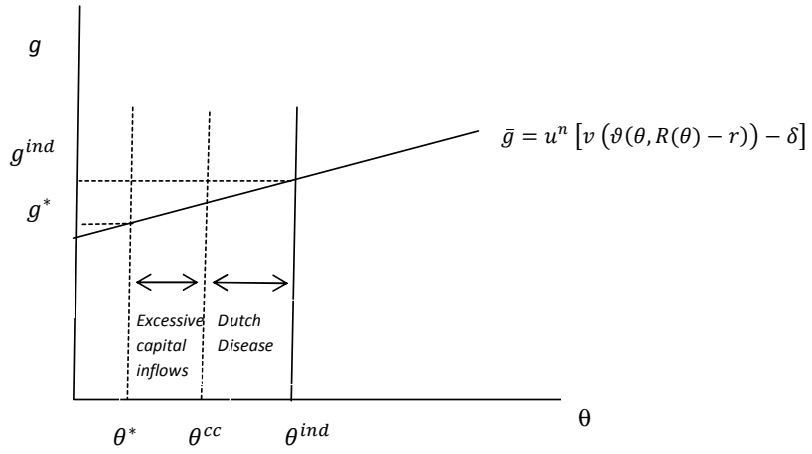
The second cause of chronic over-valuation of real exchange rate in developing countries is "excessive" capital inflows. These inflows are “excessive” because they are not required for balance of payments equilibrium. As we saw, if real exchange rate is at a proper level – that is the level of industrial equilibrium – any rate of output growth is sustainable from the view of balance of payments. Even if a country suffers from Dutch disease, these inflows are neither necessary if real exchange rate is at the current account equilibrium level.

As we discussed above, these excessive capital inflows are, in general, the result of interest rate differentials and the adoption of a growth model with foreign savings. Regarding to interest rate differentials we have to notice that real interest rates are higher in middle income countries than in developed countries for a variety of reasons. First of all, capital markets are less organized in middle income countries than in developed countries, making liquidity premium over long-term bonds higher in the first rather than the former. Second, middle income countries had external debts denominated in foreign currency which is in sharp contrast to developed countries that had external debt denominated in their own currency. This “original sin” problem of middle income countries increase the default risk over external debt, increasing domestic interest rates if prevail a situation of near perfect capital mobility in Mundell´s sense. Finally the adoption of a growth model with foreign savings, according to which foreign savings would be complement, rather than substitute of domestic savings so that current account deficits are beneficial to economic growth, implies government decision to run current account deficits by means of a intentional over valuation of real exchange rate. In order to reach an equilibrium in the balance of payments, domestic interest rates should be kept at higher levels compared to the ones that prevails in developed countries.

As a result of excessive capital inflows, real exchange rate appreciates to a level θ^*, lower than the current account equilibrium level. This means that a middle income country that suffers from *Dutch disease* and excessive capital inflows at once will have a *current account deficit plus de-industrialization*. This situation is shown in figure 2.

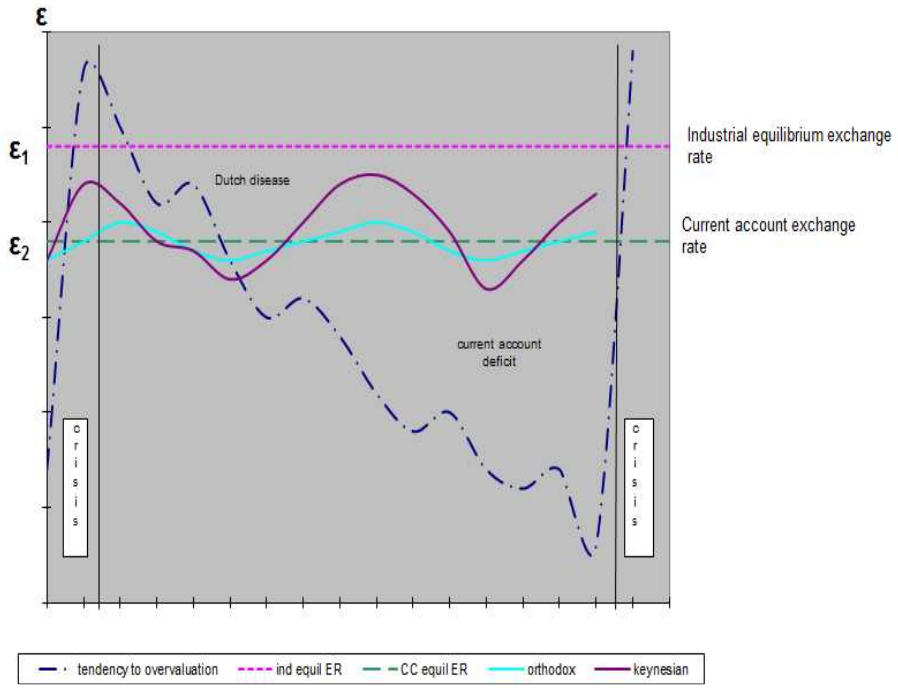
Figure 2

Dutch Disease and Excessive Capital Inflows



Another way of explaining the same ideas and the cyclical tendency of the exchange rate to become overvalued is through Figure 3. In the figure, we have, in the vertical line, the exchange rate, and in the horizontal time. The two horizontal doted lines refer to industrial and the current equilibrium. If the exchange rate is left fully free, the exchange rate will not be just volatile. It will go from sudden stop to sudden stop. The Dutch disease pulls down the exchange rate to the current equilibrium, and excessive capital inflows make the exchange rate to fall below it, into the realm of increasing current account deficits. The cycle ends a when creditors loose confidence, the country falls into defaults, and its currency sharply depreciates. In consequence of this , the exchange rate tends to be chronically overvalued.

Figure 3: **Cyclical tendency to exchange rate overvaluation**



Theoretically a floating exchange rate would prevent this appreciation and avoid the crisis, but this would be true on the condition that markets endogenously balance financial markets. We know that this is not true. A more realistic theory tell us that lending to developing countries is often a speculative practice involving the formation of financial bubbles. Foreign lenders see their prophecy that the exchange rate will continue to appreciate confirmed and keep lending, gaining out of high interest rates and of the appreciation of the local currency. They will continue to lend, until that, all of a sudden, they, in a well known herd movement, lose confidence, suspend the renovation of their loans of the existing debt, and the currency crisis breaks out.

Conclusion

Throughout this article we present a theoretical framework for structuralist development macroeconomics. Based on this framework we can see that the development of middle-income countries, which has not a convertible currency, is pulled by the rate of export growth. The real exchange rate plays a central role in economic development because it is the price that matches the normal degree of capacity utilization with the stability of long-term productive structure. If the actual value of real exchange rate is at its right

level, i.e. at the level that allows domestic firms that operate state-of-the-art technology to be competitive on international markets; then, there will be no external constraint to development, which will be limited only by the rate of investment and the productivity of capital. The abundance of natural resources can, however, act as a barrier to economic development to the extent that Ricardian rents resulting from the exploration of these resources will result in a permanent over-valuation of exchange rate. Additionally, excessive capital inflows add a new impetus for exchange rate over-valuation, resulting in current account deficits. Both factors appreciating chronically the exchange rate will not only discourage productive investment, but also induce a process of structural change, with de-industrialization and perverse re-primarization of exports. The combined effects of Dutch disease and excessive capital inflows will result in a path of real output that is lower than the one verified in developed countries. In this case the middle-income country will enter in a falling-behind path.

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[1] We refer to economists like Rosenstein-Rodan, Ragnar Nurkse, Gunnar Myrdal, Michal Kalecki, Raul Prebisch, Hans Singer, Celso Furtado, Albert Hirschman and Nicholas Kaldor.

[2] In the realm of this project, the “Ten Theses on New Developmentalism” were defined in 2010 and originally subscribed by 80 economists. They are available in the respective website, www.tenthesesesonnewdevelopmentalism.org and in December 2011 special issue of the *Brazilian Journal of Political Economy* (vol. n.5).

[4] This is the case of Brazil which, between 1930 and 1990, had neutralized Dutch disease through the "currency confiscation" and went through industrialization, but, after the Debt crisis of 1980´s, liberalized exchange rate market and no longer practiced this neutralization, and, as a result of this policy and excessive capital inflows a premature process of de-industrialization had occurred.

[6] It should be noted that the determination of savings by investment also occurs in an economy that operates on conditions of "full employment". Indeed, as argued by Kaldor (1956), an economy that operates along a path of balanced growth with full employment of the workforce, an increase in the rate of investment will result in an increase in profit margins, leading to a redistribution of income of workers

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to capitalists. Since propensity to save of the capitalists is higher propensity to save of workers, than increased in profit share will result in an increased aggregate rate of savings

[7] In the case of Brazil, industrial production could increase near by 44% - according to IEDI estimates (Valor Econômico, 24/03/2006) – compared to the current level of production by means of increasing the number of work hours. If we consider the adoption of additional work turns, production could increase almost 57% compared to the current level of production.

[8] Some econometric evidence about the validity of "Kaldor-Verdoon's Law" for United States can be found in McCombie and De rider (1984).

[9] Ledesma (2002) estimates a demand-led growth model for 17 OECD countries (Germany, Australia, Austria, Belgium, Canada, Denamark, United States, Spain, Finland, France, Italy, Holland, Japan, Norway, Portugal, Sweden and United Kingdom) in the period 1965-1994. Based on his econometric evidences, we can establish the existence of a structural relationship between the growth rate of labor productivity and a set of other variables, in particular the growth rate of output. The estimated structural equation is:

$$r = -0.015 + 0.642y + 0.0002(I/O) + 0.617K + 0.021GAP,$$

Where: r is the growth rate of labor productivity, y is the growth rate of real output, (I/O) is investment as a share of real GDP, K is a index of technological innovation and GAP is an estimate of the technological gap.

[10] Changes in income distribution between wages and profits can occur only within certain limits, if existence conditions of capitalist economies must be met. As emphasized by Kaldor (1956, 1957), profit share has a lower limit determined by the requirement of obtaining a minimum rate of profit, below which capitalists will not be willing to invest. Therefore, it is impossible to sustain indefinitely a consumption-led growth trajectory. At some point of time, the growing share of wages in income will cause profit share to reach its minimum value. When this happens, consumption can no longer grow autonomously with respect to output and income level, thereby losing the ability to lead long-term growth.

[11] You must make an important distinction between government consumption spending and government investment spending. Although both types of government expenditure are autonomous with respect to the level and/or the variation of current income, government investment spending delivers a positive externality on private investment, reason for which a growth policy based on fiscal expansion should focus on increasing investment spending, rather than increasing consumption spending. On the effect of public investment on the growth of long-term see Oreiro, Silva and Fortunato (2008).

[12] Assuming that the terms of trade remain constant over time

[13] Without loss of generality we assume z = 1

[14] In this regard see Bresser-Pereira (2008, 2009).