Structuralist Development
Macroeconomics and New Developmentalism

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Overview

• Structuralist development economics was formulated between 1940 and 1960 by a group of economists associated to the transition of the League of Nations to the United Nations.

• 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.
Overview

• 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.
Macroeconomics for the long run

• 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.
  – 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".
Structuralist Development Macroecnomics

• 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*.
• 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.
Economic Growth in Keynesian-Structuralist Tradition

• Solow (1957): Neoclassical growth models take for granted that the ultimate limit to long-run growth is the supply of factors of production.
  – Aggregate demand is relevant only to determine the degree of productive capacity in the short-run, but has no lasting impact over the growth rate of productive capacity. In the long-run, Say’s Law is valid, that is, supply determines demand.

• Kaldor (1988): Demand-Led Growth Theory
  – The natural rate of growth is determined by the growth of autonomous aggregate demand (exports or government consumption) because technical progress and the growth of labor force is endogenous and investment depends on the rate of output expansion.
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.
- 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.
Development pulled by demand

• In a small open economy that does not have a convertible currency 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.
Export-led Growth

• The growth rate of exports is equal to the product between income-elasticity of exports ($\varepsilon$) and the growth rate of world income ($z$).

• 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:

$$g^* = \varepsilon z$$
Demand-Led Growth Models

• One possible way to formalize the demand-leg growth theory – although this is not the only one – is by means of cumulative causation models.

• These models have, in general, four equations:
  – a first equation where the growth rate of real output is a function of the growth rate of exports.
  – a second equation in which the growth rate of exports is a function of the rate of change of terms of trade and of the growth rate of World’s income.
  – a third equation that specifies the productivity growth rate as a function of the growth rate of real output (a simple formalization of Kaldor-Verdoorn law).
  – a fourth equation where the rate of change of domestic prices is determined by the rate of change in nominal wages, the growth rate of productivity and the rate of change of nominal exchange-rate.
Thirwall-Dixon Model (1975)

\[ \hat{q}_t = r + \alpha \hat{Y}_{t-1} \quad (1) \]

\[ \hat{p}_t = \hat{w}_t - \hat{q}_t \quad (2) \]

\[ \hat{X}_t = \beta_j (\hat{p}_{w,t} + \hat{e}_t - \hat{p}_t) + \gamma \hat{Y}_{w,t} \quad (3) \]

\[ \hat{Y}_t = \lambda \hat{X}_t \quad (4) \]
Substituting (1) in (2), we get:

\[ \hat{p}_t = \hat{w}_t - r - \alpha \hat{Y}_{t-1} \]  
(1a)

Taking a fixed exchange rate regime and substituting (1a) in (3) we get:

\[ \hat{X}_t = \beta_j \left( \hat{p}_{w,t} - \hat{w}_t + r + \alpha \hat{Y}_{t-1} \right) + \gamma \hat{Y}_{w,t} \]  
(3a)

For the rest of the world we have:

\[ \hat{p}_w = \hat{w}_w - r - \alpha \hat{Y}_w \]  
(1b)

Substituting (1b) in (3a) we get:

\[ \hat{X}_t = \beta_j \left( \hat{w}_{w,t} - \hat{w}_t \right) + \alpha \left( \hat{Y}_{t-1} - \hat{Y}_w \right) + \gamma \hat{Y}_{w,t} \]  
(3b)

Considering relative wages constant around the world, and substituting (3b) in (4) we get:

\[ \hat{Y}_t = \lambda_t \beta_j \alpha \hat{Y}_{t-1} + (\gamma - \alpha \beta_j) \lambda_t \hat{Y}_{w,t} \]  
(4)

Solving for the steady-state growth we get:

\[ g = \frac{(\gamma - \alpha \beta_j) \lambda}{1 - \lambda \beta_j \alpha} g_w \]  
(5)
Steady-State Growth and Caching-up

Stability condition: \( 1 > \lambda \beta_j \alpha \)

Caching-up condition: \( \frac{(\gamma - \alpha \beta_j) \lambda}{1 - \lambda \beta_j \alpha} > 1 \iff \gamma > \frac{1}{\lambda} \)

Remark: Output growth may be demand led, but the capacity of demand to create its own supply depends on the productive structure (Keynes-Kaldor-Thirwall Modified Principle of Effective Demand)
Balance of Payments Equilibrium Growth Models

• The concept of balance of payments equilibrium growth rate developed by Thirwall start from the finding that cumulative causation models of Kaldorian inspiration, in which the growth rate of demand for exports is the engine of long term growth, are incomplete for not include 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 two-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
Thirwall´s Law

• According to Thirwall, the balance of payments equilibrium growth rate is given by:
  
  \[ g^{**} = \frac{\varepsilon}{\pi} \]

  • Where: \( g^{**} \) is the income elasticity of exports, \( \varepsilon \) is the income elasticity of imports, \( z \) is the growth rate of world income.
The Inconsistency and Over-Determinantion Problem in BPCG Models

• Conventional versions of BOP growth model take for granted that capitalist economies are constrained by effective demand, not by supply factors, in the long run. This assumption is supposed to be a sufficient condition for ignoring any element of the supply side of the economy in the structure of these models. In particular, it is supposed that capital stock always adjust itself to the growth rate of real output that is given by BOP restrictions.

• As it is shown by Palley (2002, p.120), the failure to incorporate the supply side of the economy in the structure of BOP models give rise to an internal inconsistency due to the fact that, in the long run, not only is growth constrained by the requirement of current account balance, but also the rate of growth of real output must be equal to the rate of growth of productive capacity in order to allow a constant rate of capacity utilization.
The inconsistency ...

• According to Palley this inconsistency could be solved by making the income elasticity of demand for imports to be a negative function of excess capacity. By doing so, growth rate of real output will be determined by the requirement that demand growth has to be equal to growth rate of productive capacity. The BOP restraint will then determine the level of excess capacity, given the growth rate of real output.

• The solution given by Palley, however, do not make a distinction between the growth rate of productive capacity – given by the growth rate of capital stock – and the growth rate of potential output – given by the sum of productivity growth and the growth rate of the labor force.
The inconsistency ...

• One possible explanation for this “logical slip” is that Palley is describing a simplified economy which employs unassisted labor.

• In this case, potential output grows according to the growth rate of labor productivity and labor force.
  – Under these assumptions it is correct to assume that natural and warrant rate of growth are necessarily equal.
  – However, if capital goods are also required for production, then this equality will not hold, and BOP growth model is over-determined in the sense that one variable (capacity utilization) is determined by two different and independent equations, assuming values that are, in general, inconsistent one with the other.
A Full Specified BPCG Model

Let us consider an open economy described by the following equations:

\[ \hat{X} = a_0 g^* \quad (1) \]
\[ \hat{M} = (b_0 + b_1 u)g \quad (2) \]
\[ \hat{X} = \hat{M} \quad (3) \]
\[ \hat{u} = g - g_k \quad (4) \]
\[ g_k = g_0 + g_1 u \quad (5) \]
\[ g_n = \tau + n \quad (6) \]
\[ \tau = c_0 + c_1 g \quad (7) \]
Model’s Solution

Getting (7) in to (6) we have:

\[ g_n = c_0 + n + c_1 g \quad (8) \]

Balanced-growth requires the equality between warrant and natural growth rates, that is:

\[ g_k = g_n \quad (9) \]

Besides that, it is also necessary that capacity utilization is constant through time:

\[ \hat{u} = 0 \Leftrightarrow g_k = g \quad (10) \]

Substituting (5) and (10) in (4), we get:

\[ g = g_0 + g_1 u \quad (11) \]
After substituting (9) and (10) in (8) we get:

\[ g = \frac{c_0 + n}{1 - c_1} \]  \( (12) \)

Equation (12) gives the growth rate of real output that is compatible with the equality of the warrant and natural growth rate. The mechanism by which warrant and natural growth rates adjust one to the other is the level of capacity utilization. Indeed, substituting (12) in (11) we get:

\[ u = \left( \frac{1}{g_1} \right) \left[ \frac{c_0 + n}{1 - c_1} - g_0 \right] \]  \( (13) \)
The over-determination problem

Equation (13) gives the value of capacity utilization that is compatible with the equality between warrant and natural growth rates, that is, the rate of capacity utilization that allows productive capacity to grow at the same rate of potential output.

This is not, however, the only value for capacity utilization that is determined by the model. Indeed, after substituting (1) and (2) in (3) we get:

\[ a_0 g^* = (b_0 - b_1 u) g \] (14)

Finally, after substituting (12) into (14), we arrive at:

\[ u = \left( \frac{1}{b_1} \right) \left[ a_0 g^* \left( \frac{1-c_1}{c_0+n} \right) - b_0 \right] \] (15)
Solving the Inconsistency: Real Exchange Rate and Income Elasticity of Imports

• Although Palley’s solution is not able to eliminate the inconsistency problem in BOP constrained growth models, it is on the right track.

• In order to eliminate the over-determination of a system of equations, it is necessary to increase the number of endogenous variables, which requires transform some parameters into unknowns of the system.

• The relevant question is which variable should be considered as an endogenous variable in order to eliminate the over-determination problem?

• A remarkable omitted variable in BOP constrained growth models is the level of real exchange rate.

• This omission is justified by the assumption that in dynamic models what matters is not the level of real exchange rate, but the rate of change of this variable. Being so, the rate of change of real exchange rate could, in principle, influence the growth rates of imports and exports through price elasticities in import and export dynamic equations.

• However, a non-zero rate of change for real exchange rate is, by definition, incompatible with balanced growth.

• This means that for the calculation of the balanced growth rate of real output, rate of change of real exchange rate should be set in zero, eliminating all influence of real exchange rate from the system.
Solving ....

• There is a channel by which the level of real exchange rate could influence the growth rate of exports and imports that is not considered in the traditional BOP constrained growth literature.

• This channel consists in making income elasticities of imports and/or exports a function of real exchange rate.

• Income elasticities are dependent upon the productive structure of the economy, more specifically, on the level of specialization of its productive structure.

• A high level of specialization is associated with a high marginal propensity to import and, consequently, with a high income elasticity of imports.

• It is also clear that a high level of specialization will be associated with low elasticity of exports, since the economy will have few different types of goods to export in face of increasing world demand.
Solving ....

• The level of specialization of an economy is affected by real exchange rate, since this variable is of fundamental importance for determining unitary labor costs through out the world and, consequently, the worldwide level of productive specialization.

• In this setting, a higher (more depreciated) real exchange rate will induce a decrease in productive specialization, since it will reduce unitary labor costs in domestic economy, making a large number of goods be profitably produced in home country.

• This change in the level of productive specialization will induce a decrease in the income elasticity of imports and, probably, also an increase in the income elasticity of exports
The new version of BOP constrained growth model is given by:

\[ \hat{X} = a_0 g^* \quad (1) \]

\[ \hat{M} = (b_0 - b_1 \theta) g \quad (2a) \]

\[ \hat{X} = \hat{M} \quad (3) \]

\[ \hat{u} = g - g_k \quad (4) \]

\[ g_k = g_0 + g_1 u + g_2 \theta \quad (5a) \]

\[ g_n = \tau + n \quad (6) \]

\[ \tau = c_0 + c_1 g \quad (7) \]
the balanced growth rate of real output is given by:

\[ g = \frac{c_0+n}{1-c_1} \quad (12) \]

Putting (12) into (5a) we get:

\[ u = \left( \frac{1}{g_1} \right) \left\{ \left[ \frac{c_0+n}{1-c_1} \right] - g_0 \right\} - g_2 \theta \quad (16) \]

Equation (16) gives the level of capacity utilization that is compatible with balanced growth as function of real exchange rate. It is easy to shown that:

\[ \frac{\partial u}{\partial \theta} = -\left( \frac{g_2}{g_1} \right) < 0 \quad (16a) \]

From equations (1), (2a), (3) and (12) we have:

\[ \theta = \left( \frac{1}{b_1} \right) \left\{ b_0 - a_0 g^* \left( \frac{1-c_1}{c_0+n} \right) \right\} \quad (17) \]
Equation (17) gives the value of real exchange rate that adjusts the growth rate compatible with balance of payments constrained growth with the growth rate compatible with balanced growth. This means that the role of real exchange rate in BOP constrained growth models in to make compatible the requirement of current account balance with the requirement that the growth rate of real output to be equal to the growth rate of potential output. Real exchange rate is now at the center of Post Keynesian growth models.

Once real exchange rate is determined in equation (17), the level of capacity utilization could be determined by equation (16). Than we have:

\[ u = \left( \frac{1}{g_1} \right) \left\{ \left[ \left( \frac{c_0 + n}{1 - c_1} \right) - g_0 \right] - \left( \frac{g_2}{b_1} \right) \left[ b_0 - a_0 g^* \left( \frac{1 - c_1}{c_0 + n} \right) \right] \right\} \] (18)
Real Exchange Rate and Capacity Utilization

Figure 1
Productive Structure, Real Exchange Rate and Balance of Payments Constraint

• Proposition: in the long run there is no such a thing as a balance of payments constraint if real exchange rate is on the “right” level.

• Income elasticities of imports and exports, which are taken as given in the Thirwall (1979) balance of payments growth model, are endogenous variables in the long run, being dependent of productive structure and real exchange rate.

• Our starting point will be a reformulation of the Ricardian model of international trade proposed by Dornbusch, Fischer and Samuelson (1977).
Ricardian model of international trade

• Let us consider a world economy composed of two countries (A and B).
• The only input used in production is labor and there is a *continuum* $Z$ of commodities defined in the closed interval $[0,1]$.
• These commodities can be classified in a decreasing order of comparative advantage by means of the ranking of the labor requirement for production of each commodity in both economies.
Ricardian Model ...

\[
\frac{a_1^*}{a_1} > \frac{a_2^*}{a_2} > ... > \frac{a_n^*}{a_n} > ...
\]
Where: \( a_i^* \) is the labor requirement for production of commodity 1 in country B and \( a_i \)
is the labor requirement for production of commodity 1 um country A.

Let \( A(Z) = \frac{a^*(Z)}{a(Z)} \) the relative productivity of labor employed in the production of
commodity Z. We will assume that: \( A'(Z) < 0 \).

The international specialization of each commodity in country A or B will depend on
the structure of relative wages. Commodity Z will be produced in country A if and only
if the following condition was met:

\[
a(z)w < a^*(z)w^* \iff \frac{a^*(z)}{a(z)} > \frac{w}{w^*} \quad (14)
\]

Where: \( w^* \) is the real wage that prevails in economy B; \( w \) is the real wage that prevails
in economy A.
Modified Version of the Ricardian Model

In the version presented here we will assume that real wage is determined by a bargaining process between firms and labor unions, and that there is an inverse relation between the level of the real wage in a country and the real exchange rate. So, the real wage paid in economy A can be expressed by:

\[ w = f(q) \quad ; \quad f' < 0 \quad (15) \]

Where: \( q \) is the real exchange rate.
In a world economy composed of only two countries, a real exchange rate appreciation in one country means real exchange rate depreciation in the other country.

If the real exchange rate appreciates in country A, real wage must increase in this economy.

The other side of this story will be a exchange rate depreciation in country B and a reduction in real wage in this country.

So a real exchange rate appreciation in country A will displace the structure of relative wages upward, reducing the number of commodities produced in country A and increasing the number of commodities produced in country B.

From this reasoning we can conclude that a real exchange rate appreciation in country A will produce an increase in the level of productive specialization of this economy.
Effects of a Real Exchange Rate Appreciation in the Ricardian Model

Figure 3: Change in the level of international specialization
Effects of an increase in the level of productive specialization

- As shown by Dosi, Pavitt e Soete (1990, ch.7) an increase in the level of productive specialization of an economy will increase the marginal propensity to import of this economy, decreasing the value of exports multiplier (reduction in income elasticity of exports).
- This reduction of exports multiplier will cause a reduction in the long-run equilibrium value of output growth.
- As a final conclusion of this reasoning, we can say that real exchange rate can affect the growth rate of capitalist economies by other channels than its direct impact over the level of exports and imports.
- Real exchange rate has not only a static effect over these variables, but also a dynamic impact, influencing the growth rate of exports and imports.
- The literature about exchange-rate and growth emphasizes the *static effects* of real exchange rate changes over the level of current account balance by means of the estimations of price-elasticity of demand for exports and imports.
- These empirical studies show that price-elasticies are low; so that changes in the level of real exchange rate are supposed to have almost no effect over growth rates in a demand-led growth regime.
- These studies, however, do not take in consideration the impact of changes in the real exchange-rate over income elasticities of demand for exports and imports. But this channel seems to be the way by which exchange-rate policy can affect the long-run growth rates of capitalist economies.
Empirical Evidence

• To assess whether the income elasticity of exports is affected by the real exchange rate and the technological gap, we will investigate 30 developed and developing countries using the methodology of *time series* (first stage) and *cross-country* (second stage).

• We will use a regression process in two stages:
  – (i) we estimate the values of the selected countries’ income elasticities of exports in the period 1995 – 2005; and
  – (ii) we estimate the response of the income elasticity of exports of a country against the fluctuations in the real exchange rate and in the technological gap
FIGURE 2 – INCOME ELASTICITY OF EXPORTS VERSUS REAL EXCHANGE RATE

Source: own elaboration from IFS data.
Exchange rate and the endogenity of income elasticities

- 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.
Industrial equilibrium exchange rate and structural change

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

\[ \frac{\partial (\varepsilon)}{\partial t} = \beta (\theta - \theta_{\text{ind}}) \]  

(3)

• 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 \( \dot{g} \) and substituting the resulting expression in equation (2) we get:

\[ \dot{g} = \beta (\theta - \theta_{\text{ind}}) \]  

(4)
Capacity constraint and income distribution

• 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).

\[ g^{**} = \frac{\Delta Q}{Q} = u^n \left[ v \frac{I}{Q} - \delta \right] \]
Investment function and exchange rate

• 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:

\[
R = \frac{P}{K} = \frac{PQ\bar{Q}}{Q\bar{Q}K} = \mu \nu
\]
Exchange rate and mark-up pricing

• 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:

\[ p = (1 + z)[wa_1 + ep^*a_0] \]
Exchange rate and mark-up pricing

- 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:
- \( z = z_0 + z_1 \theta \)
Exchange rate and profit share

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

\[ m = \frac{z}{1+z} = \frac{z_0 + z_1 \theta}{1 + z_0 + z_1 \theta} \]
Exchange rate and investment function

• 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:

\[ \frac{I}{Q} = \phi(\theta, R(\theta) - r) \]
Exchange rate and the warranted rate of growth

• 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.

\[ g^{**} = u^n\left[v(\theta(\theta, R(\theta) - r)) + \delta\right] \]
A Keynesian-Structuralist growth model

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

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

• (15) \[ \theta = \theta_{ind} \]

• 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 (). It is, therefore, a determinate system.

• The exogenous variables of the model are the industrial equilibrium exchange rate, the normal degree of capacity utilization, the output-capital ratio, the real cost of capital and the rate of depreciation of capital stock.
Long-run equilibrium

Figure 1

\[ \dot{g} = 0 \iff g = \frac{\varepsilon}{\pi} \]

\[ \bar{g} = u^n \left[ v \left( \theta, R(\theta) - r \right) \right] - \delta \]
Properties of the long run equilibrium

- In the long-run equilibrium, output growth is demand led: Thirwall’s law hold, and output growth is equal to the ratio between long-run growth rate of exports and income elasticity of imports.
- Capacity utilization is equal to its long-run normal level, which means that output and capital stock are growing at the same rate.
- Profit share is constant in the long run equilibrium, which means that real wages are increasing at the same rate of labor productivity.
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.

• 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
Dutch disease and excessive capital inflows

• 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.

• 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.
Figure 2

Dutch Disease and Excessive Capital Inflows

\[ \bar{g} = u^n \left[ v \left( \vartheta(\theta, R(\theta) - r) \right) - \delta \right] \]
Final remarks

• We had 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.
Core Principles of New Developmentalism

1. Manufacturing industry is the engine of long run growth of capitalist economies, mainly developing economies.

2. The dynamics of manufacturing industry depends on price and non-price competitiveness, the first one largely determined by real exchange rate and the last by technological gap.

3. Exchange rate overvaluation (resulting from Dutch disease and/or capital inflows) produces premature deindustrialization and generates a substitution of domestic savings for foreign savings. Countries that are affected by this illness will show a low growth path in the medium to long run as well as a chronic scarcity of domestic savings.

4. The elimination of exchange rate overvaluation requires a temporary reduction of real wages. The acceleration of productivity growth due to the structural change induced by real exchange rate devaluation will allow a higher rate of increase of real wages in the medium term, making workers standard of living to be higher than otherwise will be in just few years after the exchange rate devaluation.
Dynamics of Structural Change

• Gabriel, Oreiro and Jayme Jr. (2016):
  \[
  \hat{h}_s = \sigma(\theta - \theta^i) - \beta(G - 1)
  \]

• Where:
  – \( \hat{h}_s \) is the rate of change of manufacturing share on the output of the south;
  – \( \theta \) is the real exchange rate;
  – \( \theta^i \) is the industrial equilibrium exchange rate;
  – \( G \) is the technological gap (\( G=1 \) means that the country is on technological frontier);
  – \( \sigma \) is a coefficient that captures the level of trade barriers in the south economy;
  – \( \beta \) is a coefficient that captures the sensitivity of productive structure to technological gap.
PIB *per capita* e Complexidade Econômica

\[ y = 0.499 \ln(x) - 3.9703 \]
\[ R^2 = 0.6413 \]

**Fonte:** MIT (2017) e WDI (2017).

Relação entre Indústria Manufatureira e Complexidade Econômica

Appendix 1 – Dynamic panel – countries samples by technological gap

<table>
<thead>
<tr>
<th>Emerging or underdeveloped countries</th>
<th>Developed Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) “Intermediate” $G$ (i.e. within a standard deviation between)</td>
<td>(4) Technological frontier (N=18)</td>
</tr>
<tr>
<td>Argentina, Bolivia, Botswana, Brazil, Bulgaria, Cameroon, Chile, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt Arab Rep., El Salvador, Estonia, Gabon, Georgia, Indonesia, Iran. Islamic Rep., Jordan, Korea. Rep., Latvia, Lithuania, Malaysia, Mauritius, Mexico, Moldova, Mongolia, Morocco, Namibia, Nigeria, Oman, Panama, Paraguay, Philippines, Russian Federation, Senegal, South Africa, Thailand, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Ukraine, Uruguay</td>
<td>Australia, Austria, Denmark, Finland, France, Germany, Greece, Italy, Japan, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States.</td>
</tr>
<tr>
<td>(N=45 and T=22)</td>
<td>(N=18 e T=22)</td>
</tr>
</tbody>
</table>

| (2) “High” $G$ (i.e. within one and two standard deviation between) |
| Bangladesh, Ghana, India, Kenya, Mali, Mauritania, Pakistan, Sudan, Uzbekistan, Vietnam, Zambia, Zimbabwe |
| (N=12 and T=22) |

| (3) “Very high” $G$ (i.e. within two standard deviation between) |
| Ethiopia, Guinea, Liberia, Madagascar, Malawi, Mozambique, Tajikistan, Tanzania, e Uganda. |
| (N=9 and T=22). |

| Broad sample (1)+(2)+(3)+(4) |
| (N=84 and T=22) |

Source: Author’s own elaboration.
Index of Exchange Rate Undervaluation

• Rodrik’s methodology (2008)
  
  \[ \ln RER_{it} = \ln (XRAT_{it}/PPP_{it}) \]
  
  \[ \ln RER_{it} = \alpha + \beta \ln (PIBpc_{it}) + f_t + u_{it} \]
  
  \[ \ln (misxrate_{it}) = \ln RER_{it} - \ln \overline{RER}_{it} \]
<table>
<thead>
<tr>
<th>Tabela 11 – Estimações para Painel Dinâmico (GMM) – Arellano e Bond (Diff GMM – two step Robust) com erros padrões de Windmeijer (2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{tcepibpc} )</td>
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<tr>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>( l.\text{tcepibpc} )</td>
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<tr>
<td>( l.\text{mixrrate} )</td>
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<tr>
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<tr>
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<td>( \text{tcpop} )</td>
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<tr>
<td>( _\text{cons} )</td>
</tr>
<tr>
<td>Teste de Arellano e Bond para AR(1) – ( \Delta )</td>
</tr>
<tr>
<td>( \text{Teste de Arellano e Bond para AR(2) – ( \Delta )} )</td>
</tr>
<tr>
<td>Teste de Sargan para a sobreidentificação das restrições - ( B )</td>
</tr>
</tbody>
</table>

Nota: As estatísticas \( t(z) \) estão entre parênteses; \( *p<0.05, **p<0.01, ***p<0.001 \). Em \( A \) – A hipótese nula é que não existe correlação de ordem “\( n \)” nos resíduos. Em \( B \) – A hipótese nula é que o modelo está corretamente especificado e que todas as sobreidentificações estão corretas.

Fonte: Elaboração própria.
Substitution of domestic savings for foreign savings is due to real exchange rate appreciation.

When a real appreciation occurs, real wages are increased as well as wage share.

Since propensity to consume out of wages is bigger than propensity to consume out of profits, then domestic consumption increases, causing a reduction of domestic saving rate.

Real exchange rate appreciation, on the other hand, generate a reduction of exports and an increase of imports generating an increase in current account deficit, i.e. an increase in foreign savings.
Domestic savings as a ratio to GDP and (Bilateral) Real Exchange Rate in Brazil (2000-2016)

Câmbio Real  
Poupança privada
Causality Granger Test

• Technical note
  – Causality runs from real exchange rate to domestic saving rate, not other way around.
Causality Granger Test

Pairwise Granger Causality Tests
Date: 06/14/17   Time: 09:36
Sample: 2000Q1 2016Q4
Lags: 2

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLNSPRIVREAL does not Granger Cause DLNCAMREAL</td>
<td>65</td>
<td>0.65338</td>
<td>0.5239</td>
</tr>
<tr>
<td>DLNCAMREAL does not Granger Cause DLNSPRIVREAL</td>
<td>6.37114</td>
<td>0.0031</td>
<td></td>
</tr>
</tbody>
</table>

O resultado “DLNSPRIVREAL does not Granger Cause DLNCAMREAL” está dizendo que você NÃO consegue rejeitar a hipótese de DLNSPRIVREAL não causa DLNCAMREAL (Prob = 0.5239, que é maior do que 5%), portanto, isso é verdade.

O resultado “DLNCAMREAL does not Granger Cause DLNSPRIVREAL” está dizendo que você deve rejeitar a hipótese de DLNCAMREAL não causa DLNSPRIVREAL (Prob = 0.0031, que é menor do que 5%), portanto, DLNCAMREAL causa no sentido de granger DLNSPRIVREAL.
Level and Growth rate effect over real wages of an exchange rate depreciation

\[
\ln \omega_{j,t}
\]
Obstacles to a Real Exchange Rate Depreciation

• Real wage resistance: If real wages are rigid due to, for instance, indexation, then the only effect of nominal exchange rate devaluation will be a proportional increase in the domestic price level.
  – Real wage resistance will be higher when the time period between nominal wage negociations is shorter.
  – In 1982 the max-devaluation of 30% of nominal exchange rate made by Finance Minister Delfim Netto did not produce a real exchange rate devaluation because it was followed by a reduction of the time interval between wage negociations from 12 to 6 months.
  – Inflation accelaration had eroded the effect over real exchange rate of a nominal exchange rate devaluation.

• In such a case, nominal exchange rate devaluation will produce only inflation acceleration..
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