Capital Accumulation, External Indebtedness and Macroeconomic Performance of Emerging Countries*

Felissa Sousa[*]
Marcos Rocha[**]
José Luis Oreiro[***]

***Abstract**: This paper aims at presenting a non-linear dynamic model to evaluate at theoretical and empirical level the relationship between external indebtedness and economic growth in emerging countries. For this intent, it is presented a post-keynesian endogenous growth model in which: i) desired rate of capital accumulation is supposed to be a non-linear function of external indebtedness as share of capital stock; ii) there is an endogenous country risk premium, which is supposed to be an increasing (linear) function of the external indebtedness (as a share of capital stock); iii) there is a fixed exchange rate regime and perfect capital mobility in the sense of Mundell and Fleming. The main theoretical result of the model is the existence of two long-run equilibrium positions, one of them with a high level of external indebtedness (as a ratio of capital stock) and a low profit rate and the other with a low level of external indebtedness and a high profit rate. This means that an "excessive" external indebtedness can result in a stagnant growth due to its negative effect over the rate of profit. To test the effects of external indebtedness over the rate of economic growth in emerging economies, it is estimated a dynamic panel which evaluates if external savings has an effective negative impact over the income per capita path of emerging countries. The empirical test of demand-led growth equations with a dynamic panel for 73 emerging countries confirms the potential negative effects of external savings over the long-run rate of growth of the countries in the sample.*

***Key-Words:** Foreign savings, balance of payments, and capital accumulation*

JEL Code: F3, F4, O2

MAY, 2009

[*] Financial support of the National Scientific Council is acknowleged.
[*] Departamento de Economia – UnB. E-mail: felissa.sousa@gmail.com
[**] PhD candidate at EESP/FGV. E-mail: marcosrocha@gvmail.br
[***] Associate professor of economics at Universidade de Brasília and Researcher of the National Scientific Council. E-mail: jlcoreiro@terra.com.br. Web Page: www.joseluisoreiro.ecn.br.

1. Introduction

The proponents of capital account liberalization argues that one of the main benefits of free convertibility is that it brings to emerging countries a larger access to international capital markets and a larger flow of external savings to these countries. An increase in the saving rate (internal + external) will produce an increase in the gross domestic product *per capita* of these economies in the long run, according to neoclassic models such as Solow-Swan. It is then obvious that the emerging countries should open its capital accounts as a means to increase the level of income *per capita*, catching up with the developed countries' level of income.

This view "pro free convertibility of the current account" is mainly founded in the hypothesis that economic growth can be stimulated or induced by external savings. Since the external savings is the counterpart of current account deficit, it follows that the developing countries growth should necessarily be linked to great imbalances in the current accounts.

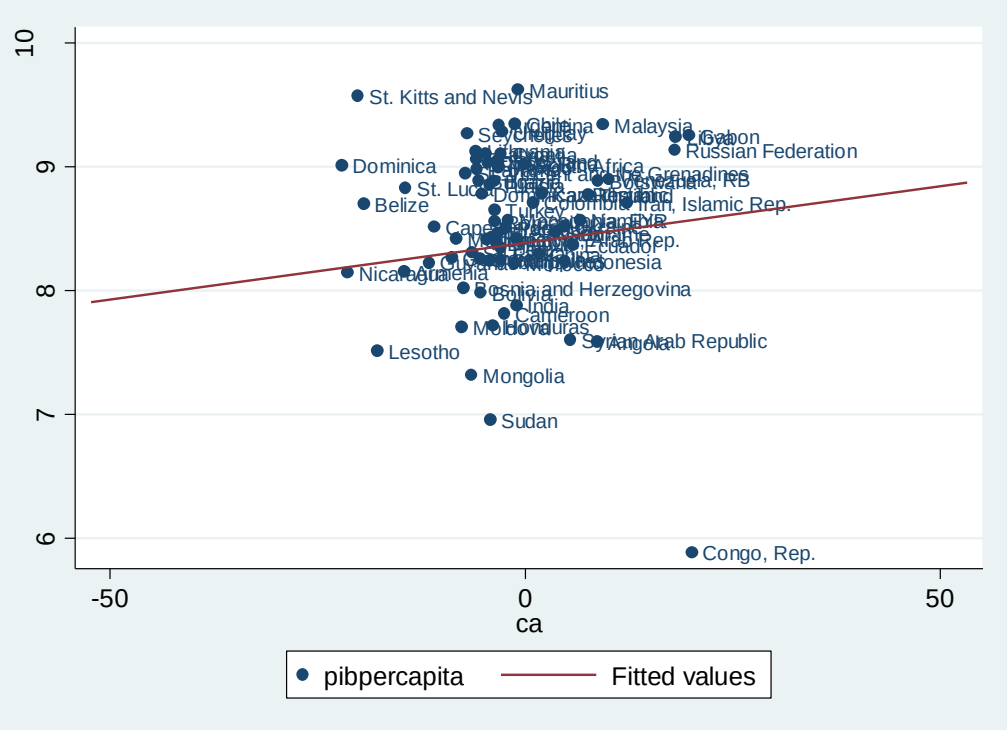
Post Keynesians economists are skeptical regarding the effects of capital account liberalization over the long-run growth. Although the balance of payments constraint is considered to be the ultimate constraint to output expansion in the post-keynesian literature of demand-led growth (Kaldor, 1977; Thirwall, 1979; Thirwall, 2002); external saving could only produce a temporary increase in the rate of growth that is compatible with balance of payments equilibrium. In fact, a current account deficit financed by capital flows allows a higher growth rate of imports – and, consequently, a higher rate of growth – than it would be the case if current account was balanced. However, current account deficits increases the level of external debt and the subsequent flow of external financial commitments of the economy, thereby reducing the rate of growth that is compatible with the equilibrium in the balance of payments. It can be shown that in the long-run equilibrium, where the ratio of current account deficit to domestic income is constant, the balance of payments equilibrium growth rate is unlikely to be substantially affected by the growth of capital flows (McCombie and Roberts, 2002, p.95).

Another issue regarding capital account liberalization is the financial fragility induced by this movement. Since emerging economies are, in general, incapable of borrowing in domestic currency at the international capital markets, capital inflows produce a mismatching between assets and liabilities of these economies. This problem can be worsened in the case where liabilities are of short-term maturity and assets are of long-term maturity, that is, if short-term capital flows are used to finance long-term assets, such as real estate. These problems increase the level of exposure of the economy to a currency crisis in the case of a sudden-stop of capital flows (Davidson, 2002, ch. 13; Palma, 2002). A sudden-stop can be the result of self-fulfilling prophecies in the case where short-term external debt is higher than international reserves of the country (Rodrik and Velasco, 1999). In this case, a expectation of currency devaluation will trigger larger outflows of capital, producing a larger exchange rate depreciation (independent of the exchange rate regime), which will force the Central Bank to increase interest rates (mainly in inflation targeting countries) in order to avoid a huge increase in the rate of inflation due to the pass-through effect of exchange rate to inflation. The monetary contraction will result in output loss and a substantial reduction in the rate of growth.

The link between external saving and economic growth was also analyzed by Bresser and Nakano (2003). For these economists, the external financing tends to generate a reduction of long run growth rates of emerging countries due to the "excessive" increase of external debt. As matter of fact, an external debt increase makes the emerging countries even more susceptible to balance of payment crisis, whose solution demands great devaluations of nominal and real exchange rates which in turn increases the inflation rates and induce tight monetary and fiscal policies as a way to control inflation. This dynamic makes huge trade surplus necessary for the "solution" of the balance of payments crisis, usually through cutting domestic absorption by means of very tight fiscal and monetary policies.

Figure 1 presents the scatterplot of the current account as GDP share, in the vertical axis, and the GPD growth series on the horizontal axis, for a selected sample of middle income countries for year 2000. There seems to be a positive relationship between the variables. This relation can motivate further investigation on the relationship between growth performance and foreign savings for the emerging countries[†].

Figure 1 – Scatter-plot of Current Account/GDP and GDP Growth for a Selected Middle-Income Countries



Source: Elaborated by the authors from the World Development Indicators dataset, 2008.

The objective of the present paper is to evaluate at theoretical and empirical level the hypothesis that the inflow of external savings in emerging countries can have negative impact on the macroeconomic performance of the developing countries, due to the possible occurrence of an "excessive" external indebtedness, as pointed out by

[†] Since the negative results in the Current Account results in the inflows of foreign savings, the positive relationship between Current Account and the GDP growth is the same as a negative relationship between the inflow of foreign savings and the growth of GDP.

Bresser and Nakano (2003). More specifically, in the theoretical dimension, this works aims to isolate the economic mechanisms through which the external savings, with the accumulating external debts as vehicle, can bring about a macroeconomic scenario characterized by a low profit rate levels and hence low level of capital accumulation, resulting in macroeconomic stagnation.

In order to do that, first we will first develop a post-keynesian (kaleckian) growth model for an open economy, with the following features: i) desired rate of capital accumulation is supposed to be a non-linear function of external indebtedness as share of capital stock; ii) endogenous country risk premium, which is supposed to be an increasing (linear) function of the external indebtedness (as a share of capital stock); iii) fixed exchange rate regime and perfect capital mobility in the sense of Mundell (1963) and Fleming (1962).

The main implication of the model is that the foreign savings, when accumulate external indebtedness beyond a determinate threshold, has a negative impact over the level of economic activity and over the rate of capital accumulation, resulting in a situation of economic stagnation. This result is an important contribution for post-keynesian demand led-growth literature, since it isolates a new mechanism by which external constraints can affect the long-run growth rate of capitalist economies.

To evaluate at empirical level the predictions of the model about the relation between external savings and economic growth, we will also build an empirical model of growth in the second part of the paper. The empirical test of demand-led growth equations with dynamic panel for 73 emerging countries confirms the potential negative effects of external savings over the long-run rate of growth of the countries in the sample.

Given these considerations, this paper has four sections, including this introduction. In Section 2 it is presented the basic structure of the growth model. In Section 3 is presented the dataset used and the empirical tests. The final comments are made in Section 4.

2. Capital Accumulation and External Borrowing.

In this section we will present a demand-led growth model for a small open economy that operates with a fixed exchange rate and a fully convertible capital account. Investment and exports are supposed to be the autonomous component of aggregate demand, which is in sharp contrast with the standard balance of payments constrained growth models where exports are considered to be the only source of autonomous demand for the economy as a whole (Thirwall, 2002, p.55)[‡]. For sake of simplicity, there are no government activities, so government expenditure and taxes are set in zero.

2.1 The fundamental blocks of the model

[‡] According to Kaldor (1988), in the long-run the sources of autonomous demand for the economy as a whole are given only by government expenditures and exports, since investment is supposed to be determined by the Harrodian accelerator, so that it is a fully endogenous variable in the long-run. According to our understanding of Keynesian investment theory, however, investment has a pure autonomous part, even in the long run, due to its dependence over entrepreneurs´ animal spirits. This means that it is theoretically unacceptable to treat investment as a pure endogenous variable, as it is supposed by balance of payments constrained growth models.

It is assumed an economy in which the firms produce a homogenous good using labor and imported raw materials. The production technology of the economy is represented by means of a Leontieff production function, in a way that the technical parameters of labor and commodities – that is, the amounts of labor and raw materials required to produce a unit of output – are independent of the production level of the firms. For simplicity, it is assumed an economy without technological progress so that the labor productivity – defined as the reverse of the unitary requirement of labor – is constant along the time.

Just as it is assumed in most of post-keynesian growth models, it is supposed that the firms of this economy have market power and sets the prices of their goods based on a constant mark-up over the variable unitary costs of production. Hence, the price equation of this economy is given by (Taylor, 1989, p.21):

$$p = (1+\tau)[wb + ep_0^* a_0] \quad (1)$$

Where: p is the domestic price level, w is the nominal rate of wages, p^* is the international price level, e is the nominal exchange rate, b is the unit requirement of labor, a0 is the unit requirement of imported input commodities and τ is the rate of mark-up.

Let r be the profit rate and u the level of capacity utilization. It can be shown that the profit rate is given by:

$$r = \frac{\tau}{1+\tau} u \quad 2)$$

Hence, it can be noticed that the profitability is an increasing function of markup[§] and of the degree of capacity utilization.

The good market is cleared when the aggregate demand equals the production level of the firms:

$$pC + pI + pE = pX \quad (3)$$

Where: pC is the nominal value of consumption expenditure, pI is the nominal value of investment expenditure, pE is the nominal value of net exports and pX is the nominal value of the production level.

Additionally, it is assumed the existence of two social classes (capitalists and workers) which differ by the type of income they earn (profits and wages) and by their propensity to consume out of the disposable income. As in Kaldor (1956), it is assumed that the workers "consume all they get" so their consumption propensity is equal to one[**] and, at the same time, capitalists consume a constant fraction of their income (which is solely made of profits), saving a fraction sc of their income. Hence, the nominal value of the consumption expenditure is given by:

$$pC = wbX + (1-s_c)rpK \quad (4)$$

[§] The mark-up rate is taken as given since it depends upon structural factors as: i) the degree of monopoly of the firms of the economy; ii) the level of entry barriers to new firms in the industry; and iii) the degree of substitution between the products of a given industry.

[**] That is, its propensity to save is equal to zero.

By substituting (4) in (3):

$$\frac{I}{K} + \frac{E}{K} - s_c r - q a_0 m r = 0 \qquad (5)$$

Where $q = \frac{ep^*}{p}$ is the real exchange rate and $m = \frac{\tau}{1+\tau}$ is the profit share of income.

In this model, the rate of growth of capital stock (I/K = g) that is desired by capitalists is a positive function of an autonomous component (α_0)[††], of the difference between profit rate and interest rate ($\alpha_1[r-i]$)[‡‡] and of a component that depends upon the external indebtedness g as share of the capital stock ($\alpha_2 z^{\psi}$)[§§]. It will be assumed that an increase in the external borrowing as a share of capital stock will result in a less than proportional increase in I/K, that is, $\psi<1$[***].

$$\frac{I}{K} = \alpha_0 + \alpha_1[r-i] + \alpha_2 z^{\psi} \qquad 0 < \psi < 1 \qquad (6)$$

Equation (6) assumes a conventional keynesian hypothesis that investment decisions is positively influenced by the difference between the current profit rate – which is a proxy of the expected rate of return for new planned investment (Possas, 1987) – and the nominal rate of interest[†††]. The new element in the investment function here is the inclusion of external debt as a share of capital stock. This addition to the investment function has the meaning to formalize *the existence of an external constraint to economic growth and capital accumulation*[‡‡‡]. As a matter of fact, as it is underlined in Bresser and Nakano (2003, p.14), investment expenditure is restricted, in an open emerging economy, by the capacity to import capital goods from developed economies.

[††] This refers, for instance, to the capitalist's "animal spirits". To get an understating of this concept, see Keynes (1936, ch. 12).

[‡‡] The first two components of the investment demand function are the standard formulation of investment decision according to the so-called neo (post) keynesian approach to growth and distribution (Marglin, 1984, pp. 81-95).

[§§] z=D/K is the external indebtedness as a share of capital stock.

[***] This happens because we are assuming, in according with the experience of emerging countries, that part of foreign capital flows is used to acquire non-reproducible assets as, for example, land.

[†††] For the sake of simplicity, we are supposing that the expected rate of inflation is equal to zero.

[‡‡‡] We are introducing the external constraint to economic growth in a manner that is different from the conventional balance-of-payments constrained growth models, such as one developed by Moreno-Brid (1998). In fact, Moreno-Brid analyzed the impact of capital flows over balance of payments constraint, but leaves open the question about the determinants of effective growth rate. This means that in the long-run equilibrium, it is possible that effective growth rate – largely determined by the desired rate of capital accumulation – is lower than balance-of-payments equilibrium growth rate. In such a case, capital accumulation and economic growth will be independent of capital flows, what seems to be in contradiction with the empirical evidence of emerging economies.

According to this line of reason, the external borrowing can ease the foreign exchange restriction to capital goods imports, stimulating capital accumulation. In equation (6) we are using the stock of external debt as a proxy for the inflow of capital to the economy at hand[§§§].

It can also be saw in Equation (6) that the external borrowing effect over the investment rate is non linear. More specifically, it is supposed that an increase in the external indebtedness as a share of capital stock will generate a less than proportional increase in the investment rate. This hypothesis can be justified by the idea that capital flows are not fully devoted to finance fixed capital investment, but are also used, for instance, to finance government debt or real estate. Hence, the external indebtedness will not result in a proportional increase in the investment rate.

The net exports are a positive function of an autonomous component (ε_0)[****] and a negative function of the level of capacity use, since it is supposed that the increase in the level of economic activity implies an increase of imports, which reduces the trade balance. Hence, it can be written the following equation[††††]:

$$\frac{E}{K} = \varepsilon_0 - \varepsilon_1 u \tag{7}$$

The country risk premium is supposed to be endogenous and given by the following equation:

$$\rho = \rho_0 + \rho_1 . z \tag{8}$$

Where: $\rho_0 > 0$; e $\rho_1 > 0$.

Equation (8) shows that the country risk premium risk is an increasing function of the level of external debt as a ratio to capital stock. The implicit idea in this reasoning is that as larger the external indebtedness is bigger will be the flow of external financial commitments of the country, increasing the risk of default risk over external debt (Oreiro, 2004).

To close the model, it is necessary to specify the determinants of domestic interest rate. In order to do that, it is assumed that the economy at hand has full convertibility of its capital account – that is, it is supposed that there is free capital mobility in the sense of Mundell (1963) and Fleming (1962). We will also assume the existence of a fixed exchange rate regime. In this setting, the nominal interest rate is determined in the uncovered interest rate parity theorem, which is given for the following equation:

$$i = i^* + \rho \tag{9}$$

[§§§] This will happen if lenders in international capital markets desire a constant rate of growth for assets denominated in currencies of emerging economies. In fact, let d to be the rate of growth of capital flows for a specific emerging economy. Then d = FKF/D, where FKF is foreign capital flow. This means that D = FKF/d and z = D/K = (1/d)*(FKF/K).

[****] This depends upon the real exchange rate, among other variables. Since we are assuming the existence of a pegged currency regime and price rigidity in domestic and international levels, it follows that the real exchange rate can be treated as constant and hence be incorporated to the autonomous component of the net export function.

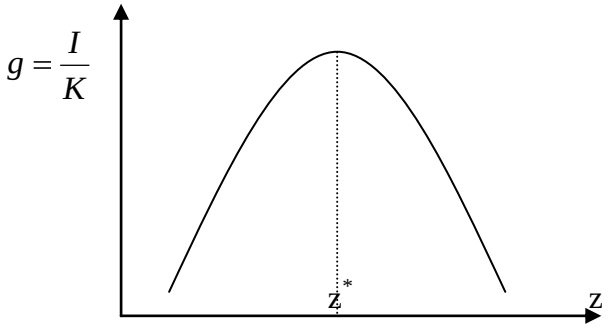
[††††] In this model, the nominal and real exchange rate are supposed to be constant and captured by the term ε_0.

Substituting (8) and (9) into (6), it is obtained an equation that defines investment as a ratio to capital stock as function of the external indebtedness and profitability of the economy:

$$\frac{I}{K} = g = \alpha_0 + \alpha_1[r - (i^* + \rho_0 + \rho_1 z)] + \alpha_2 z^{\psi} \tag{10}$$

Hence, the relationship between the growth rate of capital stock and the external indebtedness can be seen in Figure 2.

Figure 2 – Growth rate as function of external indebtedness



Taking the total derivative of (10), it can be shown that:

$$\frac{\partial g}{\partial z} = \psi \alpha_2 z^{\psi - 1} - \alpha_1 \rho_1 \tag{11}$$

Solving for *u* in equation (2) and substituting the resulting equation into (7), we arrive at:

$$\frac{E}{K} = \varepsilon_0 - \varepsilon_1 \frac{(1+\tau)}{\tau} r \tag{12}$$

By substituting (10) and (12) into (5), we define the locus r = 0 by the following equation:

$$0 = \gamma + \alpha_1 r + \alpha_2 z^{\psi} - \alpha_1 (i^* + \rho_0 + \rho_1 z) - \varepsilon_1 m^{-1} r - s_c r - q a_0 m r \tag{13}$$

Where: $\gamma \equiv \alpha_0 + \varepsilon_0$.

Equation (13) shows the value of the rate of profit for which aggregate demand is equal to the level of production. This is the short run equilibrium value for the profit rate.

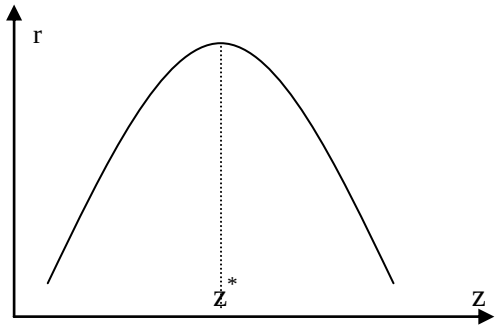
Solving for *r* in equation (13) and taking the first derivatives in respect to *r* and *z*, it is obtained the following expression:

$$\left(\frac{\partial r}{\partial z}\right)_{r=0}^{\cdot} = \left(\frac{m(\psi\alpha_2 z^{\psi-1} - \alpha_1\rho_1)}{\varepsilon_1 + s_c m + qa_0 m^2 - \alpha_1 m}\right) \quad (14)$$

The sign of $\left(\frac{\partial r}{\partial z}\right)_{r=0}^{\cdot}$ will depend upon $\psi\alpha_2 z^{\psi-1} - \alpha_1\rho_1$, which varies with *z*. Hence, the larger *z* becomes; the sign of $\frac{\partial r}{\partial z}$ changes from positive to negative. This behavior characterizes a non-linear relationship between profitability and external indebtedness.

The relationship between external indebtedness and profitability can be seen in the Figure 3.

Figure 3 – Profitability as a function of the level of external indebtedness



2.2 – External indebtedness and multiple equilibrium: the long run dynamics of the model.

The dynamic behavior of external indebtedness is given by (Simonsen and Cysne, 1995):

$$\dot{D} = i^e D - H \quad (15)$$

Where: *D* is the stock of total external debt, *H* is the net resources transfer to abroad and i^e is the nominal interest rate of the external debt. The nominal interest rate of the external debt is given by the following equation:

$$i^e = i^* + \rho_0 + \rho_1 z \quad (16)$$

By differing *z* with relationship to time, we get the following expression:

$$\dot{z} = \frac{\dot{D}}{K} - \frac{\dot{K}}{K}\frac{D}{K} \quad (17)$$

Where $\frac{\dot{K}}{K}$ is the growth rate of stock of capital (g)[‡‡‡‡].

By substituting (15) and (16) into (17), we get into the following expression:

$$\dot{z} = (i^e - g)\, z - \frac{H}{K} \tag{18}$$

The net foreign transfer of resources is nothing more than the net value of exports $\frac{H}{K} = \frac{E}{K}$ [§§§§]. By substituting (10) and (12) into (18), it is given the final expression for the external debt dynamics:

$$\dot{z} = (i^* + \rho_0 + \rho_1 z - \alpha_0 - \alpha_1[r - (i^* + \rho_0 + \rho_1 z)] - \alpha_2 z^{\psi})\, z - \varepsilon_0 + \varepsilon_1 m^{-1} r \tag{19}$$

Solving for *r* in Equation (9) and differentiating with respect to *r* and *z*, we get the locus z = 0:

$$\left(\frac{\partial r}{\partial z}\Big|\dot{z} = 0\right) = \left(\frac{\Phi_0 + \Phi_1 z - \alpha_2 \psi z^{\psi-1} - \alpha_2 z^{\psi}}{\varepsilon_1 - zm\alpha_1}\right) + \alpha_1 m^2 \left(\frac{\varepsilon_0 - i_p z - i_p \alpha_1 z + (i_p)\alpha_1 z + \alpha_2 z^{\psi+1}}{(\varepsilon_1 - zm\alpha_1)^2}\right) \tag{20}$$

Where:

$$\Phi_0 = i^* + \rho_0 - \alpha_0 - \alpha_1 r + \alpha i^* + \alpha_1 \rho_0 - \alpha_1 i^* - \rho_0 \alpha_1 > 0;$$

$$\Phi_1 = (\rho_1 + 2\alpha_1 \rho_1 - 2\alpha_1 \rho_1) > 0$$

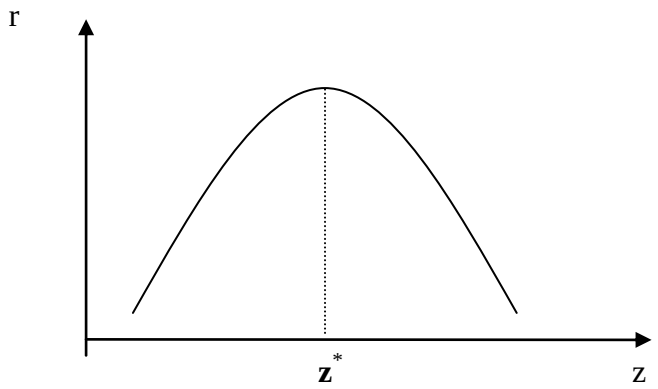
$$i_p = i^* + \rho_0 + \rho_1 z > 0.$$

Equation (20) shows that the effect of an increase of the external borrowing over the economy's profitability depends on the level of external borrowing. Assuming that $\varepsilon_1 - zm\alpha_1 > 0$; the sign of $\left(\frac{\partial r}{\partial z}\right)_{z=0}$ will depend upon the external borrowing. For a low level of *z*, the slope is positive, whereas to high levels of *z*, the slope is negative. One of the possible configurations of the locus at hand shown in Figure 4:

[‡‡‡‡] Assuming that the capital-output rate is constant along the time, it follows that the rate of real output growth is equal to the rate of growth of the capital stock.

[§§§§] We are assuming that the balance of non-factor services is equal to zero.

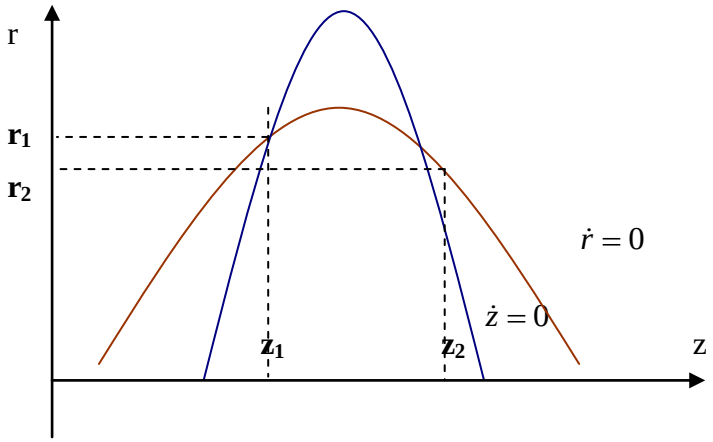
Figure 4 – Equilibrium locus of external debt



In the steady-state equilibrium, the profit rate and the external indebtedness are constant through time. This allows us to define the locus r = 0 and the locus z = 0, which each slopes are given, respectively, by equations (14) and (20).

Hence, as given by Equations (14) and (20), it can be easily shown that one of the possible configurations of the long run equilibrium of the economy under study is correspondent to what can be saw in Figure 5:

Figure 5 – Long Run Multiple Equilibrium.



In Figure 5 it can be seen the existence of two long run equilibrium positions. The first one is characterized by the existence of a high profitability (r1) and a low level of external indebtedness (z1). We will call this position of "equilibrium with low external indebtedness". The second one is characterized by a situation of low profitability (r2) and a high level of external indebtedness (z2), which we will call of "equilibrium with high external indebtedness". From this result we can conclude that

capital inflows may cause an excessive level of external indebtedness (equilibrium with high level of external indebtedness) with negative impact over profit rate and degree of capacity utilization, which determines a situation of economic stagnation. This happens because in this model, an equilibrium in which the profit rate is low configures a situation where the degree of productive capacity utilization is also low due to the supposed constancy of the rate of mark-up. Since capital accumulation rate is a positive function of the degree of productive capacity utilization and a negative function – beyond a critical level of external borrowing z* - of external indebtedness; the growth rate of capital stock will be lower than that one that would prevail in the case where economy is operating with a lower level of external indebtedness.

3. Empirical evidence

We have seen in the theoretical model that the foreign capital inflow can, through accumulating external indebtedness, have negative consequences to the growth performance of emerging countries.

The aiming of this section is to test the hypothesis that the external savings has any effects over the macroeconomic performance of emerging countries, based on a panel analysis for a 73 emerging countries data-set[*****] – according to the World Bank income countries classification – covering the period 1980-2000. The sample is constituted by low-middle income and high-middle income countries. The data comes from World Penn Tables of Heston, Summers and Atina (2006) and from the series of World Bank's World Development Indicators.

3.1 Unit Root tests

It is well known that one of major challenges to macroeconomic model estimations is the existence of unit roots or spurious regressions [see Jones (1995) and Easterly (2001)]. To small samples, the traditional unit root tests have little power against alternative hypothesis of near-stationarity. The panel data analysis reduces the problem related to the low power of these tests by increasing the number of observations. For the analysis of the variables used in the empirical tests, it is reported the results of three unit root test for panel data: the Levin, Li and Chun, the ADF of Dickey and Fuller and the Phillips-Perron. All these tests are based on some kind of Dickey Fuller regression:

$$\Delta y_{it} = \alpha_i + \rho_i y_{it-1} + \varepsilon_{it},$$

where $i = 1, ..., N$ is the country, $t = 1, ..., T$ e ε_{it} is iid $(0, \sigma_i^2)$.

[*****] The countries sample are composed by: South Africa, Albania, Argentina, Algeria, Angola, Armenia, Bulgaria, Belize, Brazil, Botswana, Chile, China, Cameroon, Congo, Colombia, Cape Verde, Costa Rica, Cuba, Djibouti, Dominica, Dominican Republic, Ecuador, Honduras, Croatia, Indonesia, India, Iran, Iraq, Jamaica, Kazaquistan, Kiribati, São Kitts, Lebanon, Libya, Saint Lucia, Sri Lanka, Lesotho, Lithuania, Latvia, Morocco, Maldives Island, Mexico, Macedonia, Mongolia, Palau, Poland, Paraguay, Romania, Russia, Sudan, El Salvador, Serbia, Suriname, Syria, Turcomenistan, Tonga, Turkey, Ukraine, Uruguay, St Vicent and Grenadines, Venezuela, Samoa.

Table 1 – Panel Unit Root Test Results

Foreign Savings		**I(0)**
Method	Statistic	Prob.**
Null: Unit root (assumes common unit root process)		
Levin, Lin & Chu t*	-2.02508	0.0214
Null: Unit root (assumes individual unit root process)		
ADF - Fisher Chi-square	6.4164	0.0404
PP - Fisher Chi-square	6.53788	0.038
ln(GDP per capita)		**I(0)**
Method	Statistic	Prob.**
Null: Unit root (assumes common unit root process)		
Levin, Lin & Chu t*	-3.36729	0.0004
Breitung t-stat	-0.43263	0.3326
Null: Unit root (assumes individual unit root process)		
Im, Pesaran and Shin W-stat	-3.25451	0.0006
ADF - Fisher Chi-square	11.7986	0.0027
PP - Fisher Chi-square	2.80242	0.2463
External Competitiveness		**I(0)**
Method	Statistic	Prob.**
Null: Unit root (assumes common unit root process)		
Levin, Lin & Chu t*	-2.74498	0.003
Null: Unit root (assumes individual unit root process)		
ADF - Fisher Chi-square	9.3011	0.0096
PP - Fisher Chi-square	6.12602	0.0467
Investiment/GDP		**I(0)**
Method	Statistic	Prob.**
Null: Unit root (assumes common unit root process)		
Levin, Lin & Chu t*	-1.41609	0.0784
Null: Unit root (assumes individual unit root process)		
Im, Pesaran and Shin W-stat	-1.36873	0.0855
ADF - Fisher Chi-square	5.2622	0.072
PP - Fisher Chi-square	3.67716	0.159

*Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

For the three tests, the null hypothesis is that all series has a unit root, that is, $\rho_i = \rho < 0 \forall i$. In Levin, Li and Chun (2003) the Levin Li test is extended to allow heterogeneity in the auto-regressive coefficients under alternative hypothesis, that is, $\rho_i = \rho < 0 \forall i$. The alternative hypothesis then can be written as $\rho_i < 0$ for i = 1, 2, N_1 and $\rho_i = 0$ for $i = N_1 + 1, ..., N$.

Hence, under the alternative hypothesis, some series can be characterized by a unit root, as another series can be said stationary. Table 1 reports the unit root test for the series used on the empirical analysis following: the results of the tests statistics points out to the stationarity of the series. All tests include trend and intercept.

3.2 Empirical model.

The idea here is to build a demand side empirical model of growth, in a Keynesian/Kaldorian fashion. Following this way, is given relevance to the growth explanation, in special, investment decision and, most importantly for emerging countries, the dynamicity and competitive capacity of the external sector of economy. The external dynamicity here is interpreted close to the real exchange rate behavior or policy of emerging countries.

To create an index of the competitive capacity of the external sector, it is estimated an real exchange rate devaluation index[†††††]. This index is the difference of the actual values of real exchange rate to is long run values, which is assessed by the predict values of a PPP exchange rate equation, corrected for Balassa-Samuelson effects. The properties of growth stimulus of devaluated real exchange rate are empirically consolidated. The real exchange devaluation index is as described in Rodrik (2008). The author creates an exchange rate misalignment index corrected by Ballassa-Samuelson effects. According to Rodrik, this measure, which has as advantage the possibility of be comparable between countries along the time, is obtained in three steps. First, it is used the XRAT nominal exchange rate series from World Penn Tables and the power parity purchase (PPP) series to calculate the real exchange rate of a country *i* in period *t*. Equation (21) shows the equation in logs:

$$\ln \theta_{it} = \ln(e_{it} / PPP_{it}) \tag{21}$$

When the real exchange rate measured is larger than one, it indicates that the money value is lower than what is predicted by power parity purchase. However, in practice the non tradable goods are cheaper in poorer countries (Balassa Samuelson effect), so a correction is needed. Hence, in second step, is regressed the real exchange rate over the RGDPCH World Penn Table series, as shown in Equation (22) – where ft is the fixed-effect for the period of time and the uit the error term.

$$\ln \theta_{it} = \alpha + \beta \ln Ypcta_{it} + f_t + u_{it} \tag{22}$$

Finally, the last step is the built the real exchange rate devaluation index measured according to Equation (23): is the difference between the actual exchange rate and the predicted values of the model estimated:

[†††††] The theoretical vehicles of propagation of the effects of real exchange devaluation on growth can be accessed in detail on Gala (2008) and, in a more conventional fashion, in Rodrik (2008).

$$\ln(\text{Re } alDevaluat ion)_{it} = \ln \theta_{it} - \ln \hat{\theta}_{it} \quad (23)$$

This index of devaluation of real exchange rate can be comparable between countries, and it is used in the empirical model estimates following as a proxy variable of external competitiveness of the economy. A fixed-effect panel regression estimates of the long-run exchange rate is reported in Table 2. The coefficient estimates of Beta is -0,133, what suggests a relatively strong Balassa-Samuelson effect: when the income increases in 10%, the real exchange rate appreciates approximately in 1.3%.

Table 2 – Long Run Real Exchange Rate with Balassa-Samuelson correction

Fixed-effects (within) regression	Number of observations = 1.195
Group variable (i): countries	Number of countries = 73

Lnθ	Coeficiente	Erro-Padrão	T	P > t
lnYpcta	-0,1333	0,0503	-2,6500	0,0080
Constante	1,9592	0,4195	4,6700	0,0000

The empirical growth equation to be estimated is as following:

$$\ln(Y/P)_{it} = \alpha + \ln(Y/P)_{it-1} + \beta_1 \ln(I/Y)_{it} + \beta_2 \ln(PEX)_{it} + \beta_3 (CEX)_{it} + OPENK_{i,t} + \psi_{i,t} + \xi_{it} \quad (24)$$

Where:

$\ln(Y/P)_{it}$ is the log of the GDP *per capita* with the Laspeyres index in 1996 basis, from *World Penn Tables 6.2* series*;*

$\ln(Y/P)_{it-1}$ is the log of the GDP *per capita* with the Laspeyres index in 1996 basis, lagged in one period, from *World Penn Tables 6.2* series*;*

$\ln(I/Y)_{it}$ is the investment as a share of GDP, *World Penn Tables 6.2* series*;*

$\ln(PEX)_{it-5}$ is a *proxy* of the foreign savings, defined as the negative ratio of Current Account series and the nominal GDP in constant prices, from *World Development Indicators on-line*. These series are lagged five years periods to capture the long run impacts over the GDP path;

$\ln(CEX)_{it}$ is an index of external competitiveness of a country *i*, built from XRAT and lnRGDPCH series from *World Penn Tables 6.2*. The construction of the index is detailed in sequence.

OPENKi,t is the index of economy's trade openness (exports+imports/GDP), from World Penn Tables 6.2 series;

ψ is a year dummies vector, with one dummy for each period covering every five-years sequence;

ξ_{it} is an stochastic residual.

Following Arellano and Bond (1991) and Blundell and Bover (1998) we estimate domestic savings using Generalized Method of Moments for a dynamic panel. These estimators try to deal with unobservable temporal effects by means of the

inclusion of time-specific intercepts. Dealing with these effects is not a trivial task. As a result, the model is dynamic and may include endogenous regressors that are controlled by means of the instruments of the difference variables.

The instruments that correspond to moment conditions are lagged both in terms of level and difference of the independent and dependent variables. Because moment conditions typically over-identify the model's regression, the dynamic panel method allows for testing different specifications with the Sargan's or Hansen's test. Using Arellano and Bover's (1995) estimators, Blundell and Bond (1998) developed a system estimator (*System*-GMM) that uses additional moment conditions. The Arellano-Bond (1991) and Blundell-Bond (1998) estimators were considered suitable to the analysis conducted here because they enable dynamic specification (allowing a lagged dependent variable) and because they appropriately instrument potentially endogenous variables. For a more detailed description of these econometric techniques, see Baltagi (2005).

Table 3 presents the results of the empirical model of growth. The specification includes a Least Squares Dummy Variable estimates, Difference-GMM and System-GMM. The Hansen and Hansen-in-Difference test of validity of the over-identification of instruments for SYS-GMM and DIFF-GMM, are as expected. The Arellano-Bond test points out to first-order correlation, but rejects the null for second order.

The positive and significant coefficients for the lagged dependent variable, in all specifications, indicate the persistence of the GDP per capita series. The positive and significant of the variable Current Account/GDP shows a positive relationship between surplus and the growth performance of emerging countries. The competitiveness index of exports shows positive and significant relationship with the macroeconomic performance of the sample countries. This result could suggest that the effects of a relatively undervalued real exchange rate are an important matter for the growth of the sample. The variable of investment, crucial to models of growth of post-keynesian *pedigree*, appears with positive and significant values for its coefficients in all specifications. The "Trade Openness" variable, which is traditionally incorporated in growth regression, also appears positive and significant.

Table 3 – Growth Equations

lnRGDPCH estimates	**LSDV**	**DIFF-GMM**	**SYS-GMM**
lnRGDPCH_1	0.976996	1.021697	1.036961
	(0.004948)*	(0.0081298)*	(0.002184)*
External Savings/GDP_5	0.033009	0.0496003	0.120381
	(0.014146)*	(0.0372164)*	(0.031424)*
ln(External Competitiveness)	0.012113	0.0368386	0.102124
	(0.00475)*	(0.0050077)*	(0.003071)*
ln(Investment/GDP)	0.011289	0.0064229	0.055934
	(0.004367)*	(0.0047278)*	(0.002825)*
Trade Openness	7.13E-05	0.0003175	0.000231
	(5.69E-05)*	(0.0001069)*	(5.82E-05)*
Year Dummies	Yes	Yes	Yes
Intercept	0.138212	...	-0.45864
	(0.039881)*	...	(0.014433)*
AR(1) Test	...	0.0000	0.0000
AR(2) Test	...	0.088	0.142
Hansen J Test	...	0.29	0.372
Difference-in-Hansen Test	...	0.25	0.68
Number of observations	1394	968	1040
Number of countries	73	65	65

* In parentheses, the standard error of the variables.

Obs: (1) Current Account and the index of competitiveness of exports are treated as endogenous variables in DIFF-GMM and SYS-GMM.

(2) Additional moments conditions was used with the level instrument variables Foreign Direct Investment and Consumer Prices Index, which prove to be good instruments for Capital Account variable in several trial specifications.

The "External Savings" variable is included as counterpart of Current Account as GDP share. The empirical model attests a negative influence of external savings for the sample countries, in all specifications. The reasons for this result can be extracted from the main message of the theoretical model in first section: external savings, since implicates in accumulation of external debts when it surpasses certain boundaries, has a negative impact over the level of economic activity.

4. Conclusion

This paper presented a non-linear dynamic model of post-keynesian features as a way to evaluate the impact of external savings over the macroeconomic performance of

emerging countries. From the conclusions of the theoretical model it follows that the influx of foreign capital, since tends to lead to "excessive external borrowing", may generate a low profit rate and a low rate of capital accumulation in the long-run equilibrium, characterizing a macroeconomic stagnation. An empirical test of the model for a sample of 73 emerging economies with a dynamic panel model confirms the potential negative effects of external savings over the long-run growth rate of the countries in the sample.

References

ARELLANO, A; BOND, B. (1991). "Some Test Specification for Panel Data: Monte Carlo Evidence and an application to employment equations". *Review of Economic Studies*.

BALTAGI, B. (2005) *Econometric Analisys of Panel Data*. John Wiley & Sons.

BLUNDEL, R; BOND**,** B.(2000). "A Estimation in Dynamic Panel Data Models: Improving on the Performance of The Standard GMM Estimators". The Institute for Fisca **BOND** l Studies.

BRESSER, L.C; NAKANO, Y. (2003). *Crescimento Econômico com Poupança Externa? Brazilian Journal of Political Economy*. Vol.23, N.2.

DAVIDSON, P. (2002). *Financial Markets, Money and the Real World.* Edward Elgar: Aldershot.

FLEMING, J.M. (1962). "Domestic Financial PoliciesUnder Fixed and Floating Exchange Rates". *International Monetary Fund Staff Papers*, 9, pp. 369-379.

GALA, P. (2008). "Real exchange rate levels and economic development: theoretical analysis and econometric evidence". *Cambridge Journal of Economics*, v. 32, p. 273-288.

HESTON A, SUMMERS R and ATEN B. (2006) *Penn World Table Version 6.2*, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.

KALDOR, N. (1956). "Alternative Theories of Distribution*"*. *Review of Economic Studies*, Vol, 23, pp.83-100.

---------- (1977). "Equilibrium Theory and Growth Theory" In: M. Boskin (ed.). *Economic and Human Welfare: essays in honor of Tibor Scitovsky*. New York: Academic Press, pp.273-291.

----------. (1988). "The Role of Effective Demand in the Short and Long-Run Growth" In: A. BARRÉRE (Ed.). *The Foundations of Keynesian Analysis.* Macmillan Press: London.

KEYNES, J.M. (1936). *The General Theory of Employment, Interest and Money*. London: Macmillan Press.

MARGLIN, S. (1984). *Growth, Distribution and Prices*. Harvard University Press: Harvard.

McCOMBIE, J.S.L; ROBERTS, M. (2002). "The Role of the Balance of Payments in Economic Growth" In SETTERFIELD, M. (ed.). *The Economics of Demand Led-Growth.* Aldershot: Edward Elgar.

MORENO-BRID, J.C. (1998-99). "On Capital Flows and The Balance of Payments Constraint Revisited". *Journal of Post Keynesian Economics, 21, pp. 283-289.*

MUNDELL, R. (1963). "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates". *Canadian Journal of Economics and Political Science*, Vol. 29, pp. 475-485.

OREIRO, J.L. (2004). "Poupança externa e performance macroeconômica". *Brazilian Journal of Political Economy*, Vol 24, N.2.

PALMA, G. (2002). "Three routes to financial crisis: the need for capital controls" In: John Eatwell and Lance Taylor (Eds.). *International Capital Markets.* Oxford University Press: Oxford.

POSSAS, M.L. (1987). *Dinâmica da Economia Capitalista*. Brasiliense: São Paulo.

RODRIK, D., (2007) "Real Exchange Rate and Economic Growth: Theory and Evidence", John F. Kennedy School of Government, Harvard University, Draft, July.

RODRIK, D; VELASCO, A. (1999). "Short Term Capital Flows". NBER Working paper, n: 7364.

SIMONSEN, M.H; CYSNE, R.P. (1995). *Macroeconomia.* Atlas: São Paulo.

THIRWALL, A.P. (1979). "The Balance of Payments Constraint as an Explanation of International Growth Rate Differences". *Banca Nazionale del Lavoro Quarterly Review*, 128, pp.45-53.

---------- (2002). *The Nature of Economic Growth*. Edward Elgar: Aldershot.