DEVELOPING COUNTRIES IN TIMES OF GLOBALIZATION: A KALECKIAN-MINSKYAN APPROACH

GABRIEL PORCILE [1]
ALEXANDRE C.GOMES DE SOUZA[2]
RICARDO VIANA[3]

Abstract: In this paper we present a Kaleckian model which discusses the conditions leading to an external crisis in a small open developing economy fully integrated to the international goods and financial markets. We discuss how the key variables of a Kaleckian macrodynamic model, and particularly the external debt to GDP ratio, evolve when both purchasing power parity and uncovered interest rate parity apply. The government may choose between two kinds of policies, an inflation rate target or a real exchange rate target. The paper discusses how these alternative policies affect the possibility of a Minskyan endogenous transition from hedge to Ponzi finance in the external debt.

Key Words: Globalization, Open Economy, External Crisis

JEL Classification: E12, E58, F43

Resumo: Neste artigo apresentamos um modelo Kaleckiano que discute as condições nas quais crises externas podem surgir numa pequena economia aberta em desenvolvimento, completamente integrada aos mercados internacionais de bens e financeiros. Especificamente, procuramos entender como as variáveis-chave de um modelo macrodinâmico Kaleckiano, e em particular a relação dívida externa/PIB, se comportam quando são simultaneamente válidas a paridade do poder de compra e a paridade descoberta de juros. O governo pode escolher entre duas políticas: metas de inflação ou metas de taxa de câmbio real. O trabalho procura identificar as condições para a emergência endógena de finanças Ponzi no débito externo nos dois cenários alternativos de políticas.

Palavras-Chaves: Globalização, Economia Aberta, Crise Externa

Area 6: Economia Internacional

[1] Department of Economics, Federal University of Paraná, and Reseacher of CNPq, Brazil. Email: porcile@ufpr.br
[2] Department of Economics, Banco Central do Brasil, and PhD Candidate, Federal University of Paraná. Email:alexandrecgs@gmail.com. The views expressed in this work are those of the authors and do not necessarily reflect those from Banco Central do Brasil or its members.
[3] Department of Physics, Federal University of Paraná, Brazil. Email: viana@fisica.ufpr.br

INTRODUCTION

In the last three decades and especially from the 1990s the Latin American economies have become much more integrated to international trade and financial markets. This integration has made it more complicated for the region to foster growth and at the same time reduce the impact on the domestic economy of external financial and exchange turbulences. Latin America is particularly prone to experience severe external crises, a point which has been traditionally stressed by the structuralist tradition[4]. The devastating effects of the 1982 debt crisis throughout the region (following the Mexican default) and the more recent crises in Mexico (1994), Brazil (1999) and Argentine (2002) have confirmed this view. Recently, the external constraint had been considerable eased for some Latin American countries[5] in the context of a vigorous expansion of the world economy and of improving terms of trade for several commodities. But the Latin American economic history and the beginning of a world crisis whose magnitude is still unknown (following the subprime crisis in the USA) suggest that external instability is by no means a matter of the past.

In this paper we present a model which discusses the conditions in which an external crisis may emerge in a small developing economy immersed in the global economy. More specifically, we build on the Minskyan tradition of financial crisis to discuss how a country may be endogenously driven towards a situation of Ponzi finance in its external debt in a context in which exchange and interest rates are arbitrated by the international economy. Minskyan crises are defined as situations in which firms which have manageable debts endogenously move towards an unsustainable debt to capital relation, switching from hedge to speculative and eventually to Ponzi finance, according to the Minskyan typology of finance positions.[6] The evolution from hedge to Ponzi finance has strong macroeconomic implications as it is related to a

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[4] See, among others, Prebisch (1950), Furtado (1979), Rodríguez(1980); Ffrench-David and Griffith-Jones (1997), ECLAC (2001), Frenkel and Taylor (2006).

[5] The impact of the expansion of the world economy has not been uniform across Latin America. Countries like Argentina, Brazil and Mexico, which are well endowed with natural resources, have experienced a positive shock. On the other hand, the small Central American countries, whose comparative advantage depends largely on cheap labor, have suffered from declining terms of trade and increasing Chinese competition in the US market (ECLAC, 2008).

[6] Hedge finance means that firms' profits are high enough to pay for its financial commitments at any point in time. Speculative finance means that profits suffice to pay for the interests of the debt, but firms have to reschedule the payment of the principal. Ponzi finance, in turn, emerges when firms have to contract new debt to pay for the interests, giving rise to increasing financial vulnerability and potential instability (Minsky, 1975;1986)

cyclical pattern in which rapid growth is followed by the collapse of investment and credit and by debt deflation (MINSKY, 1986). In the short run there is a considerable loss of employment and production; in the long run, this cyclical pattern may destroy capabilities and reduce productivity growth, particularly in catching up economies (see Ffrench-David, 1999; Cimoli and Porcile, 2008).

There is already a rich literature on models of Minskyan crisis and post-keynesian models addressing key problems in monetary policy which is the basis of this paper[7]. Our objective is to make contributions to this debate by analyzing the conditions for the emergence of Ponzi finance in a globalized economy, defined as one in which both purchasing power parity (PPP) and uncovered interest rate parity (UIP) hold. We assume that governments have two policy options as regards the setting of the nominal interest rate. One is to adopt a Taylor-rule with a view to achieving a certain desired level of inflation (inflation target), while the real exchange rate endogenously adjusts. The other one is to aim at a real exchange rate target, while the equilibrium inflation rate is endogenous. We discuss which of these two alternative policies is more likely to favor growth and stability.

The paper is organized three sections besides the introduction and the concluding remarks. Section 1 presents the basic Kaleckian equations for the determination of GDP as a function of investment decisions. Section 2 discusses the conditions for external equilibrium in different policy settings when the economy is fully integrated to the world economy. In addition, it discusses inflation target in a context in which there is less integration with international financial markets.

1. THE BASIC KALECKIAN MODEL WITH EXTERNAL DEBT

1.1 THE SHORT RUN EQUILIBRIUM

We assume an open economy in which there is no fiscal policy. The role of the government is confined to set the inflation or exchange rate target and the nominal interest rate

[7] See for instance Minsky (1975), Taylor and O'Connel (1985), Dymski and Pollin (1994), Foley (2003), Setterfield (2004), Meirelles and Lima (2006), Lima and Meirelles (2007). There are also several Post-Keynesian models addressing key problems in monetary policy, as in Hein and Stockhammer (2007), Lavoie and Seccareccia (2004) and Setterfield (2006).

with a view to securing these targets Taking as a point of departure the basic macroeconomic identities (1) and (2), and assuming that workers do not save, we obtain equation (3).

(1) $Y = C + I + BC$

(2) $Y = W + P$

(3) $C = W + (1 - s)P$

Y is GDP, C is aggregate consumption, I is total investment, BC the current account balance, P are profits, W are wages and s is the (exogenous) savings rate. All variables are defined in real terms.

The investment function is Kaleckian: the rate of growth of the capital stock is a function of the difference between the expected profit rate (r^e) and the real interest rate (i_r), plus an autonomous component (g_0) which can be broadly seen as reflecting the Keynesian "animal spirit".

(4) $\frac{I}{K} = g = g_0 + h(r^e - i_r)$

Real net exports are a function of the total capital stock of the economy, the real exchange rate (defined as $q = ep^*/p$, where p are domestic prices, p^* foreign prices and e the nominal exchange rate) and the propensity to import (m)[8]:

(5) $BC = (aq - m)K$

Based on the Fisher equation and making $i_r\pi \cong 0$, the real interest rate can be written in terms of the nominal interest rate (i_n) and the inflation rate (π):

(6) $i_r = i_n - \pi$

[8] For a similar specification, see Basu (1984) .

Equations from (1) to (6) allows for finding the equilibrium profit rate *r* (where *r* = *P*/*K*) and the equilibrium rate of capital accumulation *g* (where *g* = *I*/*K*) as functions of the real exchange rate, the nominal interest rate and a set of positive exogenous parameters (*a*, *s*, *h*, *m*, g_0).

(7) $r = \frac{g_0 - h(i_n - \pi) + aq - m}{s - h}$

Rearranging terms in (7) and (4) gives:

(8) $g = \frac{1}{s-h}\{g_0 s + h[aq - m - (i_n - \pi)s]\}$

Equation (8) can be rewritten as a Kaleckian IS curve:

(9) $g = A + B(aq - m) - C(i_n - \pi)$

where $A \equiv \frac{g_o s}{s-h}$, $B \equiv \frac{h}{s-h}$ and $C \equiv \frac{hs}{s-h}$.

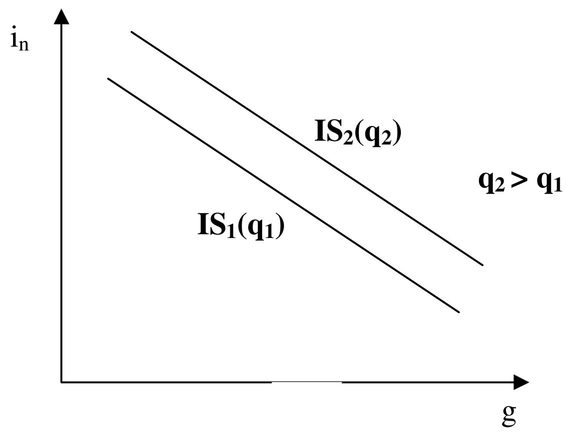
Considering the following equation (16) and differentiating (9) by q and i_n, we get:

$$\frac{dg}{dq} = Baq + C\frac{d\pi(i_n, q)}{dq} = Baq + Cu > 0 \quad \text{and}$$

$$\frac{dg}{di_n} = C\left(-1 + \frac{d\pi(i_n, q)}{di_n}\right) = C(-1 - v) < 0$$

Equation (9) represents equilibrium in the goods market, in the sense that aggregate demand and supply are equal (a dynamic IS curve), as show in Graphs 1.

Graphs 1– IS curve – Short-Term Equilibrium



Still, this is a short run equilibrium that may not be sustainable depending on the dynamics of the external sector and on the inflation rate. It is then necessary to discuss how the real exchange rate, the nominal interest rate and the inflation rate vary to produce the long run equilibrium and whether this equilibrium is stable or not. This is the topic of the next items.

1.2 THE DEBT TO CAPITAL RATIO

External equilibrium requires not only Balance-of-Payments equilibrium but also the stability of the debt to capital ratio of the economy. We assume that the external debt is issued in the international market at the nominal international interest rate $i*$ plus a risk premium R. The perception of risk is formalized as a function of the debt to capital ratio, $R = \phi\delta$. There is an infinite capital supply at the interest rate ($i* + R$).

The change in the total nominal debt (in the currency of the Home country) depends on net exports and the payment of interests on the accumulated debt[9]:

$$(10)\quad \frac{d(D\ p)}{dt} = -(aq - m)K\ p + (i * + R)(D\ p * e)$$

[9] For a similar specification, see Simonsen and Cysne (2007, p.90)

In equation (10) p represents the domestic price level and p^* is the international price level. Note that $d(Dp)/dt = \dot{D}p + \dot{p}D$ and hence $\frac{d(Dp)}{pdt} = \dot{D} + D\pi$. Therefore the evolution of the real external debt D (expressed in units of the borrowing country product) may be written as follows:

(10´) $\dot{D} = -(aq - m)K + D\left[(i^* + R)q - \pi\right]$

The real debt to capital stock ratio is $\delta = D/K$. The rate of growth of δ is as follows:

(11) $\hat{\delta} = \hat{D} - g$.

Dividing equation (10´) by D, and using (11), we get the equation of motion of the real external debt to capital ratio (in terms of the Home country product):

(12) $\dot{\delta} = m - aq + \delta\left[(i^* + \phi\delta)q - \pi - g\right]$

Recalling that g is a function of i_n, π and q, then the evolution of δ depends directly and indirectly on these three variables. A higher inflation rate reduces the real burden of the external debt, while an increase in the real exchange rate heightens it.

1.3 INTERESTS AND EXCHANGE RATES IN A GLOBALIZED ECONOMY

In a world economy featuring highly liquid financial markets the uncovered interest parity (UIP) condition must hold. According to this condition, the difference between the domestic and the international nominal interest rates should equal the expected rate of devaluation (i.e. the expected rise in the nominal exchange rate) plus the risk bonus R, as stated in equation (13):

(13) $i_n = i^* + \hat{e} + \phi\delta$

In turn, domestic and foreign prices are set in the international markets for tradables (we will not consider the influence of nontradables in this paper). It is generally accepted that in the long run it is valid the principle of purchasing power parity (PPP), which states that the real exchange rate fluctuates around a stable equilibrium ($\hat{q} = 0$). The stability of the real exchange rate requires that nominal exchange devaluations compensate for the difference between the domestic and international inflation rates (π-π*). In effect, by log-differentiating the real exchange rate $q = p^*e/p$, we have:

(14) $\hat{q} = \pi^* + \hat{e} - \pi$

Using equation (13) in (14) renders:

(15) $\hat{q} = (i_n - i^*) + (\pi^* - \pi) - \phi\delta$

When $\hat{q} = 0$ in equation (15) the principle of purchasing power parity and the uncovered interest parity condition are both satisfied at the same time. Throughout the paper we will assume that $\phi = 0$, which strongly simplifies the analysis

Last but not least, we need an equation for the inflation rate. We will assume that it responds to two variables. From one hand, inflation is related to the real interest rate. A lower i_r favors the expansion of investment and consumption and part of this pressure on the goods markets goes to prices. On the other hand, inflation also depends on the real exchange rate. The latter effect is related to a key dimension in most macroeconomic models, namely the role of the distributive conflict in inflation. A depreciation of the real exchange rate implies a rise in the price of imported inputs and consumption goods. If the mark-up is constant, more expensive inputs would lead to higher prices ("pass-through effect"). Moreover, if some of the imported goods are part of the consumption basket of workers, then the latter will demand higher nominal wages with a view to avoiding real losses. Both effects fuel inflation. Finally, since there is a unique relation between nominal and real interest rates, we can write the inflation rate as a function of the nominal interest rate and the real exchange rate, as in equation (16)[10]:

[10] A similar equation can be found in Setterfield (2004b, p.41)

(16) $\pi = uq - vi_n$

where : $\dfrac{d\pi}{dq} = u > 0$ and $\dfrac{d\pi}{di_n} = -v < 0$

We will assume that the developing economy is integrated to the global economy in such a way that $\hat{q} = 0$ in equation (15) is always satisfied. This is the meaning given in this paper to the expression "fully globalized economy": it complies with PPP and UIP at any moment. This is a strong assumption, but we believe it is an useful representation of small developing economies. In this specific case we cannot distinguish long run and short run, since the velocity of adjustment towards PPP and UIP is very high. Therefore will be true that:

(17) $i_n = i^* - \pi^* + \pi$

Equation (17) is the well known condition of equality of between the domestic and foreign real interest rates[11]. In the following section we include in the analysis the dynamics of the nominal interest rate, which is the variable under control of the Central Bank.

2. INFLATION TARGET AND REAL EXCHANGE RATE TARGET IN A FULLY GLOBALIZED ECONOMY

So far we have two differential equations (one related to the evolution of the real exchange rate through time (equation 15) and the other the evolution of the debt to capital ratio (equation 12)), a function for the inflation rate (equation 16) and a set of given parameters (*a*, *s*, *h*, *m*, g_0, π^*, i^*, *u, v, A*, *B* and *C*). But there is still one more endogenous variable whose behavior has not been specified, namely the domestic nominal interest rate. To discuss this variable we assume that the government may choose between two types of policy: inflation target and real exchange rate target.

[11] Another way to understand this equation is that under PPP and UIP conditions the maximum that Central Bank can really do is to establish the national real interest rate equal to the international ones ($i_r = i_r^*$).

2.1 INFLATION TARGET

Let us initially assume that the government has an inflation target ($\overline{\pi}$): the Central Bank takes decisions as regards the nominal interest rate according with a simple Taylor rule:

$$(18)\quad \frac{di_n}{dt} = \alpha(\pi - \overline{\pi})$$

In the fully globalized small open economy it will be valid equation (17), which we use in the Taylor rule (18):

$$(19)\quad \frac{di_n}{dt} = \alpha(i_n - \overline{\pi} - i^* + \pi^*) = \alpha[(i_n - \overline{\pi}) - (i^* - \pi^*)] = \alpha(i_r - i_r^*)$$

Equations (12) and (19) form a system of differential equations whose equilibrium values, given equations (16) and (17), are the following:

$$(20)\quad i_n^E = i^* - \pi^* + \overline{\pi}$$

$$(21)\quad q^E = \frac{v(i^* - \pi^*) + (1+v)\overline{\pi}}{u}$$

$$(22)\quad \delta^E = \frac{aq^E - m}{(i^* - q^E) - \overline{\pi} - g(i_n^E, q^E)}$$

Using these results in (9) renders:

$$(23)\quad g(i_n^E, q^E) = A + B(aq^E - m) - C(i_n^E - \overline{\pi})$$

The Jacobian is as follows:

$$\text{(24)}\quad J = \begin{vmatrix} i^*q-\bar{\pi}-g(i_n,q) & -a\frac{1+v}{u}+\delta\,[i^*\frac{1+v}{u}-g'(i_n)] \\ 0 & \alpha \end{vmatrix}$$

The trace of the system is $i^*q-\bar{\pi}-g+\alpha$ and the determinant is $\alpha(i^*q-\bar{\pi}-g)$. Note that if $i^*q-\bar{\pi}-g$ is negative (and higher in absolute value than α), then the determinant is negative as well and we have a saddle point equilibrium. If on the other hand $i^*q-\bar{\pi}-g$ is positive then the determinant is positive and the system will be unstable. Therefore in both cases we do not have a stable equilibrium - except in the very specific case in which the initial values lie precisely in the stable branch of the saddle point. As a result, we will see an international economy formed by two types of countries – those which are in a virtuous path of growth with an increasingly lower debt to capital ratio, and those which moves towards Ponzi finance in the external front. In none of the two cases the inflation target would be attained.

2.2 EXCHANGE RATE TARGET

We will now assume that the government is firmly committed to a fixed *real* exchange rate. A plausible rationale for this target is the government commitment to avoid any loss of international competitiveness derived from a fall in the real exchange rate. As mentioned, China, Germany and Brazil are examples of countries which in different periods embraced this type of policy. A form by which the government can manage the real exchange rate is using equation (15) so as to define the nominal interest rate compatible with the target real exchange rate. By using equations (16) and (17), the real exchange rate target can be written as a function of the nominal interest rate:

$$\text{(25)}\quad \bar{q} = \frac{-i^*+\pi^*+(1+v)\bar{i_n}}{u}$$

Once defined the value of $\bar{q}$ (the real exchange rate target), the target nominal interest rate $\bar{i_n}$ is automatically defined through equation (25). If the real exchange rate is higher than the target ($q>\bar{q}$), then the nominal interest rate is higher than the target ($i_n>\bar{i_n}$) and the government should reduce the nominal interest rate. The response function of the government can be formally represented as follows (with $\xi > 0$):

(26) $$\frac{di_n}{dt} = -\xi \; \left[q - \overline{q}\right]$$

Using equation (25) in (26) gives a new policy rule for the interest rate:

(27) $$\frac{di_n}{dt} = -\xi \; \left[i_n - \overline{i_n}\right] = -\xi \left[i_n - \frac{\left(i^* - \pi^* + u\overline{q}\right)}{1+v}\right]$$

We now have a system of differential equations formed by equation (27) and a slightly modified equation for the dynamics of the debt to capital ratio:

(28) $$\dot{\delta} = m - a\overline{q} + \delta\left[i^*\overline{q} - \pi(\overline{q}, i_n) - g(\overline{q}, i_n)\right]$$

The Jacobian of this system is as follows:

(29) $$\text{J}=\begin{vmatrix} i^*\overline{q} - \pi - g & \delta\left[-v - g'(\overline{q}, i_n)\right] \\ 0 & -\xi \end{vmatrix}$$

Note that in this case suffices a negative trace ($i^*\overline{q} - \pi - g - \xi$ < 0) to have a stable equilibrium. Since $-\xi$ is always negative, we will refer to the term ($i^*\overline{q} - \pi - g$) of the trace as the stability condition (SC), that must be negative to guarantee a stable equilibrium, i.e., SC <0.

We will look more carefully at the influence of an increase in the real exchange rate target on the stability of the system by taking the derivative of the stability condition SC with respect to $\overline{q}$. If the derivative is negative, an increase in $\overline{q}$ reduces SC in which case currency depreciations favors stability. In effect:

(30) $$\frac{d\left[i^*\overline{q} - \pi - g(\overline{q}) - \xi\right]}{d\overline{q}} = i^* - Ba - u(C+1)$$

If $i^* < Ba + u(C+1)$, then a higher real exchange rate makes the system more stable. We will assume in this paper that this condition holds. It is interesting to note that $\bar{q}$ should be higher than a critical value for the system to be stable. To find this critical value, we apply equations (9) and (16) in the stability condition:

$$(30)\quad \bar{q}_c > \frac{i_n[C+(C+1)v] - A + Bm}{i^* - Ba - (C+1)u}$$

If the government sets the real exchange rate bellow this critical value the system becomes unstable. Thus, in a small open economy fully integrated to the international financial markets, the real exchange rate policy does matter. A mistake in managing this variable may give rise to a cumulative process in indebtedness and instability.

2.3 INFLATION TARGET REGIME WITH REAL EXCHANGE RATE RIGIDITY: A NOT-SO-FULLY INTEGRATED INTERNATIONAL ECONOMY

What does happen if the economy is less globalized in the sense that domestic forces define the real exchange rate and in addition equation (15) is dismissed (at least in a short term horizon)? In this case we have the following 2x2 system of differential equations:

$$(31)\quad \dot{\delta} = m - a\tilde{q} + \delta\ \left(i^*\tilde{q} - u\tilde{q} + vi_n - g\right)$$

$$(32)\quad \frac{di_n}{dt} = \alpha\ (u\tilde{q} - vi_n - \bar{\pi})$$

Note that now in the Taylor rule the real exchange rate is given by a short run constant ($\tilde{q}$) different from the long run real exchange rate $\bar{q}$ that guarantee the PPP and UIP conditions. The Jacobian matrix of the new system is therefore:

$$J = \begin{pmatrix} (i^{*} - u)\tilde{q} + vi_n - g(\tilde{q}, i_n) & v - g'(\tilde{q}, i_n) \\ 0 & -\alpha v \end{pmatrix} \quad (33)$$

Recalling that in equilibrium $\overline{\pi} = u\tilde{q} - vi_n$, a sufficient condition for having a stable equilibrium is:

$$\text{SC} = i^{*}\tilde{q} - \overline{\pi} - g(\tilde{q}, i_n) < 0 \quad (34)$$

SC is the stability condition. In this case the trace of the Jacobian is unambiguously negative and the determinant is positive. The equilibrium values of i_n and δ are given by:

$$\delta^{E} = \frac{a\tilde{q} - m}{i^{*}\tilde{q} - \overline{\pi} - g(i_n{}^{E})} \quad (35)$$

$$i_n{}^{E} = \frac{u\tilde{q} - \overline{\pi}}{v} \quad (36)$$

And the equilibrium rate of growth is:

$$g^{E} = A - Bm + C\left(1 + \frac{1}{v}\right)\overline{\pi} + \left(Ba - C\frac{u}{v}\right)\tilde{q} \quad (37)$$

The influence of exogenous changes in the parameters of the model on the equilibrium values of the endogenous variables are presented in Table 1.

Table 1. Impact of Parameter Changes on Equilibrium Values

Variable/Parameters	$\overline{\pi}$	$\tilde{q}$
i^E	(-)	(+)
δ^E	(-)	(-)*
g^E	(+)	(+) **

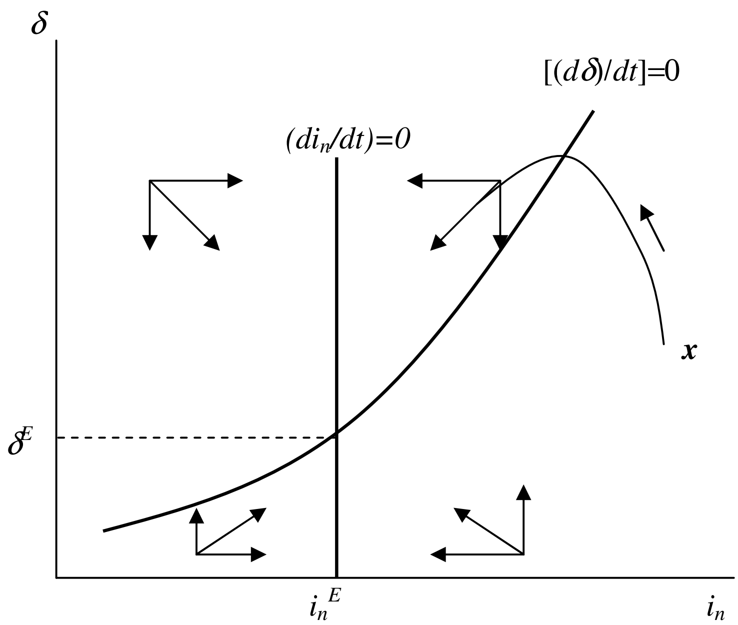
* If $i^* < a(\pi + g)/m$

** If $Ba > Cu/v$

Graph 2 illustrates the process of adjustment to equilibrium. The isocline $\dot{\delta} = 0$ implies $\delta = (a\tilde{q} - m)/((i^* - u)\tilde{q} + vi_n - g)$, which is positively sloped (i.e., δ increases with i_n)[12]. Taking point x as the initial condition, it can be seen that at this point the nominal interest rate is very high, boosting the debt to capital ratio by reducing economic growth. Still, the nominal interest rate is falling since the inflation rate is lower than the target inflation rate. Both the fall in the interest rate and the increase of inflation (which moves upwards, in the direction of the inflation target) reduce the real interest rate, fostering investment and hence capital accumulation. Lower interest rates and higher growth lead the economy to a point in which debt to capital ratio begins to fall (crossing the $d\delta/dt$ = 0 isocline). When this happens, the debt to capital ratio and the domestic interest rate gradually evolves towards their (lower) equilibrium values.

[12] The derivative $\delta(\dot{\delta})/\delta i = (m - a\tilde{q})/[(i^* - u)\tilde{q} + vi_n - g]^2$ will be positive if $(m - a\tilde{q})(v - g'(i_n))$ is positive. If $v > g'(i_n)$, and if the developing country shows a deficit in the trade balance so that $(m - a\tilde{q}) > 0$, then the isocline of the debt to capital ratio will be upward sloping in the $(\delta, i)_n$ space.

Graph 2. Phase Diagram With Real Exchange Rate Rigidity

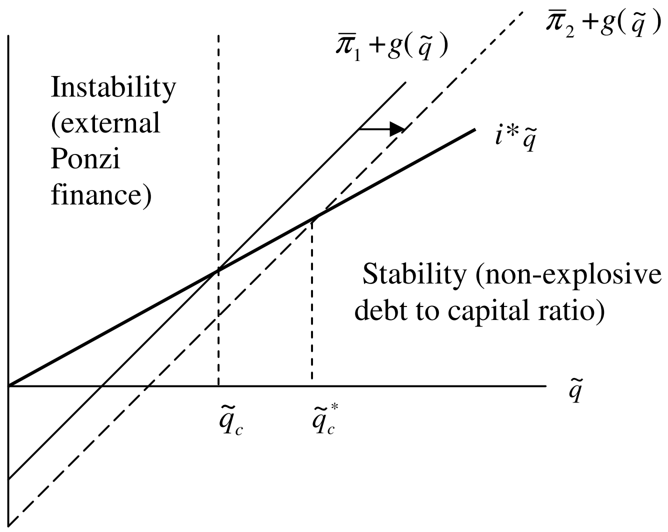


Another interesting aspect is that there is a critical threshold for the real exchange rate, below which the system becomes unstable. If we write the equilibrium value of $SC = i^*\tilde{q} - g - \bar{\pi}$ as a function of $\tilde{q}$ and considering equation (37) we find that for having a negative SC is necessary that:

$$(38) \quad \tilde{q}_c > \frac{-Av - \bar{\pi}(v + vc + c) + Bmv}{Cu + i^*v - vaB}$$

Values of the real exchange rate higher than $\tilde{q}_c$ assure that equation (34) is negative. This value of the equilibrium real exchange rate represents a bifurcation point; below this point the dynamics of the system is radically altered. For instance, given $\bar{\pi} = \bar{\pi}_1$, if the real exchange falls to values lower than $\bar{q}_m$ the system moves from stability to instability (see graph 3; note that the angular coefficient of the $\bar{\pi}$ + $g(\tilde{q})$ line is higher than that of the $i^*\tilde{q}$ line, which implies $(Ba - C\,u/v) > i^*$).

Graph 3: The Critical Real Exchange Rate for External Stability



The influence of the inflation target can be seen by taking the derivative of SC with respect to $\bar{\pi}$, which is negative:

(39) $$\frac{\delta[i^*\tilde{q} - \bar{\pi} - g(i_n(\bar{\pi}))]}{\delta\bar{\pi}} = -1 - (\frac{1+v}{v}) < 0$$

Graph 3 shows that a fall in $\bar{\pi}$ (from $\bar{\pi} = \bar{\pi}_1$ to $\bar{\pi} = \bar{\pi}_2, \bar{\pi}_1 < \bar{\pi}_2$) shifts the $\bar{\pi}$ + $g(\bar{q})$ line to the right (detached line)[13], making necessary a higher real exchange rate to achieve external equilibrium ($\tilde{q}_c^*$). Indeed there is a trade-off between $\bar{\pi}$ and $\bar{q}$ by which external stability can be obtained with a higher rate of inflation and a lower real exchange rate, or with a higher exchange rate and lower inflation rate. In effect, allowing both $\bar{\pi}$ and $\bar{q}$ to vary and taking the total differential of SC we have:

[13] It is important to observe that in graph 2 it has been assumed that the intercept of the $\bar{\pi}$ + $g(\tilde{q})$ line, which is *A* - *Bm* + *C*[(*1+v/v*)] $\bar{\pi}$, is a negative number. Such a result requires that $m > (g_o/h) + s\bar{\pi}$ (see equation 9). This will be more likely in the case of developing economies in which the import propensity is very high due to the characteristics of its economic structure, usually less diversified and concentrated in fewer goods.

$$(40) \quad \frac{d\tilde{q}}{d\bar{\pi}} = -\left.\frac{C(1+1/v)}{Ba - C\,u/v}\right|_{dSC=0}$$

Equation (40) makes explicit the trade-off between inflation target and real exchange rate compatible with a constant stability condition. It has interesting implications from the point of view of macroeconomic policy. In some countries governments have more capacity to influence the inflation target than the real exchange rate. The latter depends by large on structural variables related to international competitiveness or on the institutional conditions organizing wage bargaining in the labor market, which are less flexible. In an economy in which unions are very strong and set a low ceiling for the real exchange rate, or whose international competitiveness is weak, stability will require a higher inflation rate (within the limits discussed above). Inversely, if in an economy in which unions are concerned with international competitiveness (and hence with the employment rate), or unions are very weak and the government has more degrees of freedom to define the real exchange rate, then the economy will be able to achieve external stability with lower rates of inflation in equilibrium.

A more complicated puzzle emerges when both unions and the Central Bank are hard-headed and move forward independently with their own agendas. In this case the ensuing result could be a negative sum game leading to Ponzi finance in the external sector. Such a case may happen when unions constraint the real exchange rate to remain at a lower value than $\bar{q}_m$ while the Central Bank will insists on keeping inflation at very low levels. The combination of these two forces reduces capital accumulation, thereby increasing the relative external debt burden, which at the end of the day becomes unsustainable.

5. CONCLUDING REMARKS

In this paper we presented a simple Kaleckian-Mynskian model with a view to identifying the conditions leading to external instability in a small open developing economy. We made a heroic assumption, which is the validity at any moment of PPP and UIP: from this perspective the exercise is to some extent unrealistic. Still, this is a useful assumption in the case of small developing economy fully integrated to the world financial and goods markets. Some interesting results emerge from the model which are summarized as follows.

First, an inflation target policy would not be efficient under PPI and UIP. The reason is that the government cannot control inflation when the increase in the nominal interest rate leads to increases in the real exchange rate, which in turn feed inflation back. At the same time, the debt to capital ratio tends to move away from equilibrium.

Secondly, a real exchange rate target is efficient to avoid Ponzi finance, but the government cannot in this case define the rate of inflation. External stability is obtained when SC $= i^*q - g - \pi < 0$, i.e., when the country pays abroad in terms of real interest rates (the term $i^*q - \pi$) is less than the rate of economic growth (which reduces the debt to capital ratio). The paper discusses in which cases this will be true and highlights the risks of setting a too low target real exchange rate: if the country errs and sets the chosen q at a very low level, the economy becomes unstable.

Finally, it is discussed the case in which the economy is less globalized and PPP and UIP are (at least temporarily) suspended. In this case the government could choose (and effectively achieve) an inflation target compatible with external stability provided that q is higher than the critical real exchange rate.

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