EXTERNAL DEBT SUSTAINABILITY UNDER DIFFERENT POLICY RULES

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Abstract: The paper develops a Kaleckian macroeconomic model which discusses the conditions that may lead to an external debt crisis in a small developing economy fully integrated to global goods and financial markets. The focus is on how policy rules affect the stability of the economy. Two kinds of policy rules are discussed, namely an inflation rate target and a real exchange rate target, implemented through an interest rate operation procedure (IROP). It is argued that in both cases the evolution of the real exchange rate should be closely monitored to avoid external instability.

Key Words: Central Banks, Open Economy, External Crisis

JEL Classification: E12, E58, F43

INTRODUCTION

The objective of this paper is to discuss, from a Post-Keynesian (PK) perspective, how different monetary policy rules affect growth and stability in a small developing economy fully integrated to the international goods and financial markets. For a fully globalized economy we understand one in which the uncovered interest parity condition (UIP) and the dynamic (weak) version of purchasing power parity apply. We discuss the implications of two alternative monetary policies for the stability of the economy in this context. One alternative is to adopt a Taylor-rule with a view to achieving a certain desired level of inflation (an inflation target regime), while the real exchange rate endogenously adjusts. The other is that the government sets a real exchange rate target while the equilibrium inflation rate is endogenous.

The paper intends to contribute to the growing PK literature addressing the inter-relations between policy choices and stability when international flows of financial capital play a central role in the domestic macrodynamics, forcefully constraining the degrees of freedom of monetary policy[1]. Such a focus is chiefly motivated by the Latin American experience. In the last three decades Latin America has become much more integrated to international trade and financial markets[2]. This made it more complicated for the region to foster growth and stability at the same time, in spite of the alleged beneficial effects of financial openness[3]. In many countries, like Argentina, Chile and Uruguay, financial liberalization and the appreciation of domestic currencies in the 1970s was a critical force leading to the devastating 1982 debt crisis, which opened the Latin American “lost decade”. The same combination can be found in the nineties contributing to explain the crisis of Mexico (1994), Brazil (1999), Argentina and Uruguay (2002).

[1] PK open economy models have been recently revisited by Blecker (2010; see also Blecker, 1998 and 1999). Setterfield (2004 and 2006), Hein and Stockhammer (2007) and Lima and Setterfield (2010) have emphasized the impact of different policy rules on the stability of the economy. Meirelles and Lima (2006) and Lima and Meirelles (2007) focused on the stability of the debt to capital ratio. Such a concern with stability is also tributary to the classical Minskyan discussion of financial fraglity (Minsky, 1975; Taylor and O’Connel, 1985; Dymski and Pollin, 1994; Foley, 2003).

[2] See on this ECLAC (2001), Ocampo (2015, 2010), Stallings and Perez (2002) and Frenkel and Ros (2006). For a concise presentation of the centre-periphery approach that stresses the external constraint on growth in Latin America see Prebisch (1976).

[3] See Ffrench-David and Griffith-Jones (1997), Ffrench-Davis (2000) and Frenkel and Taylor (2006), Gala (2008) and Medeiros (2008).

In the mid-2000s the external constraint was considerable eased in some Latin American countries[4] due to the vigorous expansion of the world economy, along with improving terms of trade for several commodities. But the Latin American economic history and the 2008 world crisis suggest that external instability is by no means a matter of the past. In addition, several studies of PK persuasion have pointed out that widespread financial openness and capital mobility have tended to make the world economy more and lot less unstable (see Arestis, 2010; Dimsky, 2010). Therefore, the concern with growth, external constraints and the exchange rate would probably remain in the macroeconomic research agenda of Latin America for a long time to go.

The paper is organized in two sections besides this introduction and the concluding remarks. Section 1 presents the basic model giving particular attention to the dynamics of the external debt. Section 2 discusses the conditions for equilibrium in the external debt under two different monetary rules, namely inflation target and real exchange rate target. It is argued that in both cases the Central Bank should closely monitor the evolution of the real exchange rate in order to avoid the emergence of an explosive situation in the external front.

1. Macroeconomic Dynamics

1.1 The goods market

We assume an open economy in which the role of the government is confined to define either an inflation target or a real exchange rate target, and then set the nominal interest rate compatible with this objective. Although the model admits the possibility of using fiscal policy (see below) we will not explore this avenue. We focus instead on an interest rate operation procedure (IROP) as the key instrument of macroeconomic policy (Setterfield, 2006). This is consistent with the

[4] 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, experienced a positive shock. On the other hand, the small Central American countries, whose comparative advantage depends largely on cheap labor, suffered from declining terms of trade and increasing Chinese competition in the US market (ECLAC, 2008).

main point addressed in the paper -- the effects of monetary policy in the stability of a small open developing economy.

Taking as a point of departure the basic macroeconomic identities (1) and (2) below, and assuming that workers do not save, we obtain:

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

(2) $Y = W + P$

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

Y is GDP, C is aggregate consumption, I is total investment, NX are net exports, P are profits, W are wages and s ($0 < s < 1$) is the exogenous savings rate. All variables are defined in real terms.

The rate of growth of the capital stock (investment per unit of capital, $g \equiv I/K$) 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" (and which may also account for autonomous public expenditure).

(4) $g = g_0 + h(r^e - i_r)$, $0 < h < s$

Based on the Fisher equation, the real interest rate can be approximated by the difference between nominal interest rate (i_n) and the inflation rate (π):

(5) $i_r \cong i_n - \pi$

Real net exports per unit of capital ($b \equiv NX/K$) are a function of the real exchange rate, defined as $q = ep^*/p$ (where p is the domestic price level, p^* foreign prices and e the nominal exchange rate), and the propensity to import (m), according with the following equation:

(6) $b = -m + aq$, $m > 0$, $a > 0$

Combining equations (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 real 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 written as an IS curve (equation 9) :

(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 $C \equiv \frac{hs}{s-h}$.

Consistent with the PK approach adopted in the paper, equation (9) does not contain any reference to potential output, Okun Law or the natural rate of unemployment (Lavoie, 2009). Moreover, the real exchange rate affects the growth rate of exports, not just its level[5].

Equilibrium in the goods market may not be sustainable depending on the dynamics of the external sector. Our subject is an economy that has little room for maneuver in a system highly integrated in terms of trade and financing, which must be concerned with its foreign debt. This is the point addressed in the next section.

[5] This rate effect is due to the specification of net exports in equation (6), as suggested by Basu (1997) and Blecker (2010).

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 markets at the nominal international interest rate i^* plus a risk premium R. There is an infinite capital supply at the interest rate ($i^* + R$). In the rest of the paper we will assume $R = 0$, which strongly simplifies the analysis and does not compromise the main objective of the paper - to discuss the relation that exists between policy rules, growth and stability. Domestic firms and consumers have no constraints on access to financial lending at the domestic interest rate.

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:

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

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 $\frac{d(Dp)}{pdt} = \dot{D} + D\pi$, where dots on the variable indicates derivatives with respect to time (vg . $d(D)/dt \equiv \dot{D}$). Therefore the evolution of the real external debt D (expressed in units of the borrowing country product) may be written as follows:

(11) $$\dot{D} = -(aq - m)K + D(i^* q - \pi)$$

The real debt to capital stock ratio is $\delta = D/K$. The rate of growth of δ ($\hat{\delta} \equiv (d\delta / dt)/\delta$) is given by:

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

By dividing equation (11) by *D*, and using (12), we obtain the equation of motion of the real external debt to capital ratio (in terms of the Home country product):

(13) $\dot{\delta} = m - aq + \delta(i^* q - \pi - g)$

Recalling that *g* is a function of the real interest rate and *q*, then the evolution of δ depends too on these two variables.

1.3 UIP and PPP

In a world economy featuring highly liquid financial markets the uncovered interest parity (UIP) condition should hold in equilibrium. According to this condition the difference between the domestic and international nominal interest rates equals the expected rate of devaluation (i.e. the expected rise in the nominal exchange rate, $\hat{e}^e$):

(14) $i_n = i^* + \hat{e}^e$

With backward-looking expectations, the expected rate of devaluation falls when the effective rate of devaluation rises. Assuming $\hat{e}^e = (-1/j)\hat{e}$ and using (14), then we can fin the effective rate of devaluation as a function of the difference between the foreign and domestic interest rates:

(15) $\hat{e} = j(i^* - i_n), j > 0$

We assume that the weak (or dynamic) version of the principle of purchasing power parity (PPP) holds ($\hat{q} = 0$). This requires that nominal exchange devaluations compensate for the difference between the domestic and international inflation rates ($\pi - \pi^*$). By log-differentiating the real exchange rate $q = p^*e/p$ we have:

(16) $\hat{q} = \pi^* + \hat{e} - \pi = 0$

Last but not least, we need an equation for the inflation rate. We will assume that it responds to two variables related to a key dimension in PK models, namely the role of the distributive conflict in inflation. From one hand, inflation is related to the real interest rate i_r. A lower i_r favors the expansion of investment, consumption and employment, and this boosts wage demands[6]. On the other hand, inflation also depends on the real exchange rate. 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"). In addition, 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 (Blecker 1999; Damill and Frenkel, 2009).

Thus, the inflation rate will be a function of the real interest rate and the real exchange rate, $\pi = \tilde{u}q - \tilde{v}\left(i_n - \pi\right)$ or:

(17) $\pi = uq - vi_n$, $v \equiv \tilde{v}/\left(1-\tilde{v}\right) > 0$ and $u \equiv \tilde{u}/\left(1-\tilde{v}\right) > 0$.

Using equations (14), (15) and (17) in (16) we get:

(18) $\hat{q} = \pi^* - j(i_n - i^*) - uq + vi_n = 0$

The equilibrium real exchange rate will be given by:

(19) $q = \dfrac{z - \left(j - v\right)i_n}{u}$

where $z \equiv \pi^* + ji^*$ and $j > v$. Using (19) in (17) we get:

(20) $\pi = z - ji_n$

[6] The assumption is that a rise in the real interest rate is efficient in reducing output and labor demands, thereby curbing inflation. This assumption does not always hold, as Lima and Setterfield (2009) have argued.

The rate of economic growth (from equations 9 and 19) can be written as:

(21) $g = \tilde{g} - \beta i_n$, where

$\tilde{g} \equiv A - Bm + z[(Ba + Cu)/u]$ and $\beta \equiv (j - v)Bau^{-1} + C(1 + j)$.

So far we have a differential equation for the evolution of the debt to capital ratio (equation 13) and functions for the inflation rate (equation 20) and the real exchange rate (equation 19), along with a set of given parameters (a, s, h, m, g_0, π^*, i^*, u, v, j, A, B and C). But there is still one more endogenous variable whose behavior remains unspecified, namely the domestic nominal interest rate. We assume that the government defines the IROP procedure in accordance with two alternative policies: inflation target and real exchange rate target. The implications of these alternatives are the topic of the next sections.

2. Inflation Target and Real Exchange Target: Implications for Growth and Stability

2.1. Price and external stability under inflation target

We will firstly assume that the government adopts a strict inflation target ($\bar{\pi}$) policy: the Central Bank takes decisions as regards the nominal interest rate according with a simple Taylor rule[7]. This assumption reflects the fact that inflation target combined with a fluctuating exchange rate regime has been increasingly adopted in many Latin American countries since the nineties.

(22) $\dfrac{di_n}{dt} = \alpha(\pi - \bar{\pi})$, $\alpha > 0$

Equations (13) and (22) form a 2x2 system of differential equations. Using (19), (20) and (21) in (13), and (20) in (22), we can rewrite the system as follows:

[7] Clearly, other more complex monetary rules can be devised, but we have worked with the simplest one in order to focus on the interplay between price stability and external sustainability.

(23) $\dot{\delta} = m - aq(i_n) + \delta\left(i^* q(i_n) - \pi(i_n) - g(i_n)\right)$

(24) $\frac{di_n}{dt} = \alpha(z - ji_n - \overline{\pi})$

The Jacobian is given by:

(25) $J = \begin{bmatrix} i^* q - \pi - g & aq_i + \delta\left(i^* q_i - \pi_i - g_i\right) \\ 0 & -\alpha j \end{bmatrix}$

The subscripts *i* in the variables denote partial derivatives with respect to the nominal interest rate (i_n). Since α and *j* are positive, a sufficient condition for having a stable equilibrium is that:

(26) SC = $i^* q - \pi - g < 0$

The previous expression (computed at the equilibrium values) defines the stability condition (SC). A negative SC produces stability, while a positive SC implies a negative determinant and hence a saddle point equilibrium. In the latter case, except from the very special case in which the initial values of *i* and δ are precisely on the stable path, neither inflation target nor a constant debt to capital ratio would be attained.

In equilibrium the inflation rate is equal to the inflation target and therefore $z - ji_n = \overline{\pi}$. From this we can find the nominal interest rate in equilibrium and (using equation 19) the real exchange rate in equilibrium:

(28) $i_n^E = \frac{z - \overline{\pi}}{j}$

(29) $q^E = \frac{z}{u} - \left(\frac{j - v}{uj}\right)\left(z - \overline{\pi}\right)$

An interesting question is how the target set for the inflation rate affects the stability of the economy. Taking the derivative of the SC with respect to the inflation target renders:

$$(30)\ \frac{\partial SC}{\partial \bar{\pi}} = \frac{j-v}{uj}(i^* - Ba) - 1 - C\left(\frac{1}{j} + 1\right)$$

This expression is mot likely to be negative. Therefore, a higher inflation target tends to reduce *SC* and increase the stability of the system. Conversely, if a conservative Central Bank independently pursues a too low rate of inflation, this may give rise to a sharp appreciation of the real exchange rate and to an explosive situation in the external front.

In other words, in the specific conditions defined by a close integration to world markets, the Central Bank must keep an aye on the real exchange rate when it defines its inflation target. Otherwise the result would be growing instability and an ensuing debt crisis.

2.2. A special case: perfect foresight with inflation target

An interesting alternative scenario is when perfect foresight is assumed. This corresponds to the case in which j = -1 in equation (15), which implies that the expected rate of devaluation equals precisely the effective rate of devaluation. In this case, the foreign and domestic real interest rates are equal, and then it will be true that $i^* = i - \pi^* + \pi$. This requires that the real exchange rate instantly "jumps" to its new equilibrium value $q = (1/u)[(1+v)i_n - (i^* - \pi^*)]$ in response to any difference in the real interest rates, thereby rendering a new system of differential equations:

$$(31)\ \dot{\delta} = m - aq(i_n) + \delta(i^* q(i_n) - u(i_n) + vi_n - g(i_n))$$

$$(32)\ \frac{di_n}{dt} = \alpha[i_n - (i^* - \pi^*) - \bar{\pi}]$$

The equilibrium values in the new system are the following:

$$(33)\ i_n^E = i^* - \pi^* + \bar{\pi}$$

(34) $$\delta^E = \frac{aq^E - m}{(i^* - q^E) - \bar{\pi} - g(q^E)}$$

(35) $$g^E = A + B(q^E - m) - C(i^* - \pi^*)$$

(36) $$q^E = \frac{v(i^* - \pi^*) + (1+v)\bar{\pi}}{u}$$

To analyze the stability of the system we compute the Jacobian at the equilibrium values:

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

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, 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 unstable. Therefore in both cases the system will not reach a stable equilibrium. The international economy is populated by two types of countries: some of them are in a virtuous path of growth with an increasingly lower debt to capital ratio, while others move towards explosive deficits in the external front. In none of the two cases the inflation target would be attained at the end of the day. Paradoxically, full integration to the financial markets plus rational expectations, which are usually considered as conditions for stability, makes the attainment of the inflation target an impossible task. This occurs because the IROP is ineffective as an instrument for channeling the economy towards its equilibrium path.

Although the previous case represents an extreme situation that it is unlikely to be found as such in the real world, it helps to understand the problems of small open economies (particularly in Latin America) that have been particularly vulnerable to large swings in international lending. As has been recently stressed by Ocampo et al (2009, p. 105):

"*counter-cyclical interest rates policy goes against the logic of pro-cyclical swings in parity interest rates. By trying to increase domestic interest rates during booms, when parity rates tend to fall, the central bank would generate a great inducement to additional capital inflows, which would reinforce the tendency of the exchange rate to appreciate*".

A similar conclusion has been reached in a recent study by ECLAC (2010):

"*In the region's experience, the real exchange rate —a fundamental macroeconomic prices when it comes to making decisions relating to production and spending on tradable goods— behaves in an extremely procyclical manner. Its evolution has been strongly correlated with capital flows, which (…) are subject to cyclical variations.*" There is a "*marked correlation between the real exchange rate and net capital flows for Latin America in average terms in the years dominated by the Washington Consensus. The procyclical behaviour of these flows is transmitted to the real exchange rate insofar as a boom has often caused sharp currency appreciations, which have repeatedly led to current account disequilibria through over- or undershooting in times of crisis*"

As in the previous case, the management of the real exchange rate is critical to secure stability. In the next section we will argue that a real exchange rate target may represent a policy rule more conducive to promote stability than pure inflation target.

2.3. Real Exchange Rate Target

We now assume a different institutional setting, in which the government pursues a real exchange rate target. A plausible rationale for this is that it follows an export-led growth strategy and therefore aims at avoiding any loss of international competitiveness derived from a fall in the real exchange rate. Such a strategy is very much in line with the insights provided by growth models based on the Kaldorian tradition and on the Balance-of-Payments constraint (McCombie and Thirlwall, 1994; León-Ledesma, 2002). Germany, South Korea and Brazil in the sixties and early seventies, and more recently China and Argentina[8], are examples of countries which in different periods embraced policies that sough to keep the exchange rate competitive.

As in the previous case, the instrument to influence the exchange rate is an IROP: the government defines the nominal interest rate so as to make it compatible with the desired real exchange rate. In addition, the government acknowledges that in a globalized economy the domestic and the international real interest rates should be equal, i.e. $i^* - \pi^* = i - \pi$. From (18) we know that $\pi = u\bar{q} - v i_n$, where $\bar{q}$ is the real exchange rate target. This allows us to find the nominal interest rate target ($\bar{i}_n$) that will produce the real exchange rate target ($\bar{q}$) along with the equality of the foreign and domestic interest rates. Formally:

$$(38) \quad \bar{i}_n = \frac{u\bar{q} + i^* - \pi^*}{1+v}$$

Note that in the previous section we used equations (18) and (19) to find the real exchange rate compatible with PPP and UIP. In this section we use the equality of the real interest rates to find the nominal interest rate compatible with the target for the real exchange rate[9].

Equation (38) shows that if the real exchange rate is higher than the target ($q > \bar{q}$), so is the nominal interest rate ($i_n > \bar{i}_n$). Therefore the reaction function of the government – which is by assumption committed to achieve the target real exchange rate using an IROP -- can be represented as follows (with $\xi > 0$):

$$(39) \quad \frac{di_n}{dt} = \xi\left[\bar{i}_n - i_n\right]$$

And using equation (38) in (39):

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[8] Damill and Frenkel (2009) observed that the same type of policy, with significant effects on the rates of growth and external equilibrium, was adopted in Argentina since 2003 (although they point out that such a policy lost consistency after 2007).

[9] In terms of equation (15), perfect foresight implies $j = -1$ and $q = \bar{q}$.

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

We now have a new system of differential equations with δ and i_n as endogenous variables. One is equation (40), and the other is equation (41) below, which is a slightly modified equation for the dynamics of the debt to capital ratio (see also equation 13):

(41) $$\dot{\delta} = m - a\bar{q} + \delta[i^*\bar{q} - \pi(i_n) - g(i_n)]$$

In equilibrium it will be true that:

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

(43) $$\delta^E = \frac{a\bar{q} - m}{i^*\bar{q} - \pi^E - g^E}$$

It is now easy to find the equilibrium growth and inflation rates:

(44) $$g^E = A + B(a\bar{q} - m) - C(i^* - \pi^*)$$

(45) $$\pi^E = \frac{u\bar{q} - v(i^* - \pi^*)}{1+v}$$

The Jacobian of the system formed by equations (4) and (41) is as follows:

(46) $$J = \begin{bmatrix} i^*\bar{q} - \pi^E - g^E & \delta[-v - C(1+v)] \\ 0 & -\zeta \end{bmatrix}$$

The stability condition (*SC*) defined by equation (26) can be rewritten as:

(47) $$SC = i^*\bar{q} - \pi^E(\bar{q}) - g^E(\bar{q}) < 0$$

The influence of an increase in the real exchange rate target on the stability of the system can be studied by taking the derivative of *SC* with respect to $\overline{q}$ in equilibrium. If the derivative is negative, a real depreciation of the currency favors stability. In effect:

$$(48) \quad \frac{\partial\left[i^*\overline{q} - \pi^E(\overline{q}) - g^E(\overline{q})\right]}{\partial\overline{q}} = i^* - \frac{u}{1+v} - Ba$$

The rise in $\overline{q}$ has two effects. One is to increase the burden of the debt in real terms: the country pays more interest on the external debt in terms of the domestic good. for the same interests. The second effect is to foster competitiveness, leading to faster growth and hence to a lower debt to GDP ratio. If $i^* - u/(1+v) < Ba$, the second effect prevails and a higher real exchange rate makes the system more stable. We will assume that this condition holds. As a result, $\overline{q}$ should be higher than a critical value for the system to be stable. To find this critical value $\overline{q}_c$, we use equations (42) –(45) in the stability condition (47):

$$(49) \quad i^*\overline{q} < \frac{u\overline{q} - v(i^* - \pi^*)}{1+v} + A + B(a\overline{q} - m) - C(i^* - \pi^*)$$

And therefore:

$$(50) \quad \overline{q}_c > \frac{[Bm + C(i^* - \pi^*) - A](1+v) + v(i^* - \pi^*)}{(Ba - i^*)(1+v) + u}$$

If the government sets the real exchange rate target bellow this critical value the system becomes unstable. As in the case of inflation target, in a small open economy fully integrated to the international financial markets, the real exchange rate policy critically matters: a mistake in managing this variable may give rise to a cumulative process of indebtedness and instability, depicted by the instability region in Figure 1. In this Figure the declivity with respect to $\overline{q}$ of the second term of the SC ($u(1+v)^{-1}+Ba$) is higher than *i** and $A-Bm-(i^*-\pi^*)[C+v/(1+v)]<0$. These conditions allows for a positive value of $\overline{q}_C$.

[Figure 1 about here]

Equation (50) also points out that an international shock raising the real foreign interest rate (due, for instance, to more turbulent times in the financial markets) will increase $\overline{q}_c$ (from $\overline{q}_c^1$ to $\overline{q}_c^2$). If this shock is strong enough to make $\overline{q}_c > \overline{q}$, then a real depreciation is required to avoid instability, shifting the (see Figure 1). Inversely, industrial and technological policies aimed at enhancing non-price competitiveness (reducing *m*) give rise to a lower critical value of the real exchange rate. Thus, there are two complementary forms of restoring growth and stability in the context of a deterioration of the international conditions, namely increasing $\overline{q}$ or reducing *m*[10].

If the government solely responds to the shock with a real depreciation, then conflict will be heightened in the labor market, to the extent that the real exchange rate and real wages are inversely related (Blecker, 1999). Unions will see this policy as an attempt to adjust the economy by exclusively penalizing workers. In addition, a higher real exchange target also implies having to accept higher levels of inflation. On the other hand, if the government responds by strengthening the industrial and technology policies, a fall in *m* will soften the impact of the crisis on the labor market and the inflation rate.

This result supports the idea, suggested by several authors, that industrial and technological policies are even more necessary in times of crisis than when the international markets work smoothly[11]. Small open economies should have strong policies in favor of learning and structural change since they are much more vulnerable to changes in the international conditions[12]. The successful experiences of technological and industrial catching-up of the East Asia newly

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[10] For simplicity we focus on the effect of the industrial policy in *m*, but it should be noted that the effect on competitiveness may also occur through an increase in the parameter *a*.

[11] See Cimoli and Porcile (2009).

[12] An interesting work offering historical evidence on this point for the small European economies is Katzenstein (1985). Razmi and Blecker (2008) suggest that changing the pattern of specialization may help to avoid the "fallacy of composition" – the impossibility that most countries could pursue at the same time an export-led growth strategy.

industrialized countries are a well-known example of how growth and external stability have gone hand in hand with active industrial policies in open developing economies. These countries combined a competitive real exchange rate along with more equal patterns of income distribution than Latin America, where slow growth and macro instability have been rather frequent[13].

CONCLUDING REMARKS

In this paper we presented dynamic model with a view to identifying the conditions that may lead to instability in a small open developing economy under different monetary rules. In recent years many developing economies have become more integrated to the international markets – particularly financial markets. They have also adopted policy rules based on inflation target and a fluctuating exchange rate regime (especially in Latin America). Alternatively, other developing economies (particularly China) have chosen to keep the real exchange rate at a (high) competitive level. In this paper we discuss the implications of these policy options for external debt stability.

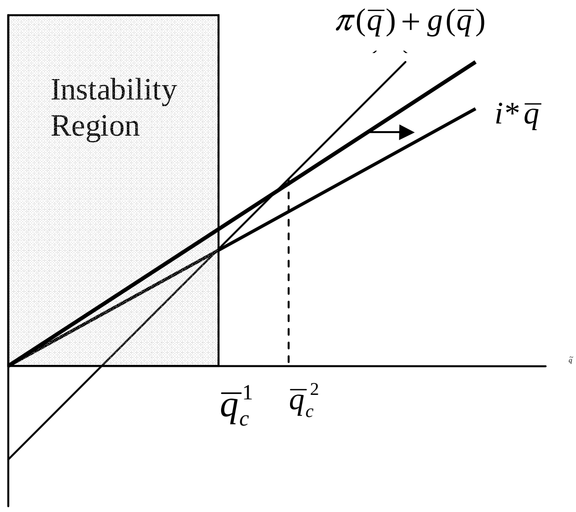
We show that an inflation target regime may give rise to stability but there are serious risks in focusing exclusively on inflation. If the central bank uses its relative autonomy to pursue an ambitiously too low inflation target, with no regard to the effects it produces on the real exchange rate, the loss of competitiveness may bring about an external crisis. Moreover, in a scenario featuring rational expectations and the equality of the domestic and foreign real interest rates, inflation target leads to instability. A second institutional scenario is defined by a policy rule that sets the interest rate in accordance with a real exchange rate target. If the government sets the real exchange rate at a level higher than a critical value, then the economy will achieve stability, even in the extreme case in which the real interest rates (foreign and domestic) are equal in the short run.

In both cases, a close monitoring by the government of the evolution of the real exchange rate is necessary for avoiding a downward move below the critical level that compromises external

[13] Prebisch (1981) offers a thought-provoking analysis of the role of active policies in reducing the negative impact of external crisis on growth and class conflict in the Latin American economies. The Latin American literature on the 1982 debt crisis and the ensuing inflationary process highlighted how real devaluations heightened the intensity of the distributive conflict. See also Porcile and Lima (2010).

stability. Moreover, policies in the technological front -- aimed at enhancing non price competitiveness -- can be a useful instrument to reduce the impact of the distributive conflict on the inflation rate and the real exchange rate. In this sense concerns with short term stability should not neglect the need of long term policies for international competitiveness. On the contrary, the latter can be seen as a condition for the success of the former.

Figure 1 – The Critical Real Exchange Rate and External Stability: The Effect of a rise in *i**



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