Thirlwall's Law, External Debt Sustainability and the Balance of Payments Constrained Level and Growth Rates of Output*

Gustavo Bhering

Franklin Serrano

Fabio Freitas

Abstract

Thirlwall's law, given by the ratio of the rate of growth of exports to the income elasticity of imports is a key result of Balance of Payments (BOP) constrained long run growth models with balanced trade. Some authors have extended the analysis to incorporate long run net capital flows. We provide a critical evaluation on these efforts and propose an alternative approach to deal with long run external debt sustainability, based on two key features. First, we treat the external debt to exports ratio as the relevant indicator for the analysis of external debt sustainability. Second, we include an external credit constraint in the form of a maximum acceptable level of this ratio. The main results that emerge are that sustainable long run capital flows can positively affect the long run level of output, but not the rate of growth compatible with the BOP constraint, as exports must ultimately tend to grow at the same rate as imports. Therefore, Thirlwall's law still holds.

JEL codes: *F43, F32, O41*

I. Introduction

Thirlwall's law, that states that the long run rate of growth of output consistent with the Balance of Payments Constraint (BOP) is given by the ratio of the rate of growth of exports to the income elasticity of imports (Thirlwall, 1979), is regarded to this day as a benchmark in heterodox growth models. Thirlwall developed this rule in the context of a model with no persistent capital flows very similar to what Kaldor had previously worked with (Kaldor, 1978[1970] and 1978[1971]). Since the appearance of this rule, some authors, including Thirlwall himself, aimed at inquiring about the impact of long run net capital flows on BOP constrained rate of growth.

From a general point of view, we can identify two strands within this literature: i) models that include net capital flows as an exogenous variable; ii) models that include

* Draft for discussion purposes, april 17 2019. The authors are from de Grupo de Pesquisa em Economia Politica, Instituto de Economia , Federal University of Rio de Janeiro (UFRJ), Brazil.

capital flows with a debt sustainability condition depicted by the stability of the proportion between the current account deficit (or external debt) and GDP.

In this paper, we provide a critical evaluation of these models, with special attention to the last type of models that deal with debt sustainability. The first type of model has the problem of including capital flows as exogenous and, thus, not discussing the conditions and possible limits to the long run sustainability of these external capital flows. The second type of models is explicitly concerned with external debt sustainability but have some serious theoretical shortcomings. As we will show, by focusing on the ratio of the current account external debt to gross domestic product, these models implicitly consider domestic output as the measure of the capacity to pay for external liabilities. This is very unrealistic, as it leaves aside the crucial currency mismatch between the currency issued by a country and the currency in which its external liabilities are denominated and must be paid, which is a key feature of the very idea of a balance of payment constraint. Moreover, this leads to an implausible sustainability condition and also makes these models unable to determine the long run *level* of aggregate output compatible with the BOP constraint.

In order to overcome these limitations, we propose an alternative framework to analyze long run external debt sustainability. Our approach has two key features. First, we treat the debt to exports ratio as the relevant sustainability indicator because exports (and not GDP) are the source of cash flow in international currency used to pay external liabilities. Second, we include an external credit constraint in the form of a maximum acceptable level of this indicator. The main results that emerge are that sustainable (unsustainable) long run capital flows can positively (negatively) affect the long run level of output, but not the rate of growth compatible with the BOP constraint, as exports must ultimately tend to grow at the same rate as imports. Therefore, Thirlwall's law still holds.

We proceed as follows. In section II we present a simplified version of the basic balanced trade model that uses Harrod's foreign trade multiplier for the level of output and Thirlwall's law for the determination of long run BOP constrained rate of growth. In section III we present our alternative framework to analyze long run net capital flows and external debt, which will be compared and contrasted with the literature in the following two sections. In section IV we discuss the exogenous long run net capital flows models. In section V we deal with the models that discuss debt sustainability using the current account to GDP ratio. In section VI we present some brief final remarks.

II. Harrod's Foreign Trade Multiplier and Thirlwall's Law: The Kaldor-Thirlwall Approach

Before we discuss how capital flows are treated in Kaldor-Thirlwall models of BOP constrained growth, it is important to briefly describe the models that do not consider capital flows in order to allow us to compare them. These simplified models are depicted in Kaldor (1978[1970]) and Thirlwall (1979). The main idea behind these models is that, in the long run, as imports are driven by the level of activity. In this sense, both the country's GDP and its rate of growth are constrained by the availability of foreign exchange which is determined solely by aggregate exports. Thus, if we combine the condition that exports must be equal to imports, $X = M$, and define imports as a function of output given by $M = mY$[1], we are able to determine the level of output compatible with the external constraint through Harrod's foreign trade multiplier:

$$Y_{BP} = \frac{X}{m} \tag{1}$$

where X is total exports, M is total imports, m is the marginal propensity to import, Y_{BP} is the level of output that meet the external constraint and $1/m$ is Harrod's foreign trade multiplier. Here, we consider that relative prices are given in the long run, as well as the nominal exchange rates so that the real exchange rates are also given. All variables are measured in "dollars" and there is no inflation.

The "dynamic" version of Harrod's foreign trade multiplier became known as Thirlwall's law, which extends the result of equation (1) to the rate of growth of output constrained by the external account. The rate of growth of Y_{BP} can be written as:

$$g_{BP} = \frac{g_X}{\pi} \tag{2}$$

where g_{BP} is the rate of growth of Y_{BP}, g_X is the rate of growth of exports and π is the income elasticity of imports. Here, an income elasticity of imports greater (lower) than one means that the marginal propensity to import is increasing (decreasing) as the economy grows. Thirlwall's law became the benchmark rule for the balance of payments constrained models, both at a theoretical and empirical level (Thirlwall, 2011; Setterfield,

[1] Usually, imports are treated through a multiplicative non-linear function of output and real exchange rate. Here, for the sake of simplicity, we already assume that the real exchange rate is given and we opt for this linear specification of imports as induced by the level of output throughout the whole paper.

2011; Blecker, 2016).

These models have two important limitations. The first that will not be discussed in this paper is that within the Kaldor-Thirlwall literature, both the level of long run output and rate of growth compatible with the BOP constraint are treated as the *direct determinants* of the actual or effective values of these variables. Here we treat the long run levels and rates of growth of output determined by these models only as proper external *constraints* and as such these constraints may or may not be binding in the long run.[2] In this simplified model of balanced trade, two hypotheses are made for an always binding BOP constraint (Kaldor, 1978[1970]; Thirlwall, 1982). The first is that the overall domestic marginal propensity to spend is equal to one and the second is that there are no autonomous components in aggregate demand other than exports.

The second limitation is that, of course, the idea that trade will always tend to balance and that there are no capital flows in the long run is very unrealistic. Later, as we shall see in sections IV and V Kaldor-Thirlwall literature moved forward incorporating long run capital flows, discussing how long run net capital flows would modify the BOP constrained rate of growth of output as given by Thirlwall's law in the case of balanced trade.

III. A Framework to Analyze Capital Flows and External Debt

In order to simplify our exposition, we consider here long run net capital flows on the BOP account as consisting only of the flow of new external debt to finance the current account deficit. Since Thirlwall's original model did not allow for long run capital flows, the constraint was set as the need to pay for import with export revenues. Here, since long run capital flows are possible, the constraint is that a country cannot lose international reserves indefinitely. We can write the equation for the BOP as:

$$BOP = X - M - R + F \tag{3}$$

where R is the net income sent abroad and F is the net financial inflows in the capital account. Here, we assume that the net income sent abroad corresponds exclusively to the payment of external debt services in the form of interest. The result of BOP measures the variation of international reserves in a given period. As a long run condition, let us assume

[2] For discussion on the problems of considering the BOP constraint as always binding, see Freitas (2003).

that a country cannot lose its reserves indefinitely. That is, in the long run, it is not possible to lose reserves continuously, but there is no insurmountable problem in accumulating them. Thus, the result of the BOP must be such that $BOP \geq 0$. For the boundary condition, $BOP = 0$, we have:

$$F = M - X + R \tag{4}$$

That is, net capital flows must be enough to pay for the current account deficit. These flows of new external debt can be rewritten as the variation of the stock of external debt since new debt always corresponds to the need to finance the current account deficit. Thus, in our simplified analysis, changes in net external liabilities are due to the current account deficit (deficit in the trade balance plus factor service payment). In formal terms, we can write:

$$D - D_{-1} = M - X + R \tag{5}$$

where D is the stock of external debt (or net external liability) in period t. The variables without subscript refer to period t and subscript -1 corresponds to t-1. We assume that the net financial inflows F is equal to the change in the stock of external debt D-D_{-1}, which allows us to establish a relationship between the current account deficit and the change in the stock of external debt by passing from equation (4) to equation (5).. Also, we must add one more equation to the system in order to consider interest payments as a function on the past stock of external debt:

$$R = rD_{-1} \tag{6}$$

That is, we will consider that the net income sent abroad is the payment of an average net cost of the liability, r, and on the value of the accumulated stock of external debt. Within this context, it is necessary to evaluate the impact of capital flows on output and growth with regard to both the conditions of debt sustainability and possible limits on the size of the external debt.

Since the external constraint basically means a scarcity of foreign currency which is not issued by the country, there is a *currency mismatch* (unless we are dealing with the USA in the current floating dollar standard). Due to the currency mismatch, the ability to

repay the external debt should reflect the ability to obtain foreign currency. Thus, the macroeconomic variable that represents the ultimate direct inflow of foreign exchange earnings are *exports* (Medeiros & Serrano, 2001). Therefore, we think that the adequate indicator for measuring the capacity to repay external debt is the ratio of external debt to exports. It follows that a satisfactory analysis of the impact of capital flows on long run output should be based on the sustainability and possible limits of the size of the external debt-exports ratio. Starting from equations (5) and (6), we are able to determine the level of the debt-to-exports ratio in period *t*:

$$d = \frac{M}{X} - 1 + \frac{1+r}{1+g_X} d_{-1} \tag{7}$$

where d is the debt-to-exports ratio and g_X is the growth rate of exports.

Let us look at the sustainability conditions that would prevent the debt to exports ratio from growing indefinitely. From the difference equation in (7), we have two conditions for d not to explode in the long run. First, if there is a given external account primary deficit (relative to exports) of any size, the cost of external debt given by the interest rate on external debt r has to be lower than the rate of growth of exports. If the rate of interest is greater than the rate of growth of exports, a country will not be able to generate foreign currency revenue enough to pay for the increase in external debt stemming from interest payments alone, which leads to the explosion of the ratio of external debt relative to exports in the long run. Hence the first condition for external debt sustainability is that $r < g_X$.

Second, even if the condition that $r < g_X$ is met, the ratio between imports and exports cannot grow in the long run, or else a trade deficit would always grow faster than exports, creating debt at a higher pace than exports revenue. In other words, in the long run, *imports should not grow faster than exports*.[3] This is precisely the same long run constraint imposed by Thirlwall's law in the simplified model with zero net capital flows. As we can see, even if we include capital flows and external debt, the fact that external debt cannot grow indefinitely as a proportion of exports leads to the same constraint on the relation between the rate of growth, but not the levels, of imports and exports.

However, although necessary, these two conditions are not sufficient to describe the limits to external debt and the country's creditworthiness. If we imposed only that

[3] Lourenço (2011) draws attention to the condition that is generally implicit in analyzes of the sustainability of external debt that the growth rate of imports should not be higher than that of exports.

external debt cannot grow relative to exports continuously in the long run, we could arrive at the unrealistic conclusion that a country with a low level of indebtedness measured by the ratio d is as much constrained by the BOP as a country with a very high level of indebtness, provided that they both maintain a somewhat stable, or at least not explosive, path for d.

It is more realistic to assume that credit constraints will appear if the level of indebtedness given by the ratio d is sufficiently high. The assumption that we shall make here is that there is a foreign credit constraint, a given limit to the level of this indicator, above which international financial institutions interrupt the financing of the current account deficit. As this indicator measures a country's ability to pay, beyond a definite given level that we shall call d_{Max}, banks will no longer finance external deficits. Inserting this in (7), we can find the maximum ratio of imports to exports for which the level of indebtedness is at its limit level determined by credit constraint conditions:[4]

$$\frac{M}{X} = 1 + d_{Max}\left(\frac{g_X - r}{1 + g_X}\right) \tag{8}$$

where d_{Max} is the maximum value of d and is an exogenous parameter, given by the limits to external debt financing set by international financial institutions. Thus, when we have the possibility of external debt ($d_{Max} > 0$) there is no need for balanced trade. Balanced trade would imply $M/X = 1$. It follows that from equation (8), for $r \neq g_X$ and $d_{Max} \neq 0$, we have $M/X \neq 1$. To simplify, let us consider:

$$d_{Max}\left(\frac{g_X - r}{1 + g_X}\right) = b \tag{9}$$

Assuming, as in section II, that imports are induced by the level of output, $M = mY$, we get:

$$Y_{BP} = \frac{X(1 + b)}{m} \tag{10}$$

In this model, b represents the debt financing conditions and their limits, namely the ceiling imposed by international creditors and the relationship between the cost of liabilities and the rate of growth of exports. In fact, the model of section II would be a particular case of this model, in which $b = 0$, that is, $d_{Max} = 0$, since it would not be

[4] Here we simply calculate the level of d when it is stable at its maximum level. We make $d = d_{-1} = d_{Max}$.

possible to maintain permanent capital flows and, thus, no long run external debt.

Furthermore, the long run output allowed by the balance of payments constraint with capital flows may be larger or smaller than the balanced trade output depending on the sign of b. More specifically, the sign of b will be determined by the relationship between the average cost of liabilities and the rate of growth of exports. When $r < g_X$, we have that $b > 0$ and when $r > g_X$ we have that $b < 0$.. For a permanent positive growth rate of d, the debt at some point will achieve its upper bound. Hence, for $b < 0$, the presence of external debt further constrains output relative to the simplified model of section II. This means that if a country has a stock of net external liabilities, a change in the average cost of liabilities that makes it larger than the rate of growth of exports renders foreign debt unsustainable and further constrains output, as the country has to generate current account surplus to meet the limits to its foreign debt and will do so by limiting imports through lower output. Alternatively, for a lower cost of liabilities relative to the rate of growth of exports, the possibility of external debt has a positive impact on the levels of long run BOP constrained output.

The main conclusion we draw from this framework relative to the model of balanced trade in the previous section II above is that capital flows will have an impact on the long run level of output that balances the BOP. But for the BOP constrained rate of growth of output, since imports cannot grow permanently higher pace than exports without making the current account and external debt relative to exports grow without limit, the long run constraint remains the same, the Thirlwall's law.

IV. Exogenous Net Capital Flows in Kaldor-Thirlwall Models

In this section, we discuss the Kaldor-Thirlwall models that consider long run capital flows as an exogenous variable following Thirlwall & Hussain (1982) and McCombie & Thirlwall (2004). These models aim at further developing upon the balanced trade model we discussed in section II to include long run net capital flows and the possibility of a long run current account deficit. Here, net capital flows are considered as being exogenous. From equation (4) in the previous section, we can arrive at the long run level of output compatible with the BOP constraint given by the no change in external reserves condition for a given *F* and *R* as:

$$Y_{BP} = \frac{X + F - R}{m} \tag{11}$$

Capital flows will have a positive impact on the long run level of output compatible with the BOP constraint if $F > R$, i.e., if new capital inflows are greater than the amount of interest payments in previously acquired debt. In this case, long run output is larger than that of a balanced trade model following Harrod's foreign trade multiplier. But depending on the external financing conditions, capital flows may have a positive or negative impact on long run output, since interest payments can also be larger than the capital flows ($F < R$). In the balanced trade model, we argued that two hypotheses had to be made in order to assume that the BOP is always binding. This is hardly realistic in the case of balanced trade and requires even more implausible assumptions when there are capital flows. Indeed, assuming that the domestic marginal propensity to spend is equal to one is not enough to determine the conditions under which the BOP constraint is always binding.[5] Now there must also be some other autonomous components of demand besides exports (e.g.., government spending) in order to allow for actual output to be compatible with the BOP constraint. This is implausible for two reasons. First, because there is no endogenous market mechanism that would make this other supposedly "autonomous" demand have the exact value required to make the economy hit the level of BOP constrained output (so it is in practice induced by it). Secondly, this level of "autonomous" demand may well have to be equal to zero (if $F = R$) or even negative, in the case that $F > R$ and the BOP constrained level of output with capital flows is lower than the one with balanced trade.

However, the model we find in Thirlwall & Hussain (1982), for instance, does not directly address this issue of the impact of capital flows on the determination of the long run *level* of BOP constrained output.[6] Instead, these models evaluate only the possible

[5] Thirlwall (1982) argues that the presence of any autonomous component of demand other than exports would entail a trade deficit, which is true only when the domestic marginal propensity to spend is equal to one. Thirlwall does not make clear what changes for the determination of the long run level of output regarding the two hypotheses discussed in section II when he moves from the model of balanced trade to the capital flows model. However, since Thirlwall discussed that other autonomous components of demand would yield a deficit in his 1982 paper and also since he never abandoned the idea of a domestic marginal propensity to spend equal to one in any further works, we must assume that the domestic marginal propensity to spend is equal to one and there is some autonomous component of demand other than exports in this model.

[6] Differently from the models with balanced trade like in Kaldor (1978[1970]) and in Thirlwall (1982), there is no equation determining the equilibrium level of output in these models with capital flows nor a discussion on how these variables would affect it.

impact of capital flows on the long run BOP constrained *rate of growth*. Starting from our constraint on the BOP given by equation (11), we derive the long run rate of growth compatible with the BOP constraint as:

$$g_{BP} = \frac{\alpha_1 g_X + \alpha_2 g_F - (1 - \alpha_1 - \alpha_2) g_R}{\pi} \tag{12}$$

where the α's correspond the each component's weight (*X*, *F* and *R*) in the total sum *X*+*F*-*R*. Now, the rate of growth will be greater or lower than Thirlwall's law depending on the rates of growth of *F* (new net capital flows) and *R* and their respective relative weights. But note that if the BOP constrained rate of growth is greater than that indicated by Thirlwall's law, then the rate of growth of imports, which are a function of the growth of the BOP constrained level of output, will then be necessarily faster than the rate of growth of exports. Conversely if g_{BP} in equation (12) is lower than that indicated by Thirlwall's law, exports would necessarily be growing faster than the rate of growth of imports. Of course, it is not realistic to assume that the weights in (12) are exogenous parameters in the long run, since they increase or decrease over time according to differences in rates of growth of the different components of this sum. Nor it is at all reasonable to assume the rate of growth of interest payments bears no connection in the long run with the rate of growth of net capital flows.

Following the framework, we presented in section III, if output grows faster than Thirlwall's law, the external debt-exports ratio will be growing continuously in the long run. This seems to be very unrealistic, since, it is likely that a credit constraint will appear at high levels of debt relative to exports. In the simplified trade balanced model, there was an implicit hypothesis on the limit to the level of debt, where d_{Max} would be zero. Here, the exogenous net capital flows removes any limit to the current account deficit, since this limit cannot be realistically defined by a maximum absolute value of net capital flows, but by some connection between the creation of debt via current account deficits and credit constraints. As we saw in section III above, once we impose this limit to the debt-to-exports ratio, we return to Thirlwall's law as the relevant long run constraint on growth. Thus, if we consider that there is a limit to external debt, it is not reasonable to determine the long run constraint on growth through equation (12) based on the weighted sum of exports, net capital flows and interest payments, because if this sum yields a long run rate of growth greater than Thirwall's law, there is certainly a long run unsustainable path for the debt-to-exports ratio.

To overcome these limitations, it is necessary to include in the analysis of the sustainability conditions of the external debt. This is precisely the route taken in the Kaldor-Thirlwall literature, where exogenous capital flows gave place to some condition of external debt sustainability.

V. Debt Sustainability in Kaldor-Thirlwall Models

In the Kaldor-Thirlwall approach, the external debt sustainability conditions are generally treated through an indicator of external debt sustainability given by the ratio between the current account deficit and domestic output (Moreno-Brid, 1998, 2003; Barbosa-Filho, 2001). These authors establish that as a long run constraint, external debt relative to GDP cannot grow indefinitely[7] so that the rate of growth of net capital flows which pay for the current account deficit must be equal to the rate of growth of domestic output. Again, as in the model of the previous section above, these models do not treat the impact of this proportionality between capital flows and domestic output on the determination of long run level of aggregate output constrained by the BOP, only the extent to which it affects the BOP constrained growth rates and may make this rate of growth different from Thirlwall's law.

As Moreno-Brid (1998) shows, the stability of the proportion between current account deficit and GDP will imply the stability of the stock of external debt relative to GDP as well, which makes the conditions for the former equal the conditions for the latter. Because of this equivalence in this section we shall proceed by using the ratio of external debt relative to GDP as our indicator of debt sustainability in order to compare this model with the framework we presented in section III using debt-to-exports ratio.

First, we have to look to the general conditions that determine debt sustainability in the long run within these models and then proceed to evaluate the implications of these conditions on the determination of long run levels and rates of growth of BOP constrained output. Thus, we start by writing an expression analogous to (7) but relative to GDP instead of exports. Assuming $f = D/Y$, we have:

$$f = m - \frac{X}{Y} + \frac{1+r}{1+g} f_{-1} \tag{13}$$

The first general condition for debt sustainability in equation (13) is that $r < g$,

[7] Barbosa-Filho (2001) refers to this as a "non-Ponzi" condition.

which means that output (giving the impression that, somehow, domestic growth generates capacity to pay foreign debt in this model) must grow faster than the growth of interest payments, or else debt relative to GDP will always grow indefinitely. It is important to note that this condition must always hold for debt to be sustainable in these terms. Thus, for the rest of our argument, we assume that $r < g$.

Secondly, the stability of f also depends on the relation between trade deficit and output. Here we have two possibilities. The first is that output grows at a rate lower or equal to the rate of growth determined by Thirlwall's law. In this case, there is no unsustainable debt, since any rate of growth of output within these limits makes the ratio f above to fall indefinitely. The second possibility, which is more relevant to this model, is when output grows faster than Thirlwall's law, thus creating a growing trade deficit relative to output, as exports grow at an exogenous rate. In this case, we must evaluate if the presence of external debt and a current account deficit can in fact allow for a greater long run rate of growth compared to Thirlwall's law. Hence we need to look closer to the behavior of the ratio of trade deficit relative to GDP when imports grow faster than exports.

If imports grow faster than exports, the level of imports will tend to dominate the level of exports and tend to determine the total value of the trade deficit. This means that this value of the trade deficit relative to GDP will tend to be determined solely by the ratio of imports relative to output, which in our imports function is m. In terms of equation (13) the sum $m - X/Y$ will tend to m. If $r < g$, the equilibrium value for the ratio f will be:

$$f^* = m\frac{1+g}{g-r} \tag{14}$$

Thus, when imports grow faster than exports, the stability of f depends on the behavior of the marginal propensity to import and, hence, on the income elasticity of imports. If the income elasticity of imports is lower than one, output grows faster than imports, m falls and then the debt-to-output ratio falls indefinitely since debt created by imports always grows at a slower pace than output, for any rate of growth of output. If the income elasticity of imports is equal to one, imports grow as fast as output, m is constant and the ratio between debt and GDP is stable, and it is stable for any long run rate of growth of exports. Finally, the income elasticity of imports is greater than one, imports grow faster than output, m grows over time and any creation of debt will be

unsustainable, because debt will grow according to imports, and output is never able to catch up. In this case, a country would eventually have to maintain a balanced trade with zero deficit, as in the Harrod's foreign trade multiplier, where output is constrained by Thirlwall's law.

Barbosa-Filho (2001) arrives at this same result analyzing a model without interest payments, that the stability of the model with unbalanced trade and given long run exchange rates requires that the income elasticity of imports is equal to one. According to him: "[…] the only way to have stable and unbalanced trade in the long run is to impose the auxiliary assumption that the income elasticity of home imports equals one." (p. 131). However, in this case, the ratio f is stable here for any rate of growth of output, which means that, in the same way as the case in which income elasticity of imports is lower than one, there is simply no BOP constraint on long run growth.

Hence, in this model, there is no BOP constraint on growth provided that imports do not grow faster than output (income elasticity of imports less than or equal to 1). Note that the additional condition of the rate of growth of output being greater than the rate of interest on external debt is very easy to meet by policy makers simply increasing the rate of growth of domestic demand. This only shows how inadequate it is to assume that the external debt to domestic output ratio is the relevant condition for debt sustainability.

Moreover, despite the problems with the BOP constrained rate of growth of output described above, the long run level of output compatible with BOP is *indeterminate* is this model. As we argued at the beginning of this section, when the stock of external debt is proportional to GDP, the current account deficit is also proportional to GDP. This allows us to go back to equation (11) for the level of long run output with exogenous capital flows and make the term $F - R$ proportional to output as well. If we make $F - R = jY$, we are able to arrive at the BOP constrained level of long run output in this model, defined by:

$$Y_{BP} = \frac{X}{m - j} \tag{15}$$

The parameter j is the difference between capital flows and interest payments relative to output. If we go back to the BOP accounts, we know that this sum is equal to the trade deficit. Hence, we can rewrite the expression for j as $j = m - X/Y$. If we substitute this expression for j in equation (15), we end up with the relation $Y_{BP} = Y$, which simply states that any level of actual output determines the BOP constrained level

of output. When there is external debt, since in this approach GDP is implicitly assumed to be the measure for the capacity to pay foreign liabilities, output is what is supposedly constrained by the BOP and at the same time what alleviates this same constraint. This is the ultimate reason why output is indeterminate, because debt can be sustainable for any level of output.

This sustainability condition is unusual and unrealistic, as debt is sustainable for any growth rate, even if exports grow much more slowly than imports, as long as imports do not grow faster than output. This problem and the indeterminacy of the BOP constrained level of output are both founded on the fundamental problem of implicitly treating domestic output (instead of exports) as an indicator of external debt repayment capacity. The local government can easily take measures to inject new purchasing power in the economy increasing (private or public) autonomous demand in order to provide (demand led) output growth. However, this injection of purchasing power is not denominated in foreign currency and therefore does not mean a greater availability of foreign exchange to pay for imports.

VI. Final Remarks

In a 1983 paper, while commenting on the condition for long run growth (Thirwall's law) Thirlwall argued that: "The only assumptions needed to produce this result are that in the long run trade must be balanced on current account (*or that there is a constant ratio of capital inflows to export earning*) and that the real terms of trade […] remains constant." (Thirlwall, 1983, p.250; emphasis added)[8]. After developing independently our framework, we interpret this passage as Thirlwall suggesting that Thirwall's law would also be valid in a model with capital flows, if the ratio between capital flows and exports tend to be constant (which would also imply a stable debt to export ratio). However, this, as we have seen, in section IV was not the route taken by Thirlwall himself in the exogenous capital flow models in which it is assumed that imports may grow permanently faster than exports and so can the capital flows (and external debt) to exports ratio. And the literature that tried to further develop the BOP constrained model including debt sustainability conditions also did not follow Thirlwall's suggestion in his 1983 paper as it considered, as we argued in section V above, quite

[8] Quoted in Boianovsky & Solis (2014). These authors also draw attention to the fact that Thirlwall (1983) admits that Raul Prebisch anticipated this law in the 1950's.

unrealistically, a constant ratio of capital inflows relative to domestic output, instead of exports, as the relevant condition for debt sustainability.

In line with Thirlwall's (1983) remark, we have showed that, using the more relevant debt to exports ratio and postulating the existence of credit constraints for high levels of this indicator, including capital flows in the balance of payments constraint will affect the levels but not the BOP constrained rates of growth, as the latter will still be determined by Thirlwall's law.

References

Barbosa-Filho, N. H. (2001). "The balance of payments constraint: from balanced trade to sustainable debt". In: McCombie, J.S.L.; Thirlwall, A.P. (2004). *Essays on Balance of Payments Constrained Growth: Theory and Evidence*. Routledge, Londres.

Blecker, R. A. (2016) "The debate over 'Thirlwall's Law': balance-of-payments-constrained growth reconsidered". *European Journal of Economics and Economic Policies: Intervention*. Vol. 13, issue 3.

Boianovsky, M. & Solis, R. (2014) "The Origins and Development of the Latin American Structuralist Approach to the Balance of Payments, 1944-1964", *Review of Political Economy*, Vol. 26, No.1, pp.23-59

Freitas, F. (2003). "O Modelo Kaldoriano de Crescimento Liderado pelas Exportações" *Anais do XXXI Encontro Nacional de Economia*, 2003.

Harrod, R. (1933). *International Economics*. Cambridge University Press, Cambridge.

Kaldor, N. (1978[1970]), "The case for regional policies", In: Kaldor, N. (1978). *Further Essays on Economic Theory*, N. York: Holmes & Meier.

Kaldor, N. (1978[1971]). "Conflicts in National Economic Objectives", In Kaldor, N., *Further Essays on Economic Theory*, N. York: Holmes & Meier.

Kaldor, N. (1978). *Further Essays on Economic Theory*, N. York: Holmes & Meier.

Lourenço, A. (2011). "Notas sobre os modelos heterodoxos de crescimento para economias abertas na linha de Kaldor e de Thirlwall." In: *IX Encontro Nacional da ABER*, Natal/RN. Anais do IX Encontro Nacional da ABER.

McCombie, J.S.L.; Roberts, M. (2002) "The role of the balance of payments in economic growth" In Setterfield, M (Org.) *The Economics of Demand-led Growth: Challenging the Supply-side Vision of the Long run*, Edward Elgar.

McCombie, J.S.L.; Thirlwall, A.P. (2004). *Essays on Balance of Payments Constrained Growth: Theory and Evidence*. Routledge, Londres.

Medeiros, C.; Serrano, F. (2001). "Inserção Externa, Exportações e Crescimento no Brasil. In: José Luís Fiori; Carlos Medeiros (Org.). *Polarização Mundial e Crescimento*. Petrópolis, Vozes.

Moreno-Brid, J. C. (1998). "On capital flows and the balance-of-payments-contrained

growth model". *Journal of Post Keynesian Economics*, Winter 1998/1999, Vol.21, No.2.

Moreno-Brid, J. C. (2003). "Capital Flows, Interest Payments and the Balance-of-Payments Constrained Growth Model: A Theoretical and Empirical Analysis," *Metroeconomica*, Wiley Blackwell, vol. 54(2-3).

Setterfield, M. (2011) "The Remarkable Durability of Thirlwall's Law". PSL Quarterly Review. Vol 64, vol 259.

Thirlwall, A. P. (1979). "The balance of payments constraint as an explanation of international growth rate differences". in: McCombie, J.S.L.; Thirlwall, A.P. (2004). *Essays on Balance of Payments Constrained Growth: Theory and Evidence. Routledge*, Londres.

Thirlwall, A. P. (1983) "Foreign trade elasticities in centre-periphery models of growth and development", *Banca Nazionale del Lavoro Quarterly Review*, 36, pp. 249-261.

Thirlwall, A. P. (2002) *The Nature of Economic Growth: An Alternative Framework for Understanding the Performance of Nations*. Edward Elgar, UK.

Thirlwall, A. P.; Hussain, M. N. (1982). "The balance of payments constraint, capital flows and growth rate differences between developing countries". In: McCombie, J.S.L.; Thirlwall, A.P. (2004). *Essays on Balance of Payments Constrained Growth: Theory and Evidence*. Routledge, Londres.