Competitiveness, Income Distribution and Economic Growth in a Small Economy

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1. Introduction

The first half of the 1980s saw the publication of two very influential works within the structuralist/post keynesian tradition on growth and distribution (Dutt, 1984[1] and Rowthorn, 1982). These contributions challenged the conventional view that wages and growth are negatively correlated. By assuming Kaleckian mark-up pricing and including a flexible rate of capacity utilization in the investment function, these models were able to generate a positive relationship between real wages and the rates of profit and economic growth. These articles were later extended in Taylor (1985) or further explained and criticized in various ways by Bhaduri and Marglin (1990), Dutt (1990), Taylor (1991), Lavoie (1995, 2006), and Barbosa (2001), among several others.

These models, labeled Kakeckian by Lavoie (1995) to distinguish them from the Cambridge tradition of the 1950s and 1960s, were extended to an open economy in several works, the most representative of them being Blecker (1989). His main result was that international competition may impose restrictions on the extent to which an open economy may follow a wage-led growth process. Blecker follows the main features in Dutt's initial article (especially with respect to the investment rate function), and introduces the necessary modifications to describe the open economy.

The literature in this tradition is here extended by means of a system that examines the behavior of a small-open economy, and the dynamic interaction between international competitiveness and income distribution. It is shown that the relevant variable in stimulating effective demand is not real wages, but international competitiveness; the distribution of income has no effect on the rates of profit or economic growth.

From a dynamic perspective, our model generates a negative association between outward orientation policies and the wage share. But we show that this pattern may be broken if an institution is developed that encourages labor productivity when international competitiveness declines. Finally, economic growth is endogenous in this model.

The article extends the existing literature within the post keynesian tradition, and challenges important results obtained by previous authors within that tradition, especially on the feasibility of wage-led growth: international competitiveness is shown to be a more relevant determinant of effective demand and growth. The existing literature is extended to a dynamic setting, but also, and more importantly, this paper shows that government intervention is necessary to create a more favorable relationship between the wage share and international competitiveness. The development of appropriate institutions

1 Based on his dissertation Dutt (1982).

is critical to allow wages and competitiveness to move in the same direction.

The recent wave of trade agreements and the attempts by developing nations to pursue export-led growth, has led to severe criticism on the impact that these actions could have on the distribution of income. The goal of attaining a closer integration with the world economy through an increasing volume of exports has generated fears that wage-based competition could become a more pervasive phenomenon. But our result in this article shows that that need not be the case: if governments develop appropriate institutional frameworks a closer integration with the global economy may be compatible with increasing real wages.

2. Main features of the model

Some of the assumptions that we use here respond to the model-building tradition in the structuralist literature, while others are aimed at simplifying the analysis. The conditions presented in this section allow to solve the model in the short-run, and to then use such solution to examine the long-run interaction between income distribution and international competitiveness. The specific assumptions are listed below.

1. The country produces a consumption good "Q" by means of a fixed-coefficient production function: $Q = Min\left\{ \frac{L}{a}, u\ K \right\}$, where L represents the labor input, "a" is a technical coefficient, K is the capital stock, and "u" represents the output/capital ratio. The domestic good Q may be exported or consumed locally.

2. Firms fix prices by charging a mark-up over variable costs, and the goods market clears in the short-run through quantity adjustments. Producers are thus assumed to hold excess capacity, so that the capital/output ratio (u) becomes a variable that moves up (down) when capacity utilization increases (decreases).

3. Imports take the form of a composite good, which can be used for consumption or investment purposes. There is no local production of investment goods, so all capital within the country is imported.

4. The country is small in that it cannot affect the exogenous international price of its imports P^M. The domestic price of imports is, of course, eP^M, where e represents the nominal exchange rate (number of units of local currency to be paid for one unit of foreign currency). The small size of the country does not, however, prevent firms from fixing their own local price, as explained in assumption 2 above.

5. There are two social classes: producers and workers. Workers spend all their wage income on consumption of both the local and the imported good, while producers save a fixed portion "s" of their profit income and the rest they spend on consumption of both the domestic and imported goods.

6. The interest rate is determined exogenously by the Central Bank.

7. The capital stock K does not depreciate and, along with the labor force N is assumed given in the short-run, although they may adjust in the long-run.

8. The nominal exchange rate "e" is a policy variable that remains fixed in the short- run, but is adjusted in the long-run by the Central Bank. The monetary authority is assumed to set a target for the real exchange rate, and adjusts the nominal rate in order to remain close to the target.

9. The real exchange rate, which determines the competitiveness of exports, is defined as:

$h = \frac{e\ P^M}{P^Q}$, with P^Q the price of the domestic good (assumed fixed in the short-run), and both e and P^M were already defined. The assumptions that P^M is exogenous, and both e and P^Q remain given in the short-run, guarantee that also h remains fixed in this period.

10. The wage share is defined as $A = \frac{W\ a}{P^Q}$, with W representing the nominal wage, and the other symbols were already explained. If we assume that W and the technical coefficient a are given in the short-run, along with P^Q, then the value of A will also be known in the short-run.

3. General overview

Macroeconomic equilibrium is found when the investment rate equals the total savings rate. In the short-run, with foreign savings determined by the known real exchange rate, and with given domestic prices, the output/capital ratio adjusts to clear the goods market. Then, the employment rate may be derived, given the sizes of the capital stock and labor supply. It will be shown that changes in the distribution of income have no effect on the profit and growth rates, although there will be an impact on the employment rate. In the long-run, we assume that the variables that adjust in the short-run, remain at their short-run equilibrium position. In the long-run, we analyze the behavior of three state variables: the real exchange rate (h), the wage share (A), and the capital/labor force ratio (k). The role of an institution promoting competitiveness will be addressed once the long-run section of the model is built.

3.1 *Equations of the model*

It may be shown (as in Cordero, 2002) that, with the assumptions presented above, total savings (g^s) equals domestic savings (sr) plus foreign savings (f), as equation (1) indicates. The profit rate is represented by r, and s is the constant portion of profits saved by producers.

Table 1

(1) $g^s = s\,r + f$

(2) $g^d = b_0 + b_1\,r$

(3) $r = \frac{u}{h}(1 - A)$

(4) $f = f(h),\ \ f_h < 0$

(5) $P = (1+z)Wa$

(6) $g^s = g^d = g$

(7) $\frac{L}{N} = \frac{L}{Q}\frac{Q}{K}\frac{K}{N} = l = auk$

The next expresion in the table indicates that the desired investment rate g^d depends positively on the rate of profit (both b_0 and b_1 positive parameters), thus making this presentation similar to the Neokeynesian model in Marglin (1984). There is, however, an important difference: in Marglin's model the output/capital ratio is fixed at the full capacity level, while in the model presented here such a ratio is flexible. This latter characteristic brings us closer to Rowthorn (1982), Dutt (1984), Taylor (1995) and Blecker (1989), but our formulation differs from theirs in that we do not include the output/capital ratio as another term in the investment function.

We also depart from Bhaduri and Marglin (1990), whose desired accumulation function depends separately on the determinants of the rate of profit (output/capital ratio and profit share), instead of the rate of profit itself. The implications of our specification of the desired accumulation function will be explained in more detail in the next section.

Equation (3) defines the rate of profit. Expression (4) indicates that the trade deficit (f) depends negatively on the real exchange rate (h). In (5) the price of the domestic good is fixed by charging an exogenous mark-up (z) over variable costs. The equilibrium condition is provided in (6), and in (7) the employment rate is defined in terms of the labor input coefficient (a), the capital/output ratio (u), and the K/N ratio (k).

3.2 *Short-run equilibrium*

In the short-run, equation (5) allows to fix the wage share (A) and this we can use to find, from (3), the level of the output/capital ratio that is consistent with macroeconomic equilibrium , as described by (1), (2), (4) and (6). Then, we may look into the labor market in order to determine the employment rate in expression (7). The graphical solution is depicted in figure No. 1, and the equilibrium level for the short-run variables of the model may be seen in table No. 2.

Table 2

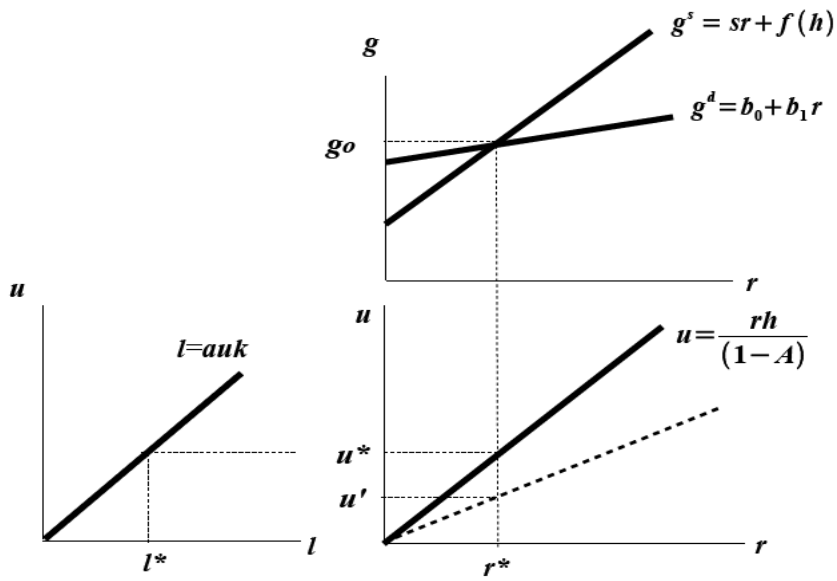
(8) $$r^* = \frac{b_0 - f(h)}{s - b_1}$$

(9) $$r^* = r[h], \quad r^*_h > 0$$

(10) $$u^* = \frac{r^*[h]\,h}{(1 - A)}$$

(11) $$g^* = \frac{s\,b_0 - b_1\,f(h)}{(s - b_1)} = g^*(h), \; g^*_h > 0$$

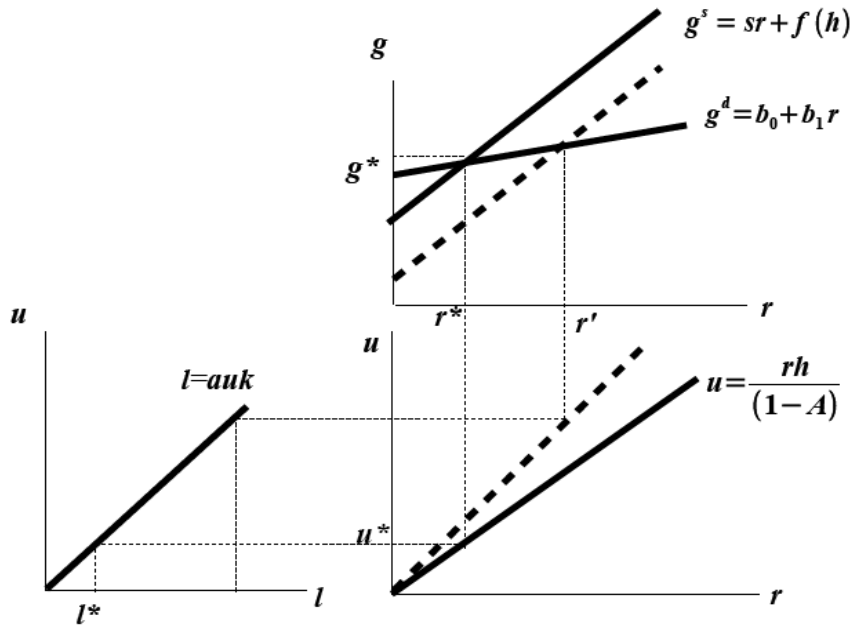
Figure No. 1



If the small country wishes to promote competitiveness by means of a lower wage share, then, in the short-run, there will be no change in the rate of profit or in the growth performance of the economy. But both u and l will experience a decline.

When competitiveness is raised by means of a higher real exchange rate, net imports decline and f moves up, and the total savings line shifts down, thus increasing the rates of growth and profit of the economy. The employment rate will also increase as a result of a higher level of h (see figure No. 2).

Figure No. 2



The moral of this excercise is that, if we wish to stimulate the level of activity of the small economy, the best way to proceed would be to increase the real exchange rate. What's happening here is that, of course, a higher wage share (A) brings u up. But also the higher A has a direct negative effect on the rate of profit. In the end, the stimulating effect that a higher A has on u, is fully compensated by the contracting effect that a higher A has on r according to equation (3).

What Rowthorn (1982) and Dutt (1984) do, is they make the desired accumulation function depend on both r and u, so that, the stimulating effect that a higher A has on u is forced to prevail over the discouraging effect that a higher A has on r. In their work the result is, obviously, that economies will grow faster when they follow a wage-led regime. It is clear that, as mentioned before, in an open economy their result would be limited by the effect of wages on international competitiveness (as in Blecker , 1989).

4. Long-run analysis

We now look into the long-run dynamics of the model. In this section we allow for variations in nominal wage, domestic price, labor/output technical coefficient a (i,e. the inverse of labor productivity), nominal exchange rate, capital stock, and size of the labor force. In this section, we assume that the variables that adjust in the short-run (output/capital ratio, rate of profit, and rate of economic growth), remain at their short-run equilibrium level.

The equations representing long-run adjustment appear in table 3. Thus, (12) describes the motion of the wage share, with the "hats" denoting rates of growth. Average labor productivity (the inverse of the coefficient a) grows at a rate given by $\hat{y}$. Wage inflation is explained in (13) as a result of the gap between a desired or targeted wage share (assumed exogenous and denoted A_W) and the actual share A.

Table 3

(12)	$\hat{A} = \hat{W} - \hat{P^Q} - \hat{y}$
(13)	$\hat{W} = \theta\,(A_W - A)$
(14)	$\hat{P^Q} = \beta\,(g^d - g^s)$
(15)	$\hat{y} = \tau\,(g - g_0)$
(16)	$\hat{h} = \hat{e} - \hat{P^Q}$
(17)	$\hat{e} = \Omega\,(h_0 - h)$
(18)	$\hat{k} = \hat{K} - \hat{N}$
(19)	$\hat{K} = g$
(20)	$\hat{N} = n\,(k)\,, \quad n_k > 0$

In (14), price inflation is presented as a result of an excess demand for goods and services; that is, the gap between the rates of investment (g^d) and saving (g^s). Expression (15) shows that labor productivity rises when the rate of accumulation (g) goes beyond a certain critical level (g_0). This is motivated by the usual learning-by-doing argument of Arrow (1962). The motion of the real exchange rate appears in (16), while the next (17) suggests that the nominal exchange rate is utilized as an instrument to maintain the real rate close to a policy-determined target (h_0). The next three expressions in the table allow examining the determination and stability of k.

In order to build the system we plug (13), (14), and (15) into (12), and get:

$$(21) \qquad \hat{A} = D - \theta A - \beta\Big[(b_1 - s)\, r^*(h) - f(h)\Big] - \tau\Big(s\, r^*(h) + f(h)\Big)$$

where D represents the constant terms in the various equations utilized in (13).

And then we plug (14) and (17) into (16) to get the other equation in our system:

$$(22) \qquad \hat{h} = \Omega\, h_0 - \beta\, b_0 - \Omega\, h - \beta\Big[(b_1 - s) r^*(h) - f(h)\Big]$$

The third expression in the system is derived by substituting (19) and (20) in the equation of motion for k (that is 18):

$$(23) \qquad \hat{k} = g^{*}(h) - n(k)$$

and the value of g has been substituted by its short-run equilibrium value (equation 11).

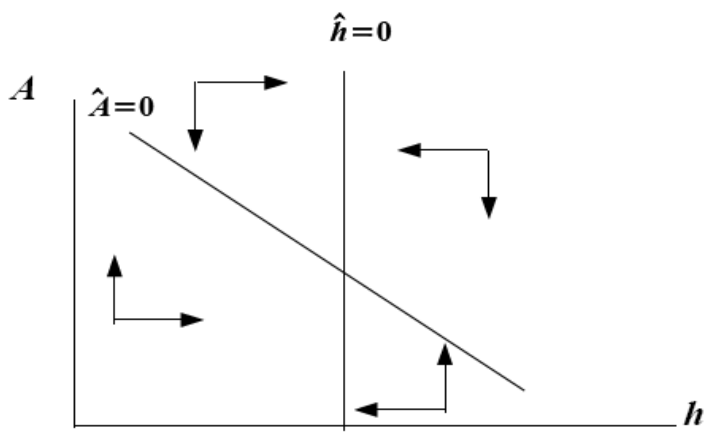
Notice that (21) and (22) are independent of k, so using those we may find long-run equilibrium values for A and h. The value of h may then be inserted in (23) to examine the stability properties of (23) alone. We will look into this more deeply below, but now we concentrate on analyzing the stability properties of the system defined by (21) and (22). The corresponding jacobian matrix is given by:

$$J = \begin{bmatrix} \frac{\partial \hat{A}}{\partial A} & \frac{\partial \hat{A}}{\partial h} \\ \frac{\partial \hat{h}}{\partial A} & \frac{\partial \hat{h}}{\partial h} \end{bmatrix} = \begin{bmatrix} -\theta & \frac{b_1 \tau f_h}{(s - b_1)} \\ 0 & -\Omega \end{bmatrix}$$

It is clear that the determinant is positive and the trace is negative, which implies that the long-run equilibrium is stable. The phase diagram is shown in figure 3.

Now a final word on the long-run solution. The system formed by (21) and (22) finds equilibrium values for A and h, which may then be utilized in (23) to solve for the long-run equilibrium value of k. The economy will converge to this value of k if, as assumed here, $n_k > 0$.[2] Notice also that the model is able to generate endogenous growth as, from (23), the rate of economic growth is determined by h, which is itself determined within the dynamic system.

Figure No. 3

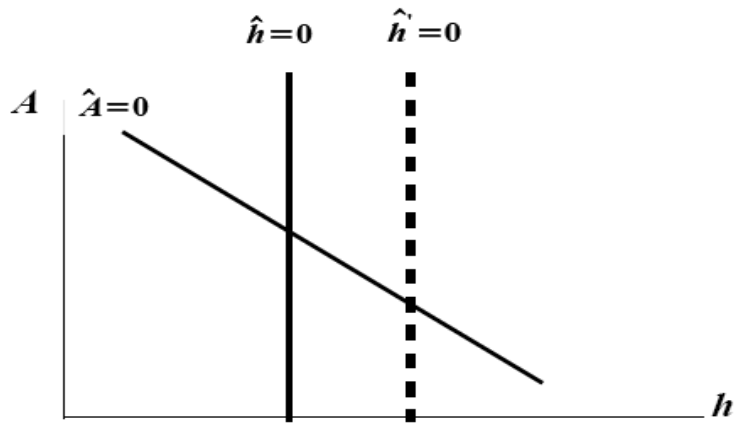


2 The assumption that $\hat{N}$ be a positive function of k may be seen as too simplistic here. However, it may be assumed that $\hat{N} = n(A, k)$ with the corresponding partial derivatives defined as positive. The idea would be that workers will feel more inclined towards enbe entered into (23) to then solve for k.

5. Comparative dynamics

In this section we examine the interaction between the distribution of income and international competitiveness. The starting point is the diagram in figure No. 4. We suggest that a government that is very concerned with the competitiveness of exports, will attempt to increase the pace of nominal devaluation in order to raise the real exchange rate. In terms of economic policy this may be seen as an increase in h_0 in equation (17). The result would be a rightward shift in the $\hat{h}=0$ schedule, which would lead to a higher level of competitiveness (*h*), but a lower wage share. This kind of result would feed the concerns over the distributive impact of policies aimed at increasing exports and the integration with the world economy.

Figure No. 4



But this also has an impact on our perception of the relationship between wages and economic growth. We recall that, in the short-run, higher wages did not affect the rate of economic growth. But in the long-run, the small-open economy cannot attain a wage-led growth regime: here competitiveness (and thus economic growth from equation 11), can only be associated to a lower wage share.

This outcome, however, may be modified if we introduce slight modifications into the system. First we bring in a variable denoted by B, which represents an institutional framework that allows the government to adopt policy measures to raise productivity whenever the profit share or the level of competitiveness decline.[3] We thus assume that

$$(24) \qquad B = B(A, h), \quad B_A > 0, \quad B_h < 0$$

In other words, when profitability falls (and A increases), the government tries to increase productivity in the business sector (B goes up) so $B_A > 0$. And when competitiveness declines, the government also attempts to raise productivity so $B_h < 0$. The argument then would be that, in order to maintain high levels of activity and investment, the government tries to maintain profitability and

3 These policy measures may include the organization and funding of training programs, and methods to encourage innovation and/or research and development activities.

competitiveness; but it tries to do so by increasing productivity rather than by restricting wage growth.

Next we replace our labor productivity growth expression (15) with a new specification to capture the existence of an institutional framework:

$$(25) \qquad \hat{y} = \tau\left[\, g\,, B(A,h)\right]$$

Thus, productivity growth will now respond to the rate of accumulation (as in 15 before), and will also respond positively to productivity-enhancing policies. Our equation (21) is then replaced by the following expression:

$$(26) \qquad \hat{A} = D - \theta A - \beta\left[(b_1 - s)\, r^*(h) - f(h)\right] - \tau\left\{\left[s r^*(h) + f(h)\right],\ B(A,h)\right\}$$

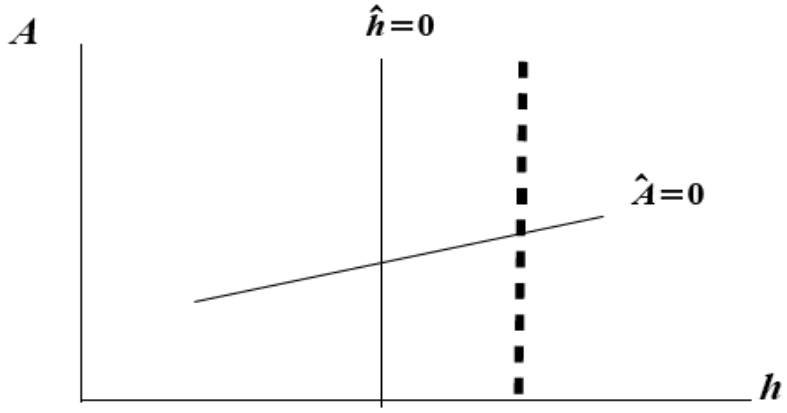
where again D represents constant terms and, of course, the equation of motion for h (22) does not change. The new dynamic system is made up of two expressions: (22) and (26). It is easily shown that the long-run equilibrium will still be stable as the determinant and trace remain positive and negative, respectively.

We will, however, find a difference in the slope of the $\hat{h}=0$ isocline, which becomes less negative with the introduction of the B variable into the model. The slope is represented by:

$$\frac{dA}{dh} = \frac{\tau}{\theta + \tau B_A}\left\{\frac{b_1 f_h}{s - b_1} - B_h\right\}$$

which could well become positive if investment is very responsive to the rate of profit, and the productivity-enhancing programs are very responsive to changes inn the level of competitiveness. In this case, as shown in figure No. 5, higher wages are now compatible with faster economic growth, and closer interaction with the world economy should not be feared by labor activists.

Figure No. 5



6. Concluding remarks

This article develops a model which formalizes the dynamic interaction between economic growth, competitiveness, and the distribution of income. It is shown that in the short-run, a wage-led growth regime is not possible, and that in the long-run faster growth can only be attained as a result of a lower wage share.

This outcome, however, is reversed (or at least mitigated) when the government steps in with active policy measures to induce higher levels of labor productivity. Under these conditions, higher wages are compatible with more exports and economic growth in the long-run.

The model has also made a contribution to the literature on the determinants of economic growth within a small-open economy, and on the introduction of institutional characteristics within formal models of economic growth. Finally, the article shows that, in small-open countries, growth is endogenous, and mostly driven by international competitiveness.

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