

Competitiveness, Income Distribution and Economic Growth in a Small Economy

Jose Antonio Cordero*
jose.cordero@ucr.ac.cr
Department of Economics
Universidad de Costa Rica
San Jose, COSTA RICA
February, 2008

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, 1984¹ 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). He showed that international competition may impose restrictions on the extent to which an open economy may follow a wage-led growth process. He 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.

Blecker's is a short-run model in which a lower mark-up leads to more spending by workers and an increase in net exports. The result is higher rates of capacity utilization and faster growth, but this also promotes imports which push down net exports, hence partially neutralizing the initial expansion of capacity and capital accumulation. Thus, in this open economy, it is not clear that lower mark-ups (higher wage shares) would have a favorable effect on economic growth. International competition is then shown to put a limit on the extent to which a wage-led growth process is feasible.

The model I develop in this article is different from Blecker's in that the adjustment process takes place over different periods. The use of these different stages allows to examine in detail the dynamic relationship that exists, in the long-run, between income distribution and competitiveness. Thus, in the short-run, savings and investment are brought to equality by means of adjustments in capacity utilization and employment; the wage share, competitiveness, and the capital stock remain fixed in the

* I would like to thank the Ministerio de Ciencia y Tecnología (MICIT) en Costa Rica for financial support. Also I appreciate useful comments and suggestions from participants at the Conference on "The Institutional and Social Dynamics of Growth and Distribution," held in Lucca, Italy in December 2007.

¹ Based on his dissertation (Dutt, 1982).

short-run, but may adjust in the long-run.

With this framework, the feasibility of wage-led growth is, again, challenged and competitiveness arises as the most important determinant of economic growth. The paper goes even further to examine the dynamic interaction between income distribution and international competitiveness: it is shown that outward orientation policies stimulate net exports, but also cause a decline in the wage share.

Appropriate government intervention could break this pattern and allow both 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:

$$Q = \text{Min} \left\{ \frac{L}{a}, u K \right\}, \text{ where } L \text{ represents the labor input, “} a \text{” is a technical coefficient, } K \text{ is the}$$

capital stock, and “ u ” represents the output/capital ratio. The domestic good Q may be exported or consumed locally.

2. Firms fix local 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:

$$h = \frac{e P^M}{P^Q}, \quad \text{and both } e, P^Q \text{ and } P^M \text{ were already defined. The assumptions that } P^M \text{ is exogenous,}$$

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 is also 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.²

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 the first equation in table 1 indicates. The profit rate is represented by r , and s is the constant portion of profits saved by producers.

² A similar setting, but for a monetary economy, may be seen in Cordero (2008).

Table 1

$$\begin{aligned} (1) \quad & g^s = s r + f \\ (2) \quad & g^d = b_0 + b_1 r \\ (3) \quad & r = \frac{u}{h} (1 - A) \\ (4) \quad & f = f(h), \quad f_h < 0 \\ (5) \quad & P = (1 + z) W a \\ (6) \quad & g^s = g^d = g \\ (7) \quad & \frac{L}{N} = \frac{L}{Q} \frac{Q}{K} \frac{K}{N} = l = auk \end{aligned}$$

The next expression 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 Neoknesian model in Marglin (1984). There is, however, an important difference: in Marglin the output/capital ratio is fixed at the full capacity level, while 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 while (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 capital/labor force ratio (K/N), denoted by 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) and given h , 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, where the subindices in each variable denote partial derivative.

Table 2

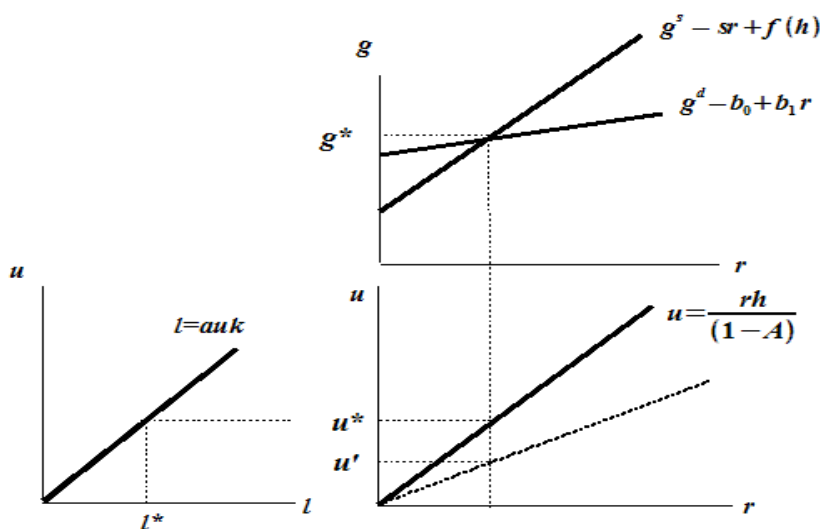
$$(8) \quad r^* = \frac{b_0 - f(h)}{s - b_1}$$

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

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

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

Figure No. 1

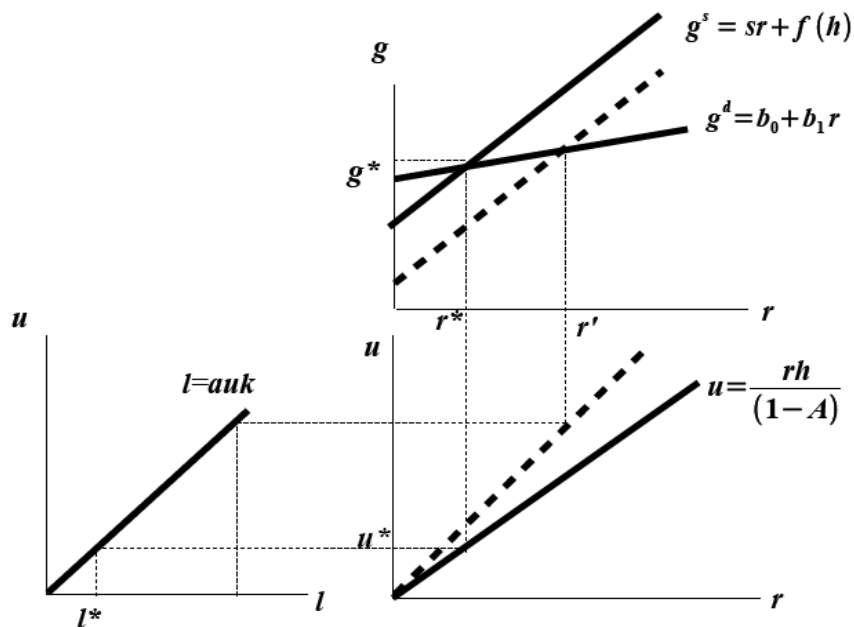


If the small country wishes to promote competitiveness by means of a lower wage share, then, in the short-run, there will be no change in the rate of profit or in the growth performance of the economy. But both u and l will experience a decline.

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, as well as the employment rate (see figure No. 2).

Our results are very different from the ones that have been obtained in the previous literature. On the one hand, they differ from the traditional Neokeynesian results (for example Kaldor, 1956; Marglin, 1984), in that a lower wage share will not stimulate economic growth. But on the other hand, a higher wage share will not make the trick either: a wage-led growth process is not feasible in this model.

Figure No. 2



Let us analyze more closely what goes on here. It is clear that 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).

In Rowthorn (1982) and in Dutt (1984), however, desired accumulation is made dependent 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. But this is no longer possible if the output/capital ratio (u) is taken out of the desired accumulation function.

An interesting question would refer to the reasons that lie behind the deletion of the output/capital ratio from the desired investment function. And the response here would be that accumulation rates respond mainly to profitability. The effect of higher utilization rates should be observed in the rate of profit, and thus there is no need to put u as a separate argument in the investment function.

Our main conclusion is thus that neither higher nor lower wages will be capable of bringing the economy to a faster pace of capital formation. In the end, higher rates of growth will only be attained through the promotion of international competitiveness.³

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, and employment rate), 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

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

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). The idea is that, in the long-run, the motion in our state variables may cause disparities between investment and saving that will make prices adjust. 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

3 The trade deficit (f) could be made dependent on both competitiveness (h) and the output/capital ratio (u) with the partial derivative of f with respect to u , positive. It can be shown that in this case a higher wage share would lead to a lower rate of growth.

the nominal exchange rate is utilized as an instrument to maintain the real rate close to a policy-determined target (h_0) . The motion of k is presented in (18), while (19) indicates that, without depreciation, net investment equals the rate of growth of the capital stock. In equation (20) we assume that labor supply will increase at a faster pace as the level of capital is bigger with respect to the labor force. The argument is that, as people observe a higher ratio of capital to the labor supply, they will be more willing to enter the labor market with the expectation that conditions would become more favorable to workers.

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

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

where D represents the constant terms in the various equations utilized in (12).

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

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

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

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

and the value of g has been substituted by its short-run equilibrium value (equation 11). The long-run segment of the model has three differential equations in three unknowns: A, h, k .

Notice now 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 that equation, and it is clear that the economy will converge to the equilibrium level of k when (as assumed in 20), $n_k > 0$. Notice also that the model is capable of generating endogenous growth as, from (23), the rate of economic growth is determined by h , which is itself determined within the dynamic system.

Next we concentrate on analyzing the stability properties of the system defined by (21) and (22). The corresponding jacobian matrix is given by:

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

The determinant is

$$Det(J) = \theta \Omega$$

and the trace is given by

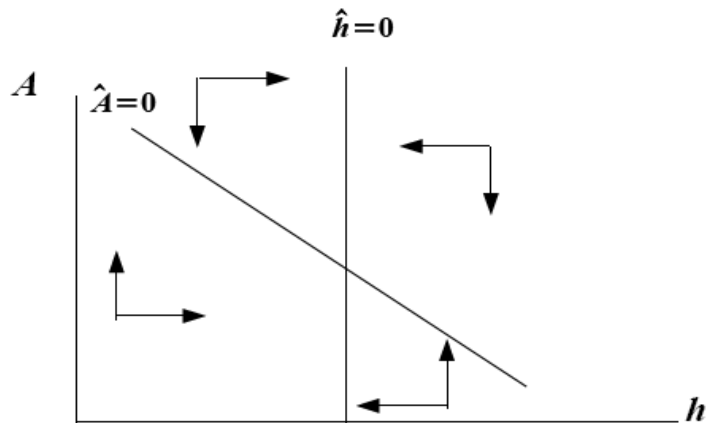
$$Tr(J) = -\theta - \Omega$$

The determinant is positive and the trace is negative, so the long-run equilibrium is stable. The phase diagram is shown in figure 3. The slope of the $\hat{A} = 0$ line (equation 21) in the phase diagram is represented by:

$$(24) \quad \frac{\partial A}{\partial h} = \left(\frac{b_1}{(s - b_1)} \right) \frac{\tau f_h}{\theta}$$

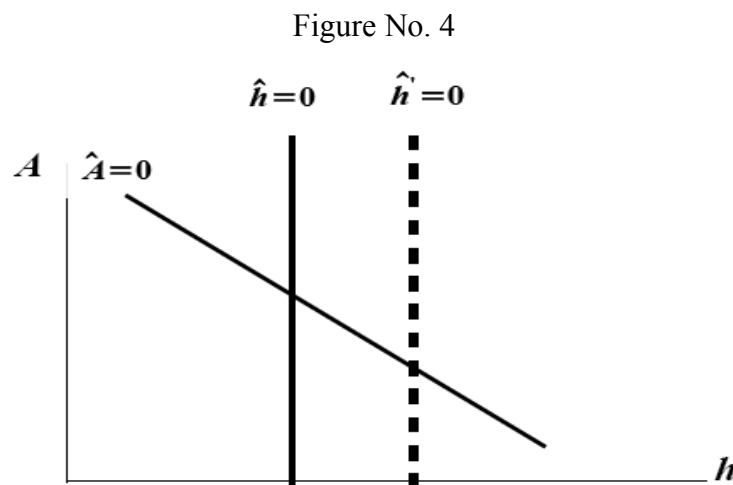
which is negative. The $\hat{h} = 0$ line is vertical at the long-run equilibrium value of h .

Figure No. 3



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. From (11), the rise in h brings the economy to a higher rate of growth, but only at the expense of income distribution. 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.



This outcome, however, may be modified if we introduce slight changes 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.⁴ The process is assumed to work in the following way. The government steps-in by collecting a given amount of tax from firms, and this amount is then utilized by the public sector to create institutions and programs which promote productivity growth. The government's budget is assumed to remain balanced, so this modification only changes the profit and output/capital rates.

The profit rate is now defined as:

$$r = \frac{PQ - T - WL}{eP^M K}$$

which simplifies to

⁴ These policy measures may include the organization and funding of training programs, and methods to encourage innovation and/or research and development activities.

$$(25) \quad r = \frac{u}{h} [1 - t - A]$$

where t represents the ratio of tax revenue to the value of output, and is assumed exogenous.

The short-run equilibrium level of the profit rate is still represented by (8) and (9), but the level for the output/capital ratio will change to

$$(26) \quad u^* = \frac{r^*[h] h}{1 - t - A}$$

and the remaining expressions in the previous sections will not change as long as the government budget remains balanced.

With these qualifications we can define more clearly the behavior of our institutional variable B :

$$(27) \quad B = B(A, h), \quad B_A > 0, \quad B_h < 0$$

so 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 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:

$$(28) \quad \hat{y} = \tau [g, B(A, h)]; \quad \tau_g > 0; \quad \tau_B > 0$$

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 replaced by the following expression:

$$(29) \quad \hat{A} = D - \theta A - \beta [(b_1 - s) r^*(h) - f(h)] - \tau \{ [s r^*(h) + f(h)], B(A, h) \}$$

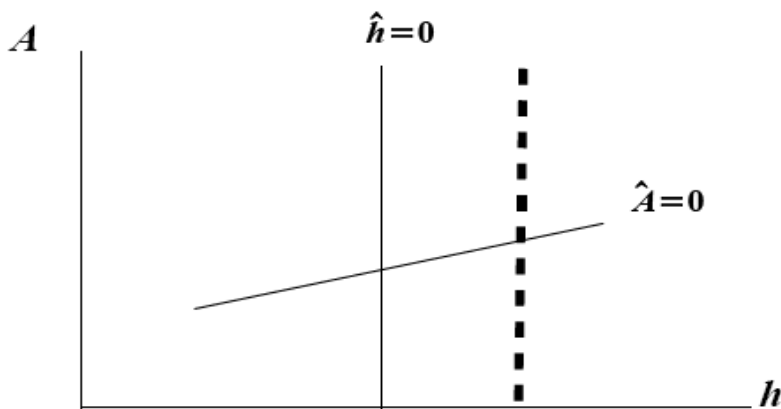
where again D represents constant terms and, of course, the equation of motion for h (22) does not change. The new dynamic system is made up of two expressions: (22) and (29). It is easily shown that the long-run equilibrium will still be stable as the determinant and trace remain positive and negative, respectively.

We will, however, find a difference in the slope of the $\hat{A}=0$ isocline, which becomes less negative with the introduction of the B variable into the model. From (29), the slope is represented by:

$$(30) \quad \frac{dA}{dh} = \frac{\tau}{\theta + \tau B_A} \left\{ \frac{b_1 f_h}{s - b_1} - B_h \right\}$$

which is clearly less negative than the expression in (24), and could even become positive if B_h is very negative. In this case, as shown in figure No. 5, higher wages are now compatible with outward orientation, 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, outward orientation leads to higher levels of competitiveness and growth, but at the expense 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, the Central Bank measures to improve competitiveness, are compatible with a higher wage share.

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.

References

- Arrow, K. (1962). "The Economic Implications of Learning by Doing," *American Economic Review*.
- Barbosa, N. (2001). "Effective Demand and Growth: An Analysis of the Alternative Closures in Keynesian Models," CEPA Working Paper 2001-05, Center for Economic Policy Analysis, New School University.
- Bhaduri, A., and Marglin, S. (1990). "Unemployment and the Real Wage: The Economic Basis for Contesting Political Ideologies," *Cambridge Journal of Economics*, vol. 14, No. 4.
- Blecker, R. (1989). "International competition, income distribution and economic growth," *Cambridge Journal of Economics*, 13, 345-412.
- Cordero, J. A. (2002). "A Model of Growth and Conflict Inflation for a Small Open Economy," *Metroeconomica*, vol. 53, number 3, August.
- Cordero, J. A. (2008). "Economic Growth under Alternative Monetary Regimes: Inflation Targeting vs Real Exchange Rate Targeting," *International Review of Applied Economics*, forthcoming.
- Dutt, A.K. (1982). "Stagnation, Income Distribution and Monopoly Power," unpublished Ph.D. Dissertation, Cambridge: Massachusetts Institute of Technology.
- Dutt, A. K. (1984). "Stagnation, income distribution and monopoly power," *Cambridge Journal of Economics*, vol. 8, No. 1.
- Dutt, A. K. (1990). *Growth, Distribution and Uneven Development*, Cambridge: Cambridge University Press.
- Kaldor, N. (1956). "Alternative Theories of Distribution," *Review of Economic Studies*, 1956.
- Lavoie, M. (1995). "The Kaleckian Model of Growth and Distribution and its Neo Ricardian and Neo Marxian Critiques," *Cambridge Journal of Economics*.
- Lavoie, M. (2006). "Do Heterodox Theories Have Anything in Common? A Post Keynesian Point of View," *Intervention. Journal of Economics*, vol. 3, No. 1, pp. 87-112.
- Marglin, S. (1984). *Growth, Distribution and Prices*, Cambridge: Harvard University Press.
- Rowthorn, R. (1982). "Demand, Real Wages and Economic Growth," *Study Economici*, 18.
- Taylor, L. (1985). "A Stagnationist Model of Economic Growth," *Cambridge Journal of Economics*.
- Taylor, L. (1991). *Income Distribution, Inflation and Growth: Lectures on Structuralist Macroeconomic Theory*, Cambridge: The MIT Press.