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Kaleckian Effective Demand and Sraffian Normal Prices: towards a reconciliation

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Sraffians and Kaleckians alike reject the belief that higher rates of accumulation need be associated with lower real wage rates or higher propensities to save. The rejection of this proposition is mainly based on the endogeneity of the rate of capacity utilization, both in the short and the long run. This endogeneity often relies on a discrepancy between the realized and the normal rates of profit, or between the realized and the target rate of capacity utilization, a discrepancy which some authors believe is unwarranted in long run analysis. Various models that eliminate this divergence are outlined. In all these models, the normal rate of profit itself is taken as an endogenous variable. In the first two models, the normal rate of profit depends either on the realized profit rate or the rate of interest. Supply-led results may then reappear in long run analysis. In the last model, one introduces the possibility of a divergence between the rate of return as assessed and targeted by firms, and the rate of return that is actually incorporated into prices. This divergence arises because of the bargaining power of workers and their real wage resistance. Under these conditions, the demand-led results of the Kaleckian tradition are recovered in a model with definite solutions.

1. Introduction

The Sraffian and post-Keynesian traditions are often associated with each other. There are historical reasons for this association, since these traditions both originated at the University of Cambridge. While all agreed that full employment, if left to market forces could only occur occasionally, substantial theoretical disputes arose between the two schools, in particular on the relevance and relative importance of long period analysis compared with short-period investigation. Despite these disputes, however, a large range of agreement has remained, in particular about a most crucial issue, the causal role played by effective demand in the theory of accumulation. The causality involved can most simply seen by making use of the well-known Cambridge equation, $r = g/s_p$. The *classical* interpretation of this equation in a world divided into two social

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classes, one of which (the working class) does not save, is that the rate of accumulation g is an endogenous variable, which is higher when either the normal rate of profit r or the propensity s_p to save out of profits (earned by capitalists) is higher. This classical interpretation is consistent with the views recently developed by *neoclassical* authors within the framework of the so-called *new growth theory*. The crucial distinctive feature of these models, in contrast to the previous neoclassical Solow model, is that the steady-state rate of accumulation g is an endogenous variable. Essentially, this steady-state rate of accumulation is determined by the rate of return on capital and the propensity to save. These two variables are exogenous, determined respectively in the production sphere (by technology alone) and by the preferences of consumers. Since many of these new growth models assume that all factors of production are capital, physical capital or human capital, all incomes appear as returns on capital, and hence with a single propensity to save out of income, we are back to the Cambridge equation. We are also back to the classical interpretation of this equation, since a higher propensity to save and a higher rate of profit generate a higher rate of accumulation.

The classical and the new neoclassical analyses of growth thus have much in common (Kurz, 1997). From the point of view of effective demand, these analyses are supply-led in the sense that higher savings generate higher growth rates. This must be contrasted to the post-Keynesian view of accumulation, which has been developed in Cambridge in the 1950s, according to which higher propensities to save generate lower rates of accumulation. In these models, developed in particular by Joan Robinson, the Cambridge equation is only one half of the story. It must be combined with an investment function, where accumulation depends on the expected rate of profit and various other factors, such as the optimism of entrepreneurs or the availability of credit. The introduction of this investment function has a substantial impact on the interpretation of the Cambridge equation. In the post-Keynesian model of Joan Robinson, both the rate of accumulation and the realized rate of profit become endogenous, and it is no longer possible to assert that a higher propensity to save is conducive to a higher rate of accumulation. In fact, quite the contrary occurs: a higher propensity to save generates a lower rate of accumulation. This was the dynamic equivalent of Keynes's paradox of thrift, whereby a higher propensity to save generates a lower income level in a static framework, and it generalized the role of effective demand to growth economics and the long run. To this generalization, both the Sraffians and the post-Keynesians adhered.

Despite this agreement on the role played by effective demand, the interpretation of the Cambridge equation generated a controversy between Sraffians and post-Keynesians. The latter came to interpret the rate of profit determined by the Cambridge equation as the normal rate of profit, consistent with the normal utilization of capacity. Thus, in the old Cambridge model of growth, a higher rate of accumulation came to be associated with a higher normal rate of profit, and hence, disregarding changes in saving rates or technical progress, with higher profit margins and lower real wages. This did not fit well with the Sraffian view, according to which the normal rate of profit is determined by the power struggle over real wages or by interest rates set by the central bank. Initially, most Sraffians, along with many Marxists and Cambridge authors, such as Joan Robinson, associated the long period with *fully adjusted positions* only, i.e. positions that correspond to the normal use of capacity or normal output, with a uniform rate of profit (Vianello, 1985). Most Sraffians now have explicitly abandoned at least part of this claim. The present Sraffian view is that, even in the long period, the realized utilization rate will generally be different from its normal level. The rate of capacity utilization is thus flexible, in the short run as well as in the long run, and this flexibility allows savings to adjust to a higher rate of investment, as the post-Keynesians would have it, but without profit margins having to rise or real wages to fall. This rejection of a necessary link between higher growth rates and higher profit margins, as can be found in Garegnani (1992), constitutes the main Sraffian critique of the old Cambridge model of growth, which until recently constituted the dominant post-Keynesian view of output and distribution.

It should be noted that the very same critique against the old Cambridge model of growth had been addressed by Davidson (1972, pp. 123–127) in his overview of post-Keynesian economics. Davidson noted some inconsistency among Cambridge authors: on one hand, they underlined the importance of effective demand and quantity adjustments, but on the other hand their growth models relied on the flexibility of the price mechanism. Both Kaldor (1964, pp. xvi–xvii) and Robinson (1969, pp. 261–262), however, had themselves recognized the deficiencies of their models in that regard, noting that actual profit rates could be modified through changes in the rate of utilization, without modifying profit margins. As argued by Kurz (1994), the endogenous view of the actual degree of utilization is also fully compatible with the growth models constructed by post-Keynesians in the Kaleckian tradition (Rowthorn, 1981; Amadeo, 1986; Dutt, 1990; Lavoie, 1995), and it extends Keynesian income effects beyond the short-run, where they had been contained until then. Thus, Sraffians agree that there is no reason for the actual rate of capacity utilization to equal its normal rate.[1]

Notwithstanding these large segments of agreement among post-Keynesians and Sraffians, there remain two sources of contention. First, several authors, be they Sraffians or Marxists, have claimed that long-run models where the rate of utilization is not equal to its normal value, lack logical consistency. For these authors, only fully adjusted positions are logically consistent in a long-run analysis, i.e. only equilibria where the realized and the normal rates of profit are equal, and where the realized and the normal rates of capacity utilization equal each other. Only these equilibria are *final*, because otherwise there would exist economic forces that would change the long-run equilibrium. One response to this critique has been to redefine the long run, as do Chick & Caserta (1996), calling medium-run models, or provisional equilibria, those models that achieve an equilibrium rate of growth without the actual and the normal

[1] A similar convergence of views can be observed in the case of some Marxists. For instance, as late as the early 1980s, Marglin (1984) was still assuming a fixed rate of capacity utilization in long-run analysis, while the degree of utilization becomes an endogenous variable in Bhaduri & Marglin (1990).

utilization rates being equal. The other response has been to study the mechanisms that could lead these two rates to become equal, and to analyse the consequences of these mechanisms on the theory of effective demand. But even if this problem is set aside, a second source of contention arises. According to most Kaleckians, there is no reason to expect actual prices to equal normal prices, i.e. those prices computed with normal rates of profit on the basis of normal rates of capacity utilization. For Sraffians, on the contrary, such normal prices must prevail in the long period. As Ciccone (1986, p. 24) puts it, 'the tendency towards long-period prices does not in fact seem to require the simultaneous gravitation of the effective utilization of capacity around its normal level—i.e. the level of utilization implicit in those prices'. For these Sraffians, the tendency towards normal prices does not entail a tendency for actual rates of capacity utilization to equal normal rates of capacity utilization. Another way to put it is to say that the convergence towards normal prices occurs much faster than the convergence towards normal rates of capacity utilization. My intent in the following sections is to study these two sources of contention.

The paper proceeds as follows. In the next section we present the essentials of a Kaleckian model of growth with target return pricing. In the third and fourth sections, two different adjustment mechanisms are proposed to bring the economy back to a fully adjusted position. In the fifth section we introduce a conflict-based theory of inflation. In the sixth section, it is shown that an adjustment process that takes into account the bargaining power of workers does not bring back the economy to a fully adjusted position, i.e. despite target rates of return and realized rates of return being equated, actual rates of capacity utilization do not converge towards normal rates. The last model will thus yield some ground to all views: actual prices in the long-run equilibrium are not normal prices, and actual utilization rates are not normal rates, but because the realized rates of return turn out to be equal to the target rate of return, dynamic forces are such that this equilibrium is a terminal point.

2. The Basic Model

2.1. The Profits Cost Equation

There are two crucial equations in the Kaleckian model of growth and distribution: one identifies the rate of profit from the supply side, the other from the demand side. We start out with the derivation of what Rowthorn (1981, p. 8) and Steindl (1979, p. 3) call the profits function, which we shall call the profits cost equation. From national accounting, we have that the value of net aggregate output is equal to the sum of the wage costs and the profits on capital:

$$pq = wL + rpK$$

where p is the price level, q is the level of real output, w is the nominal wage rate, L is the level of labour employment, r is the rate of profit, K is the stock of capital in real terms. Thus,

$$p = w(L/q) + rpK/q \qquad (1)$$

We then make the following three definitions:

$$l = L/q$$
$$u = q/q_{fc}$$
$$v = K/q_{fc}$$

The first equation shows labour per unit of output, assuming away, as is often done, overhead labour. The second equation defines the rate of utilization of capacity, with q_{fc} denoting full capacity output. The third equation defines the capital-to-capacity ratio, which is assumed to depend on technology. With these definitions, equation (1) can be rewritten as:

$$p = wl + rpv/u \quad (2)$$

Equation (2) gives us the price of a unit of output in terms of the labour costs per unit of output and the profits per unit of output. From this equation, we obtain the rate of profit in terms of the real wage rate:

$$r = (u/v)[1 - (w/p)l] \quad (3)$$

The *realized* rate of profit here thus depends on the exogenous real wage rate and the degree of capacity utilization. At this stage, we have to introduce a pricing equation. Kaleckians themselves seem to have favoured mark-up pricing of the type:

$$p = (1 + \theta)wl$$

One is not forced to adopt this type of cost-plus pricing procedure. Indeed, it has been argued by Lee (1994) that pricing procedures are, to a large extent, dependent on accounting procedures, and that the latter have long been sophisticated enough to support normal cost pricing procedures, sometimes called full-cost pricing. Such pricing is based on unit costs, or more specifically standard unit costs, rather than unit direct costs only. A particular specification of normal cost pricing is target return pricing, and this seems to have been prevalent for some time, both among large and smaller firms (Lanzillotti 1958; Shipley 1981). There are obvious tight links between Sraffian versions of normal prices and the administered cost-plus prices, to be found in many empirical studies and which are endorsed by most Kaleckians. This is most obvious in Lanzillotti's version of normal cost pricing, which is based on target-return pricing. Prices are set according to the normal unit costs of the price leaders, assessed at some *standard* volume of production, on the basis of a *target rate of return*. There is no presumption that this target rate of return will be the realized rate of profit: the former will be achieved only if actual sales are equivalent to the standard volume of output. Some Sraffians give a similar interpretation of prices of production: they may be defined on the basis of a stable system of profit rate differentials; they are based neither on the best available nor the average technique, but rather on the dominant technique—that of the price leaders; they are based on the normal degree of utilization of the existing productive capacity rather than on actual output levels (Roncaglia 1990).

We can find an explicit pricing formula for target return procedures that is almost as simple as the mark-up equation. What then would the mark-up proxy θ be equal to? Suppose that the replacement value of the stock of capital is pK, while the target rate of return, which we might want to call the *normal* or the *standard* rate of profit, is r_s. Required profits for the period are then $r_s pK$. With a normal (or standard) rate of capacity utilization of u_s, corresponding in the period to a level of output of q_s, the required profits for the period must be equal to $r_s vpq_s/u_s$. This must be equated to the total profits that are to be obtained by marking up unit costs at the standard rate of utilization of capacity: θwl. After some manipulation, a simple pricing formula for target pricing procedures can be found:[2]

$$p = (u_s/(u_s - r_s v))wl$$

Of course, the equation makes sense only if the denominator is positive, that is if: $u_s > r_s v$. The inequality must, by necessity, be fulfilled since it implies that wages are positive, i.e. profit income is smaller than total income. When this target return pricing formula is combined with Equation (3), we obtain the rate of profit seen from the cost side, i.e. the profits cost function:

$$r^{PC} = r_s(u/u_s) \qquad (5)$$

One should note that if the actual rate of capacity utilization u turns out to be equal to the standard rate of utilization of capacity u_s, the actual rate of profit r is then equal to the target rate of return r_s embodied in the margin of profit of the pricing procedure. Since Equation (5) is linear in u, it clearly shows that the standard and the actual rates of profit cannot be equal unless the standard and the actual rates of capacity utilization are equal. This result will be useful when the target rate of return is endogenized later on.

2.2. The Effective Demand Side

The previous equations define a rate of profit seen from the cost accounting side. The rate of profit that will be realized depends on the actual rate of capacity utilization. Effective demand, which has not yet been taken into account, will help determine the rate of capacity utilization. In the simplest neo-Keynesian models, as in the presentation of Ciccone (1986), the rate of accumulation is taken to be exogenous. The impact of effective demand in the Cambridge equation is felt on the realized rate of profit, which is the endogenous variable. A crucial feature of the Kaleckian model is its investment function. The Cambridge equation must thus be reinterpreted as a savings function. With the standard assumptions, i.e. there are no savings out of wages, the savings function in growth terms becomes:

$$g^s = rs_p$$

with s_p the overall propensity to save out of profits.

We now come to the investment function, which has been the main subject

[2] A similar but more complicated formula could be derived in a two-sector case, as is done in Lavoie & Ramirez-Gaston (1997).

of contention. Let us use a version of it that has often been used by Kaleckian authors. The rate of accumulation set by firms depends on the rate of capacity utilization and on the realized rate of profit:

$$g^i = \gamma + \gamma_u u + \gamma_r r$$

where γ is some parameter that must be positive in models without overhead labour (Dutt 1990, p. 25), while γ_u and γ_r are positive reaction parameters.

Putting together the above two equations, one obtains what Rowthorn (1981, p. 12) calls the realization curve. To avoid confusion, and to emphasize the role of effective demand, we shall call it the effective demand equation:

$$r^{ED} = (\gamma_u u + \gamma)/(s_p - \gamma_r r) \tag{6}$$

The steady-state solution to this Kaleckian model of growth and distribution can be obtained by combining the profits cost equation (5) and the effective demand equation (6). Doing so yields:

$$\begin{aligned} u^* &= \gamma u_s/[r_s(s_p - \gamma_r) - \gamma_u u_s] \\ r^* &= \gamma r_s/[r_s(s_p - \gamma_r) - \gamma_u u_s] \end{aligned} \tag{7}$$

These solutions are positive and the model is stable provided:

$$s_p > \gamma_r + \gamma_u u_s/r_s$$

3. A Fully-adjusted Position with an Endogenous Normal Rate of Profit

As is well known, the basic Kaleckian growth model contains two features. First, Keynes's paradox of thrift holds, even in the long run (an increase in the propensity to save decreases u^* and r^*, and hence the rate of accumulation). Secondly, there is the paradox of cost: any increase in costs raises the realized rate of profit (Rowthorn, 1981, p. 18). A higher target rate of return in the pricing formula, i.e. a lower real wage rate, is associated with a lower rate of utilization, a lower realized rate of profit, and hence a lower rate of accumulation. While Sraffian authors do not endorse the sort of investment function that gives rise to the paradox of costs, they nonetheless agree that the paradox of costs may occur under some circumstances.[3]

Another problem arises however, which is the main subject of the present paper, that of the discrepancy between the target rate of return and the realized rate of profit. While there is no objection to these two rates being different in the short run, several authors believe that a discrepancy between the two rates contradicts the notion of a long-run equilibrium—a final equilibrium where there should exist no inducement to modify the values taken by the main variables. Sraffian authors such as Vianello (1985), Committeri (1986) or Park (1997a), and Marxist authors such as Duménil & Lévy (1994) or Auerbach & Skott

[3] Sraffian (and Marxist) authors, as is explicit in Kurz (1991, 1994), generally endorse an investment function of the type: $g^i = \gamma + \gamma_u u + \gamma_r r_s$. The paradox of costs will only arise under some parameter constellations.

(1988), insist that, in the long run, targets should be achieved. The steady-state solutions of the Kaleckian growth model, as in Equation (7), may thus be taken to be a provisional equilibrium. How then could we arrive at the final equilibrium? And would this final equilibrium be a fully adjusted position?

A possible mechanism to arrive at a final long run position would have the normal rate of profit (or more precisely here, the target rate of return) itself being influenced by the actual rate of profit. Whenever the rate of profit exceeds the target rate of return, firms react by (slowly) increasing the target rate of return and the margin of profit. A straightforward representation of this intuition yields the following time derivative:

$$\dot{r}_s = \phi\,(r^* - r_2) \tag{8}$$

Will the operation of Equation (8) ensure convergence between the actual rate of profit and the target rate of return? When the actual rate of profit is higher than the target rate of return, the latter is set at a higher value. The profit margin is thus increased. The higher profit margin (the lower real wage) slows down effective demand, thus reducing the rate of utilization and the realized rate of profit, despite the higher target rate of return. This process will continue until the target rate of return is such that it generates an actual rate of profit, which is equal to the target. More formally, this can be seen by taking the derivative of the equilibrium rate of profit, given by equation (7), with respect to the target rate of return:

$$\mathrm{d}r^*/\mathrm{d}r_s - \gamma\gamma_u u_s/D^2 < 0$$

where D is the denominator of Equation (7).

This process, however, will also bring together the realized rate of capacity utilization and the standard rate of utilization. The actual rate of utilization in the fully adjusted position thus becomes a predetermined variable, equal to the given conventional standard rate u_s. As a result, the paradox of costs disappears. An increase in the rate of growth is associated with a decrease in the real wage rate (and an increase in the standard rate of return).

On the other hand, the paradox of thrift is sustained even in this fully adjusted position. An increase in the propensity to save has a negative impact, from one fully adjusted position to the next, on the rate of accumulation. This can be seen by putting together Equations (5) and (6), which define the profits cost function and the effective demand function. In the fully adjusted position, the realized rate of capacity utilization is always equal to its standard level, so that $u^* = u_s$. When solving for the very long run, when all adjustments corresponding to Equation (8) have been exhausted, it is the target rate of return r_s that becomes the endogenous variable. Solving for this variable, and making use of the Cambridge equation, we obtain:[4]

$$r_{s^{**}} = (\gamma_u u_s + \gamma)/(s_p - \gamma_r)$$
$$g^{**} = (\gamma_u u_s + \gamma)/[1 - (\gamma_r/s_p)]$$

[4] It should be noted however that, with a simplified investment function of the sort $g^i = \gamma + \gamma_u u$, changes in the propensity to save would have no impact on the fully-adjusted rate of accumulation.

An increase in the propensity to save s_p yields a fully adjusted position with a lower rate of accumulation. The paradox of thrift thus appears to be quite resilient. Indeed, the results that are achieved with the addition of the adjustment process described by Equation (8) are akin to those that were defended by post-Keynesians such as Joan Robinson with the help of the old Cambridge model (Lavoie 1992, p. 357). If an adjustment mechanism equates the actual rate of profit and the target rate of return, normal prices eventually prevail, and despite the presence of short-period Kaleckian features, the economy is ultimately back to a fully adjusted position, at normal rates of capacity utilization. Now, this was precisely the basis of the old Cambridge growth model, where the paradox of thrift also held up. This was also the basis of the modern oligopolistic version of the old Cambridge model, as can be found in the Eichner-Wood model, and as it has been recently proposed again by Nell (1996, p. 396). Finally, it can be said that the present adjustment mechanism also solves a problem that was mentioned by some Sraffians: if Sraffa's pricing equations are implicitly based on fully adjusted positions, how can these positions ever be reached? The mechanism of Equation (8), with the rest of the Kaleckian model, provides the route towards fully adjusted positions that Vianello (1985) and Committeri (1986) were looking for, at least within a one-sector model.

4. An Alternative Process towards Fully Adjusted Positions

Duménil & Lévy (1999) have recently suggested alternative means to achieve a fully adjusted position: they suppose that demand inflation is generated as long as realized rates of capacity utilization exceed the standard rate, and hence that, in an attempt to fight off inflation, monetary authorities raise real interest rates as long as this divergence persists. This can be formalized as:

$$\mathrm{d}i/\mathrm{d}t = \zeta\ (u^* - u_s)$$

where i is the real interest rate, and ζ is a positive reaction parameter.

Assuming an investment function, the arguments of which are the rate of utilization and the realized rate of profit, net of the real interest cost:

$$g^i = \gamma + \gamma_u u + \gamma_r (r - i)$$

it follows that the economy will always be brought back to a position with a constant real interest rate, where the actual rate of capacity utilization is equal to its standard rate (the adjustment will proceed as long as $u^{\square}\ \square u_s$).

For instance, if effective demand and pricing conditions, given by ED_1 and PC_1, are such that the actual rate of utilization u_1 exceeds the standard rate u_s, as is the case in Fig. 1, the behaviour of the monetary authorities will drive down the effective demand curve to ED_0, where the actual and the standard rates of capacity utilization are equated, that is until the actual rate of profit is brought back to the target rate of return r_{s1}^{**}.

Within the framework presented by Duménil & Lévy, real interest rates do behave in line with the loanable funds theory across fully adjusted positions.

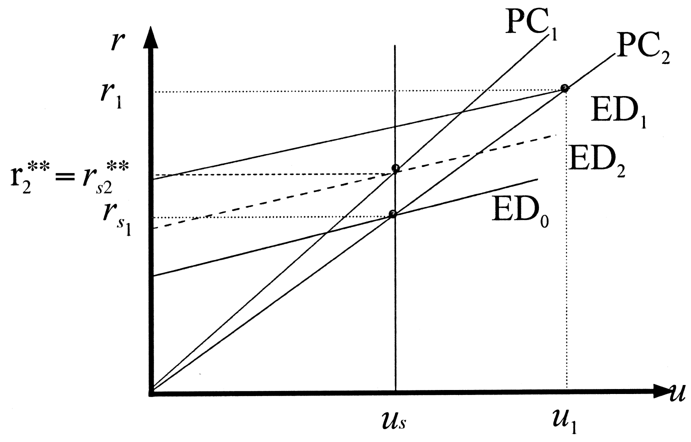

Fig. 1.

Evaluated at the fully adjusted position (where $u^* = u_s$), the savings and the investment functions are:

$$g^s = r_s s_p$$
$$g^i = \gamma + \gamma_u u_s + \gamma_r (r_s - i)$$

By equating the above two equations ($g^i = g^s$), we can derive the value of the fully adjusted real rate of interest:

$$i^{**} = [\gamma + \gamma_u u_s - (s_p - \gamma_r) r_s] / \gamma_r$$

It is then obvious that a higher propensity to save, or a higher normal profit rate, is associated with a lower real rate of interest when fully adjusted positions are reached. The Duménil & Lévy model generates truly classical supply-led features across long-run positions. Higher savings rates allow for faster growth and lower real rates of interest when long run equilibria are taken into account. Within such a framework, both the paradox of costs and the paradox of thrift disappear. Although the economy behaves along Keynesian or Kaleckian lines in the short period, i.e. although the model is demand-led in the short-run, the long-run behaviour of the model is consistent with the classical model of accumulation. A low propensity to save is eventually conducive to a low rate of accumulation, and low rates of accumulation are associated with low normal rates of profit and high real wages. This has led Duménil & Lévy (1995, pp. 136–137) to argue that ‘while it is possible to be Keynesian in the short term, one is required to be classical in the long term’.

Could the paradox of thrift be salvaged by adding to the above equations an additional relation linking the target rate of return to the rate of interest? Following a remark made by Sraffa, it has been suggested by a number of Sraffians that the normal rate of profit is mainly determined by the rate of interest set by the monetary authorities (Panico, 1985; Pivetti, 1985; Vianello, 1985, p. 84). In particular, Pivetti (1991, p. 122) has explicitly linked full-cost pricing and target-return pricing to the trend level of the rate of interest. For Pivetti, the costing margins that firms consider normal or appropriate are calculated to yield a fair rate of return on investment. This fair rate of return—the target rate of return or the normal rate of profit—itself depends on the rate of interest that can be obtained on riskless placements. In its simplest form, as suggested by Pivetti (1985, p. 87), we have:

$$r_s = i + r_{npe}$$

where r_{npe} is the net profit rate of entrepreneurs, or the profit rate of entrepreneurs net of interest (opportunity) costs, which is here assumed to be given.

This net profit rate of entrepreneurs is not the net rate of return that entrepreneurs actually manage to get; rather, r_{npe} is the net rate of return that entrepreneurs add to the interest opportunity cost when setting gross costing margins and prices. The *realized* net profit rate of entrepreneurs, just like the realized profit rate, depends on the realized rate of capacity utilization. Of course, more sophisticated relations between the target rate of return and the lasting rate of interest could be put forward, relations that would not necessarily keep the net profit of entrepreneurs at a constant level, but for our purposes the simple relation as presented above will suffice.[5]

Putting together this Sraffian relation and the Duménil & Lévy mechanism where any increase in effective demand would still bring back the economy to a fully adjusted position, a lower rate of savings, comparing fully adjusted positions, would now entail a higher realized rate of profit and a higher target rate of return. This result is illustrated in Fig. 1. Assume we start out from a fully adjusted position, given by the intersection of the ED_0 and PC_1 curves, at the standard rate of utilization u_s and the normal rate of profit $r_{s1^{**}}$. A lower propensity to save or higher animal spirits would initially push the effective demand curve from ED_0 to ED_1. The new realized rate of utilization u_1 would induce the monetary authorities to increase real rates of interest. These higher interest rates would lead entrepreneurs to augment target rates of return, thus inducing a rotation to the left of the profits cost curve from PC_1 to PC_2. This, combined with the negative effects of higher interest rates on investment and effective demand, as revealed by the drop in the effective demand curve from ED_1 to ED_2, would finally bring the economy to a new, fully adjusted, position, at the standard degree of utilization u_s, where the realized rate of profit and the target rate of return would equal r_{s2}^{**}.

The target rate of return, in the long run, has again become an endogenous variable, while the long-run realized rate of capacity utilization must be equal to its standard value ($u^{**} = u_s^{**}$). Mathematically, the fully-adjusted target rate of return, seen from the demand and the supply side respectively, must be such that:

$$r_s;^{**} = (\gamma + \gamma_u u_s - \gamma_r i^{**})/(s_p - \gamma_r)$$
$$r_s^{**} = i^{**} + r_{npe}$$

[5] This is the main critique addressed against Pivetti's framework (see Mongiovi, 1996, among others). There is also a very interesting critique by Serrano (1993), about how one can define a real rate of interest–as opposed to a nominal rate of interest–independently of changes in relative prices. Finally, there is the critique of Nell (1999) who argues that there cannot be such a thing as a normal rate of interest.

where i^{**} is the endogenous fully adjusted real rate of interest. Solving for the fully adjusted rate of interest and for the fully adjusted rate of accumulation, we get:

$$i^{**} = [\gamma + \gamma_u u_s - (s_p - \gamma_r) r_{npe}]/s_p$$
$$g^{**} = \gamma + \gamma_u u_s + \gamma_r r_{npe}$$

The fully adjusted rate of accumulation depends ultimately on the optimism of entrepreneurs (as reflected in the various γ parameters) and on the value taken by the net profit of entrepreneurs, as assessed by the entrepreneurs. The paradox of thrift is not recovered, even with this Sraffian version of the Duménil & Lévy mechanism. A decrease in the propensity to save leads to a temporary increase in the rate of utilization and the rate of accumulation. These higher rates however generate an increase in the real rate of interest set by the central bank. Interest rates (and target rates of return) continue to rise until the actual rate of utilization is brought back to its normal value, at which point the actual rate of profit is also equal to its normal value. This implies that the difference between the new fully adjusted profit rate r_{s2}^{**} and the old fully adjusted profit rate r_{s1}^{**} is exactly equal to the difference between the new and the old fully adjusted real rates of interest. Thus, when comparing fully adjusted positions, once all adjustments have been completed, it must be concluded from the above solutions that a decrease in the propensity to save does not lead to any change in the rate of accumulation.

On the other hand, an increase in the animal spirits of entrepreneurs (a rise in the parameter γ) will generate an increase in the fully adjusted rate of capital accumulation. This, however, will be accompanied by an increase in the fully adjusted real rate of interest and in the fully adjusted rates of profit—the realized rate of profit and the target rate of return being equated. In this case, there is some reconciliation between the Sraffian approach and the views that have been expressed by some post-Keynesians (Nell, 1988; Wray, 1991). For the latter, in the long run, higher rates of accumulation must induce higher realized rates of profit and hence higher interest rates and higher normal rates of profit. For the former, higher rates of interest cause higher normal rates of profit. The two views appear to be vindicated here: a higher propensity to accumulate γ generates faster accumulation, higher real rates of interest, higher normal profit rates, and higher realized profit rates.

Are there other means to recover the paradox of thrift and the paradox of costs? It would be possible to argue that the standard rate of utilization also responds to actual values (Lavoie, 1996; Dutt, 1997; Park, 1997b). This line of research, which generates a multiplicity of solutions, many of which retain their Kaleckian properties, will not be pursued here. We shall instead track a new avenue, based on the addition of a conflict-based model of inflation. This will allow us, within a fully determined model, to retain the flexibility of the rate of capacity utilization and the positive relation between the real wage rate and the rate of accumulation (in some cases), while assuming the equality between the realized and the normal rates of profit.

5. A Model of Conflict Inflation

We now present a model of inflation that does not rely on excess demand. The model is based on the inconsistent income claims of firms and workers, that is, based on what has been called *real wage resistance* by some and an *aspiration gap* by others. In standard terminology, the focus of the analysis is on the wage–price spiral. As a first approximation, wage–wage inflation and other income conflicts will be omitted, as will be feedback effects from the real economy.[6] This will allow us to understand the essentials of the model of conflict inflation and to integrate it to target return pricing.

The model may be called Kaleckian because it has some affinity with Kalecki's last article, entitled 'Class struggle and distribution of national income' (Kalecki, 1971, ch. 14). Whereas before, Kalecki took the degree of monopoly to be an exogenous variable, he argues in this article that trade unions have the power to achieve reductions in the mark-up, by demanding and achieving large increases in money wage rates. This view has been summarized by Rowthorn (1977, p. 179) in the following: 'The working class can shift distribution in its favour by fighting more vigorously for higher wages, although the cost of such militancy is a faster rate of inflation, as capitalists try, with only partial success, to protect themselves by raising prices'. This reflects the notion that social forces, such as the bargaining position of workers, help to determine income distribution.

Several post-Keynesian, neo-Marxian, and even mainstream authors have constructed models of conflict inflation, as first presented by Rowthorn (1977). In all these models, the rate of inflation is a function of the degree of inconsistency between the mark-up that firms wish to target and the real wage rate that the leading key labour bargaining units consider to be fair. As is clear from the mark-up pricing equation, $p = (1 + \theta)wl$, a target set in terms of real wages can always be made equivalent to a target set in terms of a mark-up. With target return pricing procedures, this target corresponds precisely to a target rate of return. Provided there is no change in productivity, it is thus indifferent to assume that both firms and workers set real wage targets, or that they both set mark-up targets. Here we shall set the equations in terms of the target rate of return.

The basic model of conflict inflation is based on two equations (see for example Dutt, 1990, p. 83). It is assumed first that the rate of growth of money wages that labour unions manage to negotiate is a function of the discrepancy between their real wage target and the actual real wage rate. In terms of target rates of return, this means that the target real wage rate of workers is equivalent to a target rate of return r_{sw}. It is the discrepancy between a high actual target rate of return and a low desired target rate of return, seen from the workers' point of view, that drives up wage demands. It is also assumed that the rate of

[6] One could introduce a feedback relationship between the rate of growth of the economy and the claims of workers or those of the firms, with little modification to the results to be shown (Lavoie 1992, ch. 7). One could also introduce a relationship between the claims of workers and the rate of unemployment, a sort of Phillips curve, in which case the model would become much more complex (see Skott, 1989, and Dutt, 1994). Also, see Cassetti (2002)

growth of money wages depends on the expected rate of price inflation $\hat{p}^e$. In its simplest form, the above two ideas can be expressed as:

$$\hat{w} = \Omega_1 (r_s - r_{sw}) + \Omega_2 \hat{p}^e$$

Similarly, it may be assumed that firms increase prices when the actual mark-up is below the mark-up that they would ideally desire to set, and that the larger the differential between those two mark-ups the higher the rate of price inflation. This may be formalized in terms of target rates of return, which for the firm we may denote as r_{sf}. The target rate of return, as *assessed* by firms may be different from the actual target rate of return *incorporated* into prices. When firms aim at higher mark-ups, given the actual mark-up, they would speed up the rate of price inflation, being constrained however by their bargaining power on both the labour and the product markets. Assuming that firms may have to list prices before wage increases have been settled and taking into account expected wage inflation, we have:

$$\hat{p} = \Psi_1 (r_{sf} - r_s) + \Psi_2 \hat{w}^e$$

We are now able to give an explanation of why the target rate of return may fully adjust to the actual rate of profit, without the rate of utilization of capacity becoming exogenous. To do this, it has to be recognized that firms are not in a position to set the exact mark-up of their choice. One must thus distinguish between two sorts of gross costing margins: the actual costing margin, which arises from the bargaining process; and the desired costing margin, which corresponds to the target rate of return and the standard rate of capacity utilization that firms would like to incorporate into their pricing strategy. In terms of wage rates, one would have to distinguish between two wage rates: the actual real wage rate arising from bargaining; and the real wage rate targeted by firms, corresponding to the standard rate of profit r_{sf} *assessed* by firms.

We may consider that there is a steady-state in a model without technical progress when the actual real wage rate is a constant; that is, when the actual and the expected rates of wage inflation are equal to the actual and expected rates of price inflation (again, technical progress is omitted for simplification). In such an equilibrium, that is with $\hat{w}$ and $\hat{p}$ equal to each other, the profit margin is a constant, and equating the two equations describing wage and price inflation, we get:

$$\hat{p} = \frac{\Omega_1 (r_s - r_{sw})}{1 - \Omega_2} = \frac{\Psi_1 (r_{sf} - r_s)}{1 - \Psi_2}$$

By solving the above equation for the target rate of return actually incorporated into prices, namely r_s, the distinction between the above concept and the target rate of return r_{sf} assessed by firms should become clearer. There is a simple relation between the two concepts: the actual target rate of return r_s is a weighted average of both the target rate of return assessed by firms and the target rate of return assessed by workers, where the sum of the weights (Ω and Ψ) is equal to one, and such that:

$$r_s = \Psi r_{sf} + \Omega r_{sw} \tag{9}$$

where:

$$\Omega = \frac{\Omega_1\,(1-\Psi_2)}{\Omega_1\,(1-\Psi_2)+\Psi_1\,(1-\Omega_2)}$$

$$\Psi = \frac{\Psi_1\,(1-\Omega_2)}{\Omega_1\,(1-\Psi_2)+\Psi_1\,(1-\Omega_2)}$$

This new model is exactly like the model first presented in Section 2, where no complications related to inflation had been introduced. In Equations (4) and (5), we may now introduce the value of the actual target rate of return as given by the weighted average of Equation (9). Combining Equations (7) and (9), one obtains:

$$r^* = \frac{\gamma\,(\Psi r_{sf} + \Omega r_{sw})}{(s_p-\gamma_r)\,(\Psi r_{sf}+\Omega r_{sw})-\gamma_u\,u_s} \tag{10}$$

An increase in the target rate of return as assessed by firms, r_{sf}, will lead to an increase in the target rate of return incorporated into prices, r_s, and hence, as shown in Section 3, to a fall in the realized rate of profit r^*, i.e.

$$\mathrm{d}r^*/\mathrm{d}r_{sf} < 0 \tag{11}$$

6. Conflict Inflation with an Endogenous Target Rate of Return

Let us now endogenize the target rate of return as assessed by firms. This means that higher realized rates of profit will modify what the firms consider to be the normal rate of profit. Let us assume, then, that firms slowly adjust their assessed target rate of return (r_{sf}) according to the actual rate of profit (r), in symmetry to Equation (8) above. More precisely, as suggested in Lavoie (1992, p. 418), Equation (8) must now be written as:

$$\dot{r}_{sf} = \phi\,(r^* - r_{sf}) \tag{12}$$

In Section 3, it was argued that a long-run equilibrium is reached when the target rate of return r_s is the same in two successive periods, that is when the target rate of return and the actual rate of profit are equal, as driven by the process of Equation (8). Here, in a world where trade unions have some bargaining power, the process of adjustment involves, instead, the target rate of return r_{sf} assessed by firms, and Equation (12). In general, the process described by Equation (12) will thus come to an end without the fully adjusted rate of return being actually incorporated in prices. This means that the rate of capacity utilization emerging from the adjustment process is not necessarily the standard rate of utilization, and that, as a consequence, the rate of capacity utilization is endogenous despite the existence of this adjustment process. The long-run equilibrium is not, in general, a fully adjusted position.

The final equilibrium of such an economy with evolving bargaining power will thus require the additional equation, $r^* = r_{sf}$. Unfortunately, adding this condition in Equations (7) and (10) yields a quadratic equation. It is thus easier to assess the adjustment process from a graphical point of view. We can first

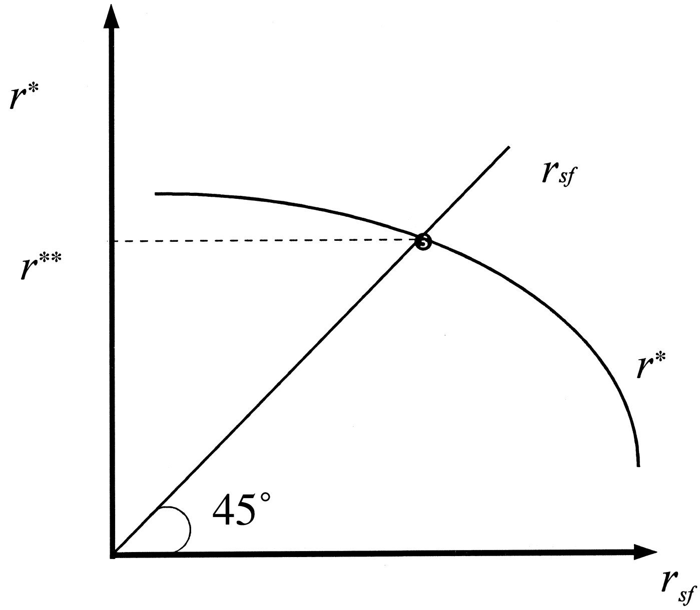

Fig. 2.

look at this adjustment process by considering the rate of profit only. This is done in Fig. 2. The r^* curve represents the negative link between the target rate of return assessed by firms, r_{sf} and the actual rate of profit that arises from effective demand considerations. For instance, when the actual rate of profit is above the target rate of return as assessed by firms, firms react by raising what they perceive to be the normal target rate of return. This, as shown by Equation (11), leads to a decrease of the realized rate of profit. There is thus a convergence process between the two rates, achieved at r^*. This is the long-run rate of profit.[7]

The adjustment process is more completely represented in Fig. 3. Let us start from a situation in which the real wage rates desired by firms and by workers coincide, as shown on the left-hand side of the graph, where the $\hat{w}$ and $\hat{p}$ curves intersect on the vertical axis (so that $\hat{p} = 0$). This implies that the target rate of return initially assessed by firms, called r_{sf1}, and the target rate of return embodied in the pricing formula, called r_{s1}, are equal. We have the triple equality: $r_{sw} = r_{sf1} = r_{s1}$. We can draw the profits cost curve corresponding to this situation, which is shown on the right-hand side of the graph as PC(r_{s1}). We can suppose that the initial conditions, from the effective demand point of view, were such that the target rate of return incorporated into prices was being realized at the standard rate of capacity utilization u_s, i.e. $r_{s1} = r_1^{**}$ (as shown by the curve ED_1). Suppose now that there is a sudden increase in demand, as shown by the shift of the ED curve from ED_1 to ED_2. Under the new demand

[7] As can be seen, given the necessary negative relationship between the target rate of return and the actual rate of profit, there can only be one economically relevant long-run equilibrium; the other solution would yield a negative rate of profit.

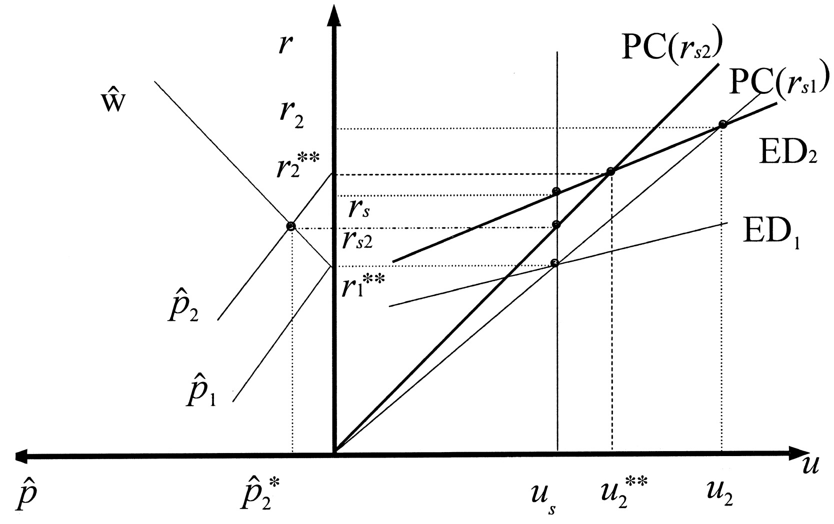

Fig. 2.

conditions, the actual rate of capacity utilization is u_2, and the actual rate of profit is r_2. The actual rate of profit r_2 is thus much higher than the target rate of return $r_{sf1} = r_1^{**}$. As a result, firms will slowly revise upwards their assessed target rate of return r_{sf}, along the lines of Equation (12), as is illustrated in Fig. 2.

Three phenomena will now arise. First, as firms revise their estimate of what the target rate of return is, a discrepancy arises between the real wage rate targeted by firms and the real wage rate targeted by workers. This will induce wage and price inflation, along the lines of our conflictual inflation model, while the actual real wage rate becomes different from the real wage targeted by firms. Secondly, a similar wedge arises between the target rate of return assessed by firms and the target rate of return incorporated into prices. Thirdly, as real wages diminish, the actual rate of profit falls. There is thus a convergence between the realized rate of profit, which falls, and the target rate of return assessed by firms, which rises.

The end result of this convergence process is shown in Fig. 3. Firms are assessing a target rate of return of r_{sf2}. Because of the bargaining power of labour, inflation occurs at a rate of $\hat{p}_2$.[8] The new profits cost curve PC(r_{s2}) is such that the actual rate of profit, r_2^{**}, and the target rate of return assessed by firms, r_{sf2}, are equated. The adjustment process of the target rate of return has led to a new rate of capacity utilization u_2^{**}, which is different from the standard rate of utilization, u_s. The rate of capacity utilization in the long-run position is thus still endogenous, despite the presence of an adjustment mechanism.

The introduction of real wage resistance by workers thus yields a model where the equilibrium rate of capacity utilization is still endogenous, not being

[8] This rate of inflation is a steady state rate of inflation, and not just a transitory phenomenon.

forced back to its standard level of utilization, despite the adoption of a mechanism that brings together the target rate of return and the actual rate of profit. The key characteristic of the Kaleckian model, that is the endogeneity of the rate of capacity utilization, even in the long run, is thus preserved within a model with definite solutions. On the other hand, a key assertion among some Sraffians—that the rate of capacity utilization is endogenous in the long run, even when entrepreneurs equate the standard rate of return with the realized rate of profit—is also vindicated. Here, the realized rate of profit is equalized to the target rate of return assessed by entrepreneurs, although this assessed normal rate of profit is not exactly incorporated into prices, because of real wage resistance.

It should be noted, however, that the pure Sraffian or classical position is not vindicated in the present model.[9] Demand conditions being given in the long period, say by the curve ED_2, some authors would maintain that normal prices should be set according to the target rate of return noted r_s in Fig. 3, and that prices on this basis will be the centre of gravitation of market prices. In our model, assuming that firms initially did set prices on the basis of a target rate of return of r_{s1}, a target rate of return of r_s will eventually be assessed by firms. This target rate of return, however, is not a centre of gravitation. The target rate of return assessed by firms will continue to rise until it equates the actual rate of profit, that is until $r_{sf2} = r_2^{**}$. At that point, the target rate of return incorporated into prices, r_{s2}, will be lower than the target rate of return r_s that would correspond to the Sraffian normal prices.

One last issue must be dealt with. It has been argued in the introduction that most Kaleckians and Sraffians agree on the fact that lower real wages need not be associated with higher rates of accumulation in the long run, even without technical change. From the analysis portrayed in Fig. 3, it is clear that the higher fully adjusted rate of accumulation, induced by higher animal spirits or a lower propensity to save, has led to an increase in the profit margin and hence to a fall in the real wage rate. Thus, while the paradox of thrift has been recovered once again, one may therefore wonder whether the attempt to safeguard some features of the Kaleckian or Sraffian analysis has not led to the destruction of other key features. This is not the case however. Even with adjustment mechanisms of the type entertained in Equation (12), a rise in the rate of accumulation may be accompanied by increases in the real wage rate.

Such a case is illustrated in Fig. 4. Suppose again that we start from a fully adjusted position, where conditions are such that the actual rate of capacity utilization is equal to the standard rate of utilization and where the targets of workers and those of firms coincide. The rates of profit are then $r_1^{**} = r_{s1} = r_{sf1} = r_{sw1}$. The economy is at the intersection of the ED and $PC(r_{s1})$ curves, while on the left-hand side of the graph, the $\hat{w}_1$ and $\hat{p}_1$ curves intersect on the vertical axis. Now consider the case where workers are more militant and request a higher real wage rate, equivalent to a lower target rate of return, say r_{sw2}. For didactic purposes, suppose they initially manage to impose real wages

[9] Note that Boggio (1992, p. 287) comes to a similar conclusion within the context of a multi-sector model: with inconsistent claims between workers and firms, the vector of actual profit rates is not equated to the vector of target rates of return in the long run.

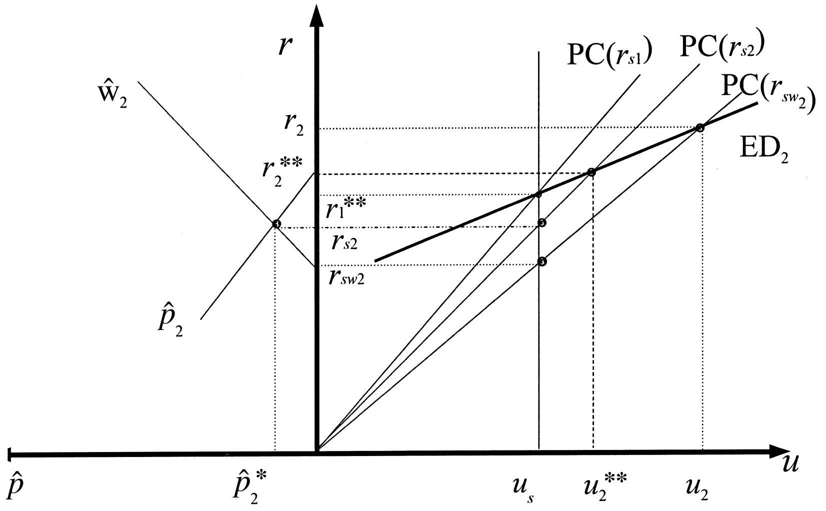

Fig. 4.

equivalent to this target rate of return r_{sw2}. This leads to a downswing rotation of the profits cost curve, from PC(r_{s1}) to PC(r_{sw2}). The higher real wages will induce a higher rate of capacity utilization (u_2), a higher rate of accumulation and higher realized rates of profit (r_2). This is the usual Kaleckian result. In the long run, however, the high realized rate of profit will induce entrepreneurs to increase what they consider to be the assessed target rate of return. In Fig. 4, this will be represented by an upward rotation of the PC curve, from PC(r_{sw2}) to PC(r_{s2}), until, finally, the falling realized rate of profit equates the increasing assessed target rate of return, such that in the end $r_{sf2} = r_2^*$. At that point, the new long-run rate of return incorporated into prices will be given by r_{s2}, with $r_{s2} < r_{s1}$. The new $\hat{w}_2$ and $\hat{p}_2$ curves cut each other at that r_{s2} rate of profit. The new long-run rate of utilization u_2^{**} is necessarily on the given ED curve, between the initial rate u_s and the provisional rate u_2. Thus, comparing long-run positions, where the assessed target rates of return and the realized rate of profit are equated, it follows that, in this case, a higher rate of capital accumulation is associated with a lower incorporated target rate of return, and hence with a higher real wage.[10] The Sraffian and the Kaleckian key belief, that higher rates of accumulation need not be associated with lower real wages, is thus confirmed, even across long-run positions.

7. Conclusions

In contrast to what was initially assumed both by Marxists and by neo-Keynesians à la Joan Robinson and Nicholas Kaldor, Sraffians and Kaleckians alike contend that higher rates of accumulation need not be associ-

[10] We would still get this result if we had started from a situation where the steady state rate of inflation was greater than zero.

ated with lower real wages, even without technical progress. Such a result was linked to the endogeneity of the rate of capacity utilization. This belief, however valid within the short-run context, has been questioned on the basis that it relies on discrepancies between standard and realized rates of capacity utilization or between normal and realized rates of profit, discrepancies that are judged to be unwarranted in long run analysis. Other solutions have been offered in the past to avoid this logical problem, such as the distinction between normal and average values (Park, 1997a, 1997b), as well as the possibility of endogenous normal rates of capacity utilization (Lavoie, 1996).

Two other solutions were first considered here. The first solution, where the normal profit rate is endogenous, responding to the values taken by the realized profit rate, has transformed the Kaleckian model into the old Cambridge growth model à la Joan Robinson. When the adjustment process has been completed, the long run equilibria are fully adjusted positions, running at their normal rates of capacity utilization, where higher rates of accumulation require lower real wages and higher normal profit rates. Still, these fully-adjusted positions exhibit some demand-led features, namely the paradox of thrift. The second solution is that offered by Duménil & Lévy (199). They assume that higher than normal utilization rates are conducive to price inflation, and that central banks respond to this inflation by pushing up real rates of interest. Investment and effective demand are eventually slowed, and this slowdown continues until rates of capacity utilization are brought back to their normal value. Duménil & Lévy thus manage to transform a short-run Kaleckian growth model, with demand-led features, into a long-run supply-led classical model of accumulation, where faster growth at fully adjusted positions requires higher savings rates and higher normal profit rates. The addition of the Sraffian hypothesis that normal rates of profit are largely determined by the real rate of interest set by the central bank only partially helps to recover some demand-led features.

The solution considered here in greatest detail is also based on the endogeneity of the value taken by the normal rate of profit. However, in addition, we considered the possibility of a divergence between the rates of return assessed and targeted by firms on the one hand, and the rate of return that is actually incorporated into prices on the other hand. This divergence arises because of the bargaining power of workers and their real wage resistance. There is convergence, however, between the realized rate of profit and the rate of profit targeted by firms. Under these conditions, the demand-led characteristics of the Kaleckian model are sustained, even in long-run equilibria. Such long-run equilibria are not fully adjusted positions where the equilibrium rate of capacity utilization would equal its normal value. The utilization rate remains an endogenous variable, even in long run equilibrium. The paradox of thrift remains valid in all cases, and the paradox of costs is retained in some cases, i.e. higher rates of accumulation need not be associated with lower real wages, even across long-run positions.

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