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Eckhard Hein, Marc Lavoie and Till van Treeck

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Hans-Böckler-Straße 39
D-40476 Düsseldorf
Germany
Phone: +49-211-7778-331
IMK@boeckler.de
http://www.imk-boeckler.de

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Some instability puzzles in Kaleckian models of growth and distribution: A critical survey[#]

Eckhard Hein*, Marc Lavoie and Till van Treeck***

***** Macroeconomic Policy Institute (IMK) at Hans Boeckler Foundation, Duesseldorf, and Carl von Ossietzky University Oldenburg
****** University of Ottawa

Abstract

We tackle the issue of the possible instability of the Kaleckian distribution and growth model and the consequences for the endogeneity of the equilibrium rate of capacity utilization and for the paradox of thrift and the paradox of costs. Distinguishing between Keynesian and Harrodian instability, we review various mechanisms that have been proposed to tame Harrodian instability while bringing back the rate of utilization to its normal rate. We find that the mechanisms that have been suggested are far from being convincing. We thus review some approaches arguing that the adjustment towards a predetermined normal rate should not be expected at all, either because the normal rate reacts to the actual rate, or because of other constraints on the behaviour of entrepreneurs. We conclude that Kaleckian models are more flexible than their Harrodian and Marxian critics suppose when attacking the simple textbook version.

JEL code: E12, E20, O41
Key words: Kaleckian models, distribution, investment function, stability, utilization rate.

Eckhard Hein
eckhard-hein@boeckler.de
Macroeconomic Policy Institute (IMK) at Hans Boeckler Foundation
Hans-Boeckler-Straße 39
40476 Duesseldorf
Germany

Marc Lavoie
marc.lavoie@uottawa.ca
Department of Economics
University of Ottawa
55 Laurier east
Ottawa (Ontario)
Canada K1N 6N5

Till van Treeck
till-van-treeck@boeckler.de
Macroeconomic Policy Institute (IMK) at Hans Boeckler Foundation
Hans-Boeckler-Straße 39
40476 Duesseldorf
Germany

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1. Introduction

The Kaleckian model of growth, as initially suggested by Del Monte (1975), and then put forward by Rowthorn (1981), Taylor (1983), Amadeo (1986) and Dutt (1990), has progressively become quite popular among heterodox economists concerned with macroeconomics and effective demand issues. The model, in its simplest versions, is made up of three equations that involve income distribution, saving, and investment, the latter depending among other things on the rate of capacity utilization. One of the reasons of its success is that the model, in contrast to the old Cambridge growth model, avoids contradictions as it moves from the short run to the long run. In the short run, Keynesians usually assume that most of the adjustments are done through quantities – the rate of capacity utilization with a given stock of capital – and hence there is some consistency in arguing, as do the Kaleckians, that the rate of capacity utilization will play a role as well in the medium- and long-run adjustments. In particular, the model has shown that short-run macroeconomic paradoxes, such as the paradox of thrift or the paradox of costs, whereby a decrease in the propensity to save or an increase in real wages leads to an increase in output, could be extended to the long run, as reflected by an increase in growth rates and an increase in realized profit rates.

As argued in Lavoie (2006), the model has proven to be highly flexible and has generated substantive interaction between economists of different economic traditions, with various versions having been developed by post-Keynesian, Structuralist, Sraffian and Marxist economists alike. One version of the Kaleckian model that has been particularly attractive has been that of Bhaduri and Marglin (1990) and that of Kurz (1990), both papers showing that with an extended investment function the economy could be either wage-led or profit-led, depending on the configuration of the parameters. Various growth regimes could thus arise from this modified investment function or from other extensions of the model. These two papers have given rise to a substantial empirical literature that purports to verify whether rising real wages or rising wage shares could be conducive to faster economic growth, thus suggesting a possible way out for economies suffering from slow growth and high unemployment rates.[1]

As the Kaleckian model has become the source of an ever-growing literature, some authors have started to doubt its relevance, by questioning the stability of the model (Dallery, 2007; Skott, 2008A, 2008B, 2008C; Allain, 2008). Kaleckians usually assume *Keynesian stability*, and draw policy implications based on the comparative analysis that follows from this stability condition – that is, they assume that changes in rates of utilization have a larger impact on the saving function than they do on the investment function. However, some critics doubt that this Keynesian stability condition holds.

There is a somewhat related problem, associated with *Harrodian instability*, which is also underlined by critics. A main characteristic of the Kaleckian model, perhaps its key characteristic, is that the rate of capacity utilization is endogenous, both in the short and in the long run, a feature with which Joseph Steindl (1990, p. 429) himself agreed. This feature of the model has been picked up and questioned from the very beginning, mainly by some Sraffian and Marxist trained authors (e.g., Committeri, 1986; Auerbach and Skott, 1988; Duménil and Lévy, 1995). Their

[1] See the literature review and the estimations for several countries by Hein and Vogel (2008) and the results in Naastepad and Storm (2007), Stockhammer and Ederer (2008), and Stockhammer, Onaran and Ederer (2009), among others.

complaint is that the rate of utilization cannot remain unconstrained in the long run. Whereas in the short run it can move away from the normal degree of capacity utilization – also called the standard rate or the target rate of capacity utilization – there ought to be some mechanism bringing back the actual rate of capacity utilization towards its normal rate. The main point is that if the rate of capacity utilization is higher (lower) than its normal rate in the long run, then the rate of accumulation cannot remain constant, and must drift up (down). In this view, the long-run Kaleckian (pseudo) equilibrium is not sustainable.[2] A problem of Harrodian instability arises, which Kaleckians are said to ignore.

The purpose of the present paper is to tackle the issue of the possible instability of the Kaleckian model. In the next section, we will try to distinguish carefully between Keynesian and Harrodian instability, while showing that, at the empirical level, these two problems may be hard to disentangle in practice. In the third section, we discuss the various mechanisms, and their objections, that have been proposed to tame Harrodian instability while bringing back the rate of utilization in line with its unique normal rate. In the fourth section, we discuss alternative mechanisms that tend to retain the main Kaleckian features, in particular the long-run endogeneity of the rate of capacity utilization.

2. Keynesian versus Harrodian instability

While various authors have questioned the stability of the Kaleckian model, they have not always been clear on whether they meant that the Kaleckian model was subjected to Keynesian instability or to Harrodian instability. In this section, we want to clarify these two distinct forms of instability, although we shall end up proposing that these two kinds of instability may be rather difficult to distinguish in practice. To facilitate the exposition, we start by recalling the three equations of a simple Kaleckian growth model:

(1) $$r = \frac{mu}{v} = \frac{r_n u}{u_n},$$

(2) $$g^s = s_p r, \qquad s_p > 0,$$

(3) $$g^i = \gamma + \gamma_u (u - u_n), \qquad \gamma, \gamma_u > 0.$$

Equation (1) is the distribution or pricing equation, which says that the realized net profit rate r depends on the realized rate of capacity utilization u, on the gross profit margin m, and on the capital to capacity ratio v. The same distribution equation can also be rewritten in terms of the normal profit rate r_n and the normal rate of capacity utilization u_n. The saving function g^s is the standard classical saving equation, which assumes away saving out of wages, with a propensity to save out of profits equal to s_p. Finally, equation (3) is the investment function, where the rate of capital accumulation is said to depend on a parameter γ, which represents some assessment of the trend rate of growth of sales. Thus, whenever the rate of capacity utilization is above its normal rate, firms attempt to bring back capacity towards its normal rate by accumulating capital at a rate that exceeds the assessed trend growth rate of sales. But unless there is

[2] The main characteristics of the Kaleckian model, the paradox of thrift and the possibility of a paradox of costs in the long run are therefore questioned as well.

some kind of fluke, the actual and the normal rates of capacity utilization will differ in this Kaleckian model without any further adjustment. That is the reason why u_n is omitted from the investment function in many simple versions of the Kaleckian model.

For the goods market equilibrium of the model ($g^s = g^i$) the following utilization rate ($u*$) is obtained from equations (1) – (3):

$$(4) \qquad u^* = \frac{\gamma - \gamma_u u_n}{s_p \frac{m}{v} - \gamma_u} \quad .$$

2.1 Keynesian instability

Keynesian stability in this model requires that investment is not too sensitive to changes in the rate of capacity utilization. The slope of the investment function must be smaller than that of the saving function, which means that condition (5) needs to be fulfilled:

$$(5) \qquad s_p \frac{m}{v} > \gamma_u \, .$$

Figure 1

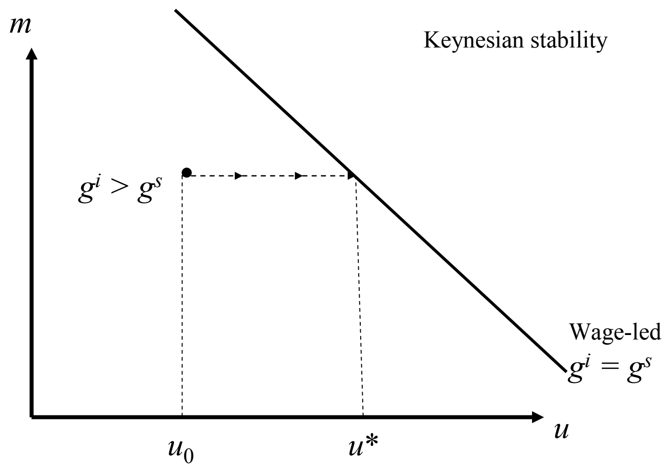
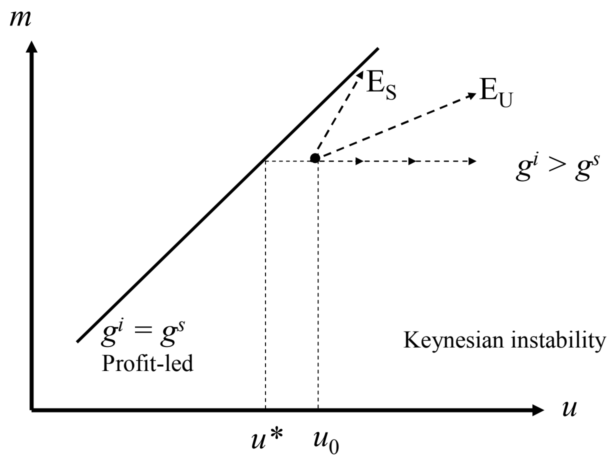


Figure 2



The issue of short-run stability can be seen in two ways. One possibility is to assume a disequilibrium mechanism, whereby the level of output is given in the ultra short period, with firms adjusting the level of output to the disequilibrium in the goods market, that is the discrepancy between desired investment and saving. Thus firms increase the degree of capacity utilization whenever aggregate demand exceeds aggregate supply, in which case we have:

(6) $\Delta u = \mu(g^i - g^s), \qquad \mu > 0\,.$

The Keynesian stability case is illustrated in Figure 1: The economy moves towards the equilibrium locus, which is necessarily wage-led in this simple variant of the model (the locus has an inverse relationship between rates of utilization and profit shares).[3] In the instability case, shown in Figure 2, the equilibrium locus is necessarily profit-led in the simple model (the locus has a positive relationship between rates of

[3] Since from equation (4) we obtain $\frac{\partial u}{\partial m} = \frac{-s_p \frac{u}{v}}{s_p \frac{m}{v} - \gamma_u}$, Keynesian stability from equation (4) implies $\frac{\partial u}{\partial m} < 0$, a wage-led regime and hence the paradox of costs. In the stable case, the paradox of thrift is also valid, because $\frac{\partial u}{\partial s_p} = \frac{-\frac{m}{v}u}{s_p \frac{m}{v} - \gamma_u} < 0$.

utilization and profit shares).[4] However, if there were an additional price mechanism, as discussed by Bruno (1999) and Bhaduri (2008), with profit margins rising when aggregate demand exceeds aggregate supply, it could possibly bring back the economy towards equilibrium, as shown with arrow E_S in Figure 2, in contrast to arrow E_U which shows an unstable process in the face of changing profit margins.

Another way to see Keynesian instability is to imagine a pure adjustment process, assuming that firms are always able to adjust production to sales within the period, thus assuming that the goods market is in equilibrium in each period. It can also be conveniently assumed that firms make their investment decisions on the basis of an expected rate of capacity utilization u^e, which is set at the beginning of the investment period (Amadeo, 1987). In this case, the investment function needs to be slightly modified to:

(3A) $$g^i = \gamma + \gamma_u \left(u^e - u_n\right), \quad \gamma, \gamma_u > 0 .$$

The rate of utilization that will be realized in each period will thus be u^K, such that:

(7) $$u^K = \frac{\gamma + \gamma_u (u^e - u_n)}{s_p \frac{m}{v}} .$$

The expected rate of utilization may thus be unequal to the short-period equilibrium rate, so that we can envisage an adjusting mechanism, such that:

(8) $$\Delta u^e = \theta (u^K - u^e), \qquad \theta > 0 .$$

With Keynesian stability, as illustrated with Figure 3, the economy will be brought towards the equilibrium utilization rate in equation (4).

Figure 4 illustrates Keynesian instability. Entrepreneurs overestimate the equilibrium rate of capacity utilization ($u^e > u^*$), but the realized short-run rate of utilization is even higher than the overestimated rate ($u^K > u^e$), so that entrepreneurs are induced to raise the expected rate of utilization even more, thus moving away from the long-run equilibrium u^*. There is some similitude with Harrodian instability, in the sense that here we have $u^K > u^e > u^*$, whereas Harrodian instability is often interpreted as $g^K > g^e > g_w$, that is the growth rate of sales ends up being higher than the expected growth rate of sales when the latter exceeds Harrod's warranted growth rate (Sen, 1970, p. 12).

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[4] Since from equation (4) we obtain: $\frac{\partial u}{\partial m} = \frac{-s_p \frac{u}{v}}{s_p \frac{m}{v} - \gamma_u}$, Keynesian instability from equation (4) implies: $\frac{\partial u}{\partial m} > 0$, and hence a profit-led regime. The paradox of costs is gone. The same is true for the paradox of thrift, because in the unstable case we have: $\frac{\partial u}{\partial s_p} = \frac{-\frac{m}{v} u}{s_p \frac{m}{v} - \gamma_u} > 0$.

Figure 3

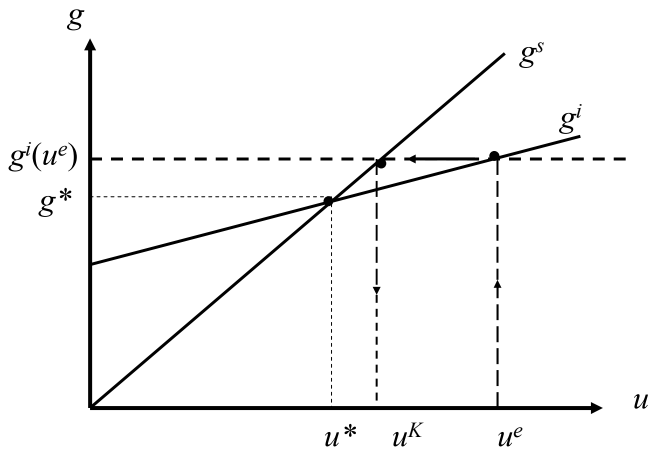
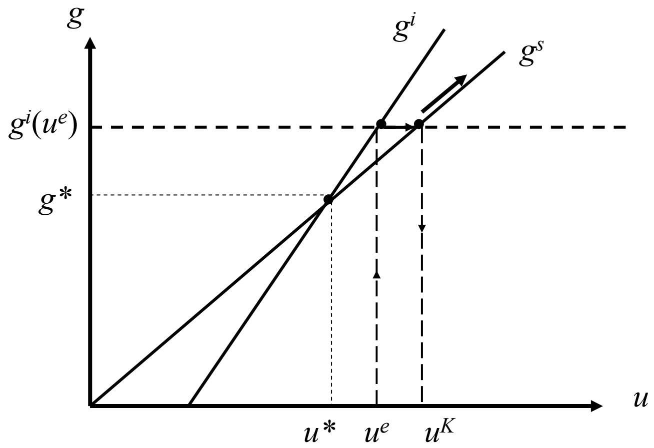


Figure 4



2.2 Harrodian instability

Harrodian instability, however, is not the same thing as Keynesian instability. The latter arises when the investment function is steeper than the saving function. In our simple Kaleckian model, Harrodian instability arises because the γ parameter of the investment function is unstable and rises (decreases) whenever the rate of capacity utilization exceeds (is below) its normal rate. Thus one may have simultaneously

Keynesian stability and Harrodian instability. Formally, critics of the Kaleckian model represent Harrodian instability as a difference or a differential equation, where the change in the rate of accumulation is a function of the discrepancy between the actual and the normal rates of capacity utilization (Skott, 2008B; Skott and Ryoo, 2008).

(9) $$\Delta g^i = \theta(u^* - u_n), \qquad \theta > 0 .$$

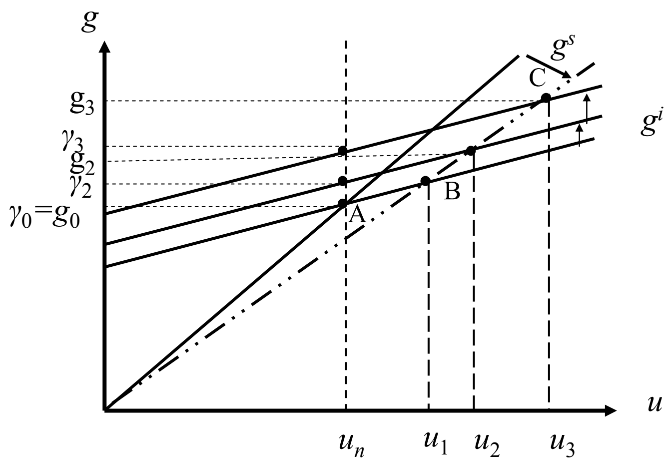
But what this really means in terms of our little Kaleckian model is that the parameter γ gets shifted as long as the actual and normal rates of capacity utilization are unequal:

(10) $$\Delta\gamma = \theta(u^* - u_n), \qquad \theta > 0 .$$

The reason for this is that in equation (3) the γ parameter can be interpreted as the assessed trend growth rate of sales, or as the expected secular rate of growth of the economy. When the actual rate of utilization is consistently higher than the normal rate ($u^* > u_n$), this implies that the growth rate of the economy is consistently above the assessed secular growth rate of sales ($g^* > \gamma$). Thus, as long as entrepreneurs react to this in an adaptive way, they should eventually make a new, higher, assessment of the trend growth rate of sales, thus making use of a larger γ parameter in the investment function.

Equation (10) may be interpreted as a slow process. In words, after a certain number of periods during which the achieved rate of utilization exceeds its normal rate, the investment function starts shifting up, thus leading to ever-rising rates of capacity utilization, and hence to an unstable process. This is illustrated with the help of Figure 5. Once the economy achieves a long-run solution with a higher than normal rate of utilization, say at $u_1 > u_n$, (after a decrease in the propensity to save in Figure 5), the constant in the investment function moves up from γ_0 to γ_2 and γ_3, thus pushing further up the rate of capacity utilization to u_2 and u_3, with accumulation achieving the rates g_2 and g_3, and so on. Thus, according to some of its critics, the Kaleckian model gives a false idea of what is really going on in the economy, because the equilibrium described by the Kaleckian model (point B) will not be sustainable and will not last.

Figure 5



Critics have not always been clear on whether they mean that the Kaleckian model is subjected to a problem of Keynesian instability or that of Harrodian instability. We hope that the present section clarifies the difference between the two kinds of instability. However, in practical terms, it may be quite difficult to differentiate between the two. Suppose that the economy runs on Keynesian stability, but faces Harrodian instability, as in Figure 5. An econometrician observing actual data might measure situations reflected by points A and C in Figure 5, which represent some of the different intersections of the saving function with the shifting investment function. Thus even though the true slope of the investment function is given by the AB line, what is actually measured, by adding lagged effects, may instead be the larger slope AC. If the Harrodian instability effect is strong enough, the slope of the apparent investment function will be very close to that of the saving function, indicating near Keynesian instability. Thus it will be difficult to distinguish between Keynesian and Harrodian instability in practice. In other words, it will be difficult to distinguish between relatively high γ_u parameters and a shifting γ parameter.

Whether the simple Kaleckian model 'suffers' from Keynesian instability or Harrodian instability (with Keynesian stability), the consequences are nearly identical when the economy is subjected to a decrease in the propensity to save or a decrease in the profit margin. With Harrodian instability, there will be a succession of equilibria with ever-rising rates of accumulation and capacity utilization. With Keynesian instability, the new equilibrium is at a lower rate of utilization and a lower rate of accumulation; but since the economy is moving *away* from this equilibrium, the actual rates of utilization and accumulation are ever rising (as indicated by the arrow in Figure 4), as in the case of Harrodian instability.

Thus, in what follows, we consider that entrepreneurs react with enough inertia to generate Keynesian stability.[5] When rates of utilization rise above their normal

[5] This assumption is similar to what Skott (2008A, 2008B) assumes in his critique of the Kaleckian investment function and in his alternative Harrodian model. Dallery's (2007) point instead is that the Kaleckian model either faces Keynesian instability or yields implausible equilibrium solutions. The answer to this is that one cannot expect a simple model that only tracks a couple of variables, without

rates (or fall below their normal rates), entrepreneurs take a wait and see attitude, not modifying their parametric behaviour immediately, until they are convinced that the discrepancy is there to stay. Thus, in what follows, we consider that the main issue at stake is the sustainability of a discrepancy between actual and normal rates of capacity utilization, as well as the related problem of Harrodian instability.

3. Long-run stability of normal utilization with short-run Harrodian instability: Keynesian in the short run and Classical in the long run?

Various mechanisms have been proposed to bring back the rate of capacity utilization to its normal (given) level. In the present section, we explore these mechanisms and provide possible criticisms.

3.1 Robinson, Kaldor and the Cambridge price mechanism: Retaining the paradox of thrift in the long run

It is well-known that in the early Cambridge growth and distribution model, more specifically that of Joan Robinson (1956, 1962), 'the key assumption is that the rate of capacity utilization varies on the path between steady-state configurations, but not across steady-growth states' (Marglin, 1984, p. 125). In other words, the early Cambridge growth model of Robinson and Kaldor assumed the existence of a long-run mechanism – a price mechanism – that is driving back the rate of utilization towards its normal value. This puzzled early American post-Keynesians, most notably Paul Davidson, who even understood the Cambridge model as involving a *short-run* income distribution mechanism:

> 'In Joan Robinson's model, if realised aggregate demand is below expected demand, then it is assumed that competition brings down market prices (and profit margins) *at the normal or standard volume of output.*' (Davidson, 1972, p. 125)

With the Davidson interpretation of the Cambridge price mechanism, we have the following differential equation,

(11) $\Delta r_n = \mu(g^i - g^s), \qquad \mu > 0,$

and where $u = u_n$ at all times.

With the Marglin interpretation of the Cambridge price mechanism, we have instead differential equation (12) or (12A):

(12) $\Delta r_n = \varphi(u^* - u_n), \qquad \varphi > 0,$

(12A) $\Delta r_n = \varphi \frac{u_n}{r_n}(r^* - r_n), \quad \varphi > 0.$

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government and external sectors as well as rudimentary financial relations, to reflect the complexities of the real world. For instance, one does also not expect the simple income-multiplier model to mimic real-world data.

The Marglin interpretation can itself be assessed in two different ways. Looking at equation (12), the Cambridge price mechanism implies that profit margins and hence prices relative to wages rise as long as the actual rate of utilization exceeds the normal rate of utilization, in an effort to bring the rate of capacity utilization to its normal value. Looking now at equation (12A), the Cambridge price mechanism can be understood as an adaptive mechanism, whereby firms raise profit margins, and hence what they consider to be the normal profit rate, whenever the actual profit rate exceeds the previously assessed normal profit rate. This brings back the rate of capacity utilization towards its normal value as a side effect.

A key feature of the Robinsonian Cambridge model is the paradox of thrift. A decrease in the propensity to save leads to a higher rate of accumulation and a higher profit rate, even though the economy comes back to what the Sraffians have called a fully-adjusted position, that is, back to its normal rate of capacity utilization (Vianello, 1985). But this result depends on the specific investment function proposed by Robinson (1956, 1962). As is well-known, her proposed investment function depends on the expected profit rate, itself being determined by past realized profit rates, so that, as a simplification we may write:

(3B) $$g^i = \gamma + \gamma_r r, \quad \gamma, \gamma_r > 0 .$$

With equations (1), (2), and (3B), Keynesian stability requires the following condition:

(13) $$s_p > \gamma_r .$$

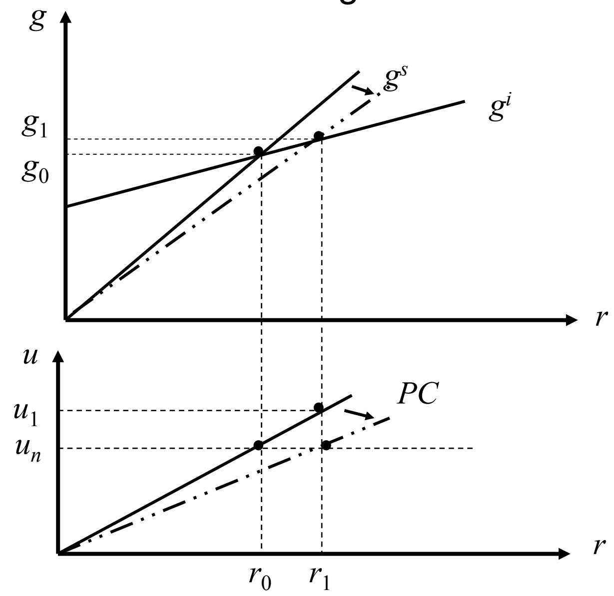
Even if output remains at its normal level, with prices supporting the full weight of adjustment, the stability condition will still be given by equation (13). Finally, since the equilibrium rate of utilization is given by:

(14) $$u^* = \frac{\gamma}{(s_p - \gamma_r)\dfrac{r_n}{u_n}} ,$$

we see that condition (13) insures that the actual rate of utilization will converge to its normal value whenever it exceeds it. Indeed, if $u > u_n$, equation (12) tells us that the normal profit rate r_n will be increased. This will lead to a reduction in the actual rate of utilization provided the denominator of equation (14) is positive, that is, provided stability condition (13) is fulfilled.

The effects of a reduction in the propensity to save are shown in Figure 6. The equilibrium accumulation rate moves from g_0 to g_1 while the rate of utilization slides up from u_n to u_1, (in the Marglin interpretation), thus allowing the profit rate to rise from r_0 to r_1. With above-normal rates of utilization and above normal profit rates, profit margins rise. As a result, the profit curve *PC*, as given by equation (1A), rotates down in the lower part of Figure 6, bringing back the actual rate of utilization towards u_n. But this change in the components of the profit rate has no impact on the Cambridge investment function (3B), so that the growth rate and the profit rate remain at their higher values, g_1 and r_1. Despite the fully-adjusted position, the paradox of thrift is sustained in the long run, but of course there is no paradox of costs.

Figure 6



However, if we combine the Cambridge price mechanism with the standard Kaleckian investment function, given by equation (3), then the paradox of thrift also vanishes in the long run. We leave to readers to draw the graph that corresponds to the following explanation. Through the decrease in the propensity to save, the saving function rotates downward, thus generating faster accumulation and higher rates of utilization. However, the rising profit margins will lead to a countervailing upward rotation of the saving function, and since the profit margin has no direct effect on investment in this model, the rate of accumulation goes back to where it came from.

Although several post-Keynesian authors have picked up some form or another of the Cambridge price mechanism – authors such as G.C. Harcourt (1972, p. 211), Adrian Wood (1975), Alfred Eichner (1976) and Nicholas Kaldor (1985, p. 51) have argued that oligopolistic firms raise profit margins when faced with fast sales growth and high rates of capacity utilization – other post-Keynesians have been critical of the mechanism.[6] Besides Davidson's (1972) annoyance with the Cambridge price mechanism, Steindl (1979, p. 6), Garegnani (1992, p. 63) and Kurz (1994) have argued that rising profit margins were unlikely to be associated with high rates of capacity utilization, and hence with low unemployment and stronger labour bargaining power. If this is so, the Cambridge price mechanism would have to be replaced by what we can call a Radical (or Goodwin) price and distribution mechanism, whereby profit margins decline when rates of capacity utilization are high and unemployment is low, a possibility also recently underlined by Bhaduri (2008).[7] This Radical distribution mechanism assumes that the employment rate starts to rise

[6] Sraffians have also been highly critical of this mechanism, as it implies that income distribution is determined by the rate of accumulation, with higher normal profit rates being tied to faster accumulation. This is what the Sraffians call the Cambridge theory of distribution. Some Sraffians claim instead that the normal rate of profit is essentially determined by the rate of interest, as argued by Pivetti (1985). Other Sraffians, however, such as Schefold (1989, p. 324), take a more eclectic view, arguing that the normal profit rate is influenced by both the interest rate and the growth rate.

[7] See also in a somewhat different framework Hein and Stockhammer (2007, 2008).

(fall) when u* positively (negatively) deviates from u_n. This requires that the associated accumulation and growth rate has to exceed (fall short of) the growth rate of the labour force.

Within the present model, or within the Robinsonian model, the Radical price and distribution mechanism would lead the economy *away* from the normal rate of capacity utilization. One would need a different model, that incorporates an investment function where capital accumulation is a positive function of the normal profit rate, as in the Bhaduri and Marglin (1990) or in the Kurz (1990) models, for such a Radical price and distribution mechanism to be able to bring back the economy towards the given normal rate of capacity utilization, at least for some parameter configurations (Stockhammer, 2004).

In the case where high rates of capacity utilization and high employment rates would induce strong labour unions to flex their muscles and bargain for reduced profit shares that would be resisted by firms, a price-wage-price spiral would ensue with more or less stable income shares. This is Joan Robinson's 'inflation barrier'. Accelerating inflation would then require the introduction of economic policy responses aiming at the elimination of unexpected inflation. We will discuss these related issues in another section below, when dealing with the Duménil and Lévy (1999) approach.

3.2 The Shaikh I solution: the retention ratio as stabilizer, rotating back the saving function and removing the paradox of thrift

Anwar Shaikh is a Marxist economist who has long defended a classical approach or what he has also called a Harrodian approach. In a recent contribution, Shaikh (2007A) proposes a new mechanism which would drive the economy towards the normal rate of utilization in the long run, as desired by many Marxist and Sraffian critiques of the Kaleckian model, while safeguarding some Keynesian or Kaleckian features. Shaikh (2007A, p. 4) claims that 'this classical synthesis allows us to preserve central Keynesian arguments such as the dependence of savings on investment and the regulation of investment on expected profitability, without having to claim that actual capacity utilization will persistently differ from the rate desired by firms'. Shaikh's model starts off with the following nearly standard Kaleckian equations:

(1) $$r = \frac{r_n}{u_n} u \, ,$$

(2A) $$g^s = s_f r + s_h \left(\frac{u}{v} - s_f r \right), \qquad s_f , s_h > 0 \, ,$$

(3C) $$g^i = \gamma_r r_n + \gamma_u \left(u - u_n \right), \quad \gamma_r , \gamma_u > 0 \, .$$

The saving equation (2A) is new and simply reflects the fact that saving in modern economies is made up of two components. The first component corresponds to retained earnings, here represented in growth terms by the term $s_f r$, with s_f standing for the retention ratio of firms on profits. The second component assumes that households save a proportion s_h of their wage and distributed profit income.[8] Investment equation (3C) is a specific version of the more general form given by equation (3). As in the standard Kaleckian model, there is a catch-up term based on the discrepancy between actual and normal rates of utilization. But the equation also borrows from the Bhaduri and Marglin (1990) model, by making investment a function of profitability, as measured by the normal rate of profit, that is, the profit rate at the normal rate of capacity utilization.[9] The introduction of normal profitability in the investment function is fully in line with arguments previously made by Sraffians (Vianello, 1989; Kurz, 1990, 1994; Lavoie, 1995A, p. 797).

Shaikh's original proposition is that the retention ratio of firms, s_f, will react to a discrepancy between the current rate of capacity utilization and the normal rate of capacity utilization, and hence, between the actual rate of accumulation and the rate of accumulation induced by normal profitability. He suggests the following equation:

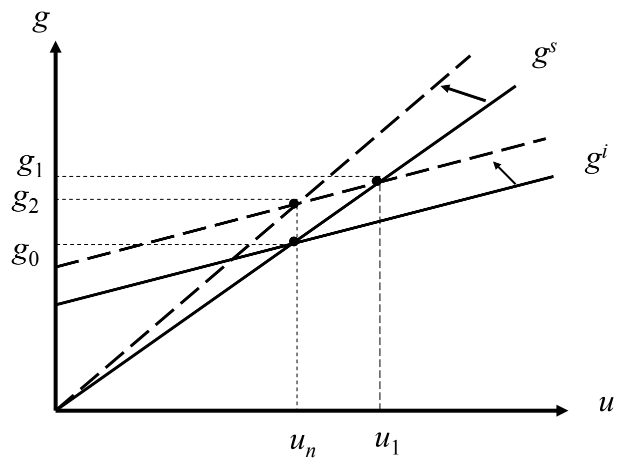
$$(15) \qquad \Delta s_f = \rho(u^* - u_n), \qquad \rho > 0 .$$

The consequences of such a differential equation are shown in Figure 7. The economy is initially at its normal rate of capacity utilization u_n and at the rate of growth g_0. Let us then imagine an increase in animal spirits, which in the present model can be proxied by an increase in the value of the γ_r parameter; for a given normal rate of profit, entrepreneurs decide to accumulate at a faster pace. As a result, on the basis of Keynesian dynamics, the economy moves up to a rate of utilization u_1 and a rate of accumulation g_1. As the slowly-moving adjustment process suggested by Shaikh proceeds, the retention ratio of firms goes up, pushing upwards the saving function until finally the economy is back to the normal rate of capacity utilization u_n. Still, despite this, the economy in the new fully-adjusted position has a rate of accumulation g_2, which is superior to the initial rate g_0.

[8] See Lavoie (1998, p. 420) for instance. According to Robinson (1962, p. 38), 'the most important distinction between types of income is that between firms and households'.

[9] Thus, as in this model, the paradox of costs may or may not hold, thus giving rise to wage-led or profit-led growth.

Figure 7



We may thus conclude that, indeed, saving depends on investment in this model – a Keynesian feature – despite actual rates of capacity utilization being brought back to their normal values. However, the paradox of thrift and the paradox of costs are gone in the fully-adjusted positions. A decrease in the propensity to save of households will generate a compensating rise in the retention ratio of firms, with no change in the long-run rate of accumulation. As to the paradox of costs, an increase in the normal profit rate, and hence a fall in real wages, necessarily leads to a higher rate of accumulation in fully-adjusted positions, at least in the case of Keynesian stability.

This can be readily seen by going back to equation (3C) and assuming that the economy has reached its fully-adjusted position, such that $u^* = u_n$. Because the saving function adjusts to the investment function, as shown in Figure 7, the long-run value of the rate of accumulation is entirely determined by the investment equation, so that the fully-adjusted rate of growth depends positively on animal spirits, proxied by γ_r, and on the normal profit rate. In the long run, we have:

(16) $g^{**} = \gamma_r r_n$.

The only remaining issue is whether one can provide economic justifications for equation (15). A possible one is a ratchet effect, whereby firms set dividends on the basis of normal profits, retaining an ever-larger proportion of their profits when rates of capacity utilization exceed their normal rate. But this mechanism is far from obvious. It is easier to believe that firms have a *higher* retention ratio, instead of a *rising* retention ratio, when rates of utilization are above normal. Why would firms keep raising their retention ratio when rates of utilization are constant or falling, even though they exceed the normal rate? A similar objection is made by Skott (2008A), who questions the relevance of this mechanism. Finally, taking a more empirical point of view, Dallery and van Treeck (2008) argue that under the current paradigm of shareholder value orientation, managers may not be able to change the retention ratio on the basis of the discrepancy between the actual and the normal rates of capacity utilization, because the decision to distribute profits is likely to be determined by the shareholders' claims on profitability.

3.3 The Duménil and Lévy mechanism: Government/monetary authorities get scared and economic policies shift the investment function downwards

In the previous two subsections, we examined mechanisms that relied on rotations of the saving curve to bring back the economy to the normal rate of capacity utilization. In what follows, the mechanisms at work rely on shifts of the investment curve.

3.3.1 The Duménil and Lévy model

Duménil and Lévy (1995, 1999) have long been arguing that Keynesian economists are mistaken in applying to the long run results that arise from the short run. Their claim, in short, is that one should be Kaleckian or Keynesian in the short run, but classical in the long run. What they mean by this is that, in the long run, the economy will be brought back to normal rates of utilization – fully-adjusted positions as the Sraffians would say – and that in the long run classical economics will be relevant again. Put briefly, this implies that in the long run a lower propensity to save will drive down the rate of growth of the economy, and that a lower normal profit rate (that is higher real wages and a lower profit share, for a given technology), will also drive down the rate of accumulation. These authors thus reject the paradox of thrift and the paradox of costs, with the latter implying that a reduction in profit margins leads to a higher realized profit rate.

The Duménil and Lévy (1999) model, just like the Skott (2008A, 2008B, 2008C) and Shaikh II models that we will examine later, all negate Kaleckian results by incorporating a mechanism that leads to a downward shift of the investment function as long as the rate of utilization exceeds its normal value (a mechanism that reduces the value taken by the γ parameter in investment function (3)). While Duménil and Lévy (1999) do not necessarily tackle Harrodian instability, they have pointed out in a number of other works that they consider that the economy is *unstable in dimension*, meaning that if market forces were left unhampered, real growth rates and utilization rates would not remain stable around some short-run equilibria, but would tend either to rise or to drop.

Duménil and Lévy (1999) provide a simple mechanism that ought to tame instability in dimension and bring back the economy to normal rates of capacity utilization. They consider that monetary policy is that mechanism. Their model, as shown by Lavoie (2003) and Lavoie and Kriesler (2007), is strongly reminiscent of the New Consensus model (NCM), where properly conducted monetary policy is the means by which the economy is brought back to potential output. There is also a great deal of resemblance with Joan Robinson's inflation barrier and the reaction of the monetary authorities that she describes (1956, p. 238; 1962, p. 60).[10] We can write their model as equations (1), (2), and (3), with the addition of equation (17):

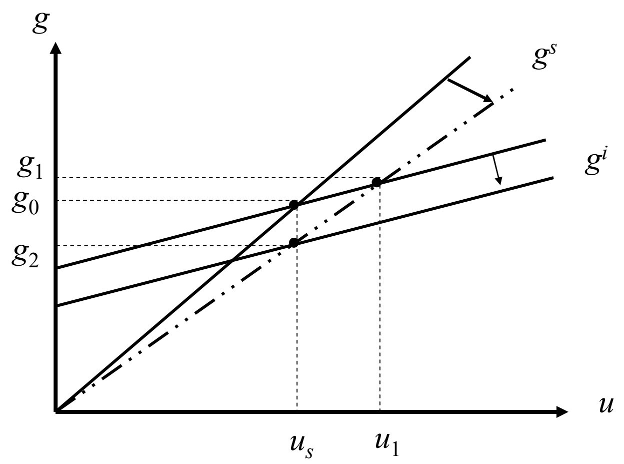
[10] Joan Robinson's views go as far back as 1937; 'The chief preoccupation of the [monetary] authorities is to prevent the rapid rise in prices which sets in when unemployment falls very low, and the fear of this evil seems to be far more present in their minds than fear of the evils of unemployment. As things work out the chief function of the rate of interest is to prevent full employment from ever being attained' (Robinson, 1937, p. 79).

(17) $\Delta\gamma = -\chi(u - u_n), \qquad \chi > 0$.

Equation (17) tells us, in a reduced form, that monetary authorities will tighten monetary policy as long as the actual rate of capacity utilization exceeds its normal value, for instance by raising real interest rates. Presumably, the monetary authorities may fear inflation whenever rates of utilization are too high. As a result, the investment component that does not depend on rates of utilization, measured by γ, gets gradually reduced, until the actual and the normal rates of capacity utilization are equated.

This is illustrated in Figure 8. Suppose that this economy is subjected to a Keynesian adjustment mechanism, and that inflation kicks off with a lag. A decrease in the propensity to save will rotate the saving function downwards, bringing the rate of capacity utilization from u_n to u_1. This generates inflationary pressures, which induce the central bank to raise real interest rates. These will keep on rising as long as inflation is not brought back to zero. As a consequence, the investment function g^i shifts down gradually. It will stop shifting only when it hits back the normal rate of utilization u_n. The end result, however, as can be read off Figure 8, is that the economy now grows at a slower rate, g_2 instead of g_0.

Figure 8



The lesson drawn from this graph is that the economy might be demand-led in the short run, but in the long run it is supply-led. In the long run, the investment adjusts to the saving function, so that the growth rate is determined by the saving function, calculated at the normal rate of capacity utilization, and hence calculated at the normal profit rate. In the long run we have:

(18) $g^{**} = s_p r_n$.

Thus, a reduction in s_p or r_n, in the propensity to save or in the normal profit rate, induces a slowdown of the rate of accumulation in the long run. The paradoxes of thrift and of costs are gone. Over the long run, the economy is necessarily profit-led.

Despite its seducing simplicity, the Duménil and Lévy model suffers from major shortcomings. First, it has to be assumed that a deviation of u from u_n is indeed associated with rising or falling prices/inflation. Duménil and Lévy do not present any precise rationale for this.[11] If we assume that inflation is of the conflicting claims type, their analysis supposes a rising Phillips curve in unexpected inflation and employment/utilization space. The 'normal' rate of utilization is hence associated with what others have dubbed to be a NAICU (a non-accelerating inflation rate of capacity utilization, as in Corrado and Mattey (1997)), in analogy with the NAIRU (non-accelerating inflation rate of unemployment), or else a SICUR (a steady-inflation capacity utilization rate, as in McElhattan (1978)) or a SIRCU (a stable inflation rate of capacity utilization, as in Hein (2006B)). However, if the Phillips curve has a horizontal segment, the NAICU, or what Duménil and Lévy call the 'normal' rate of utilization can take a range of potential values. Within this range, the 'normal' rate is determined by the goods-market equilibrium and is hence endogenous with respect to the actual rate of utilization.[12]

3.3.2 A modified Kaleckian model that takes interest payments into consideration

Even if the Duménil and Lévy assumption regarding the relationship between capacity utilization and inflation holds, it is not clear at all that the adjustment towards the 'normal' rate will take place in the way they describe. To see this, let us take into account the effects of unexpected inflation and of changes in the monetary policy instrument – the nominal interest rate – on income distribution, saving and investment. In order to capture these effects, we have to modify our small Kaleckian model, now made up of the following three equations:[13]

$$(1A) \quad r = \frac{m}{v}u = \frac{r_n}{u_n}u, \quad \frac{\partial m}{\partial i\lambda} \geq 0, \ \frac{\partial r_n}{\partial i\lambda} \geq 0\,,$$

$$(2B) \quad g^s = (r - i\lambda) + s_z i\lambda = \frac{m}{v}u - i\lambda(1 - s_z), \qquad 0 \leq s_z \leq 1\,,$$

$$(3D) \quad g^i = \gamma + \gamma_u(u - u_n) - \gamma_z i\lambda, \qquad \gamma, \gamma_u, \gamma_z > 0\,.$$

Equation (1A) includes the possibility that the mark-up of firms and hence their 'normal' rate of profit may be elastic with respect to their real interest payments relative to the capital stock, i.e., the product of the real interest rate (i) and the debt-to-capital ratio (λ). The real interest rate is given by the nominal interest rate, mainly

[11] On the one hand, Duménil and Lévy argue that in their view changes in prices are a function of supply-demand disequilibria. On the other hand, they consider their analysis as 'reminiscent of Joan Robinson's inflation barrier' (Duménil and Lévy, 1999, p. 699) which indicates that they consider inflation to be the outcome of unresolved distribution conflict.

[12] See Hein (2006A, 2006B, 2008, pp. 133-167), Hein and Stockhammer (2007, 2008), and Kriesler and Lavoie (2007) for models incorporating a Phillips curve with a horizontal segment.

[13] See Hein (2006A, 2006B, 2008, pp. 133-167) and Hein and Stockhammer (2007, 2008) for more elaborated models.

determined by central bank policies, corrected for inflation. Now, perceived permanent changes in the rate of interest and in the debt-to-capital ratio of firms may induce them to increase the mark-up. This is because the mark-up on variable costs has to cover interest costs in the long run, although we may still consider the mark-up to be interest inelastic in the short run.

Saving function (2B) arises from the distinction between the retained profits of firms, which are saved by definition, and saving out of rentiers' income. We assume that the capital stock is financed by accumulated retained earnings, on the one hand, and by bond issues, held by rentiers households, on the other. The saving rate in equation (2B) is therefore given by the rate of profit minus rentier income, plus saving out of rentier income. The latter depend on relative interest payments ($i\lambda$) and the propensity to save out rentiers' income (s_z).

Finally, the Kaleckian investment function, now given by equation (3D), has been modified by introducing the negative effect of relative interest payments by firms. Following Kalecki's (1937, 1954, pp. 91-95) 'principle of increasing risk', distributed profits have a negative effect on the investment of firms because they diminish their internal means of finance for long-term investment, and also reduce their access to external finance, due to incomplete capital markets.

From equations (2B) and (3D) we obtain the goods-market equilibrium rate of utilization, which is given by:

$$(19) \qquad u^* = \frac{\gamma - \gamma_u u_n + i\lambda(1 - s_z - \gamma_z)}{\dfrac{m}{v} - \gamma_u}.$$

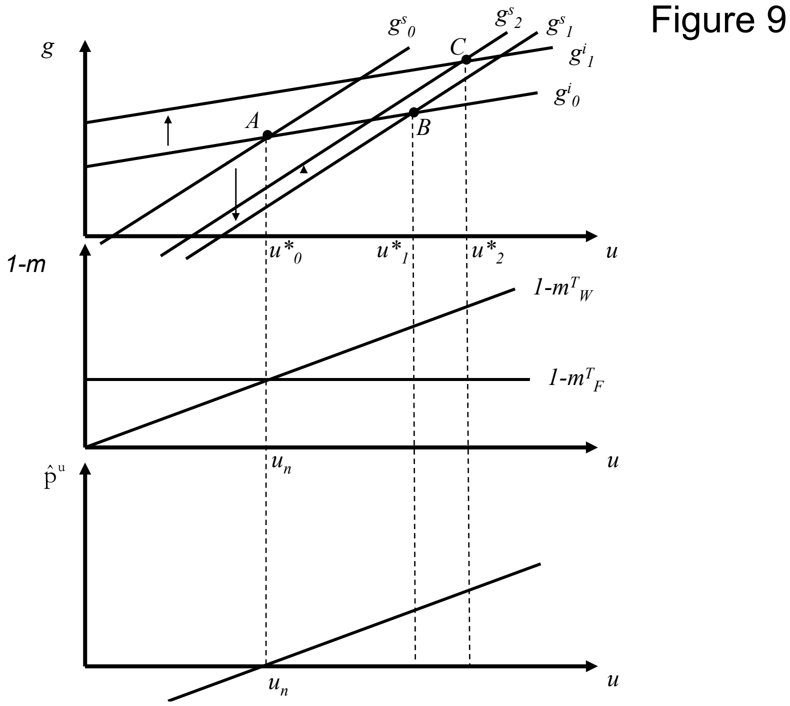
Furthermore, a simple conflicting-claims model of inflation can be described by the following equations:

$$(20) \qquad m_F^T = m_0 + m_1 i\lambda, \qquad m_0 > 0,\ m_1 \geq 0,$$

$$(21) \qquad 1 - m_W^T = \omega_0 + \omega_1 u, \qquad \omega_0 > 0,\ \omega_1 \geq 0,$$

$$(22) \qquad u_n = \frac{1 - \omega_0 - m_0 - m_1 i\lambda}{\omega_1}.$$

The target profit share ($m^T{}_F$) in equation (20) is given by mark-up pricing, with the mark-up being interest inelastic in the short run, but interest elastic in the long run. If there is no economy-wide incomes policy internalizing the macroeconomic externalities of wage setting at the firm or industry level, the workers' target wage share ($1\text{-}m^T{}_W$) in equation (21) rises with the rate of employment, which, for simplification, we assume to move in step with the rate of capacity utilization. For claims to be consistent, the rate of utilization needs to be at a certain level, which we can call the 'normal' rate of utilization (u_n), as described by equation (22), implying a NAICU. To further simplify the analysis, we assume adaptive expectations and also that firms set prices once nominal wages have been agreed upon in the labour market. The latter assumption implies that firms can always realize their income distribution target.



The upper part of Figure 9 shows the well known goods-market equilibrium; in the middle part, we have the target wage shares of firms ($1\text{-}m^T_F$) and of workers ($1\text{-}m^T_W$); and the lower part of the figure shows the modified Phillips curve with the effects of capacity utilization on unexpected inflation, i.e., the change in inflation. With the goods market equilibrium at $u^*_0 = u_n$ (point A), income claims of firms and workers are mutually consistent and unexpected inflation is zero. If we start from this position and assume a decline in the propensity to save out of rentiers' income, the g^s curve in the upper part of Figure 9 shifts downwards and the goods-market equilibrium moves to u^*_1 (point B). Income claims are no longer consistent, and inflation accelerates (with adaptive expectations we have positive unexpected inflation in each period). According to Duménil and Lévy (1999), central banks will introduce restrictive policies, raise interest rates, thus forcing the g^i curve down and stabilising the system back to u_n.

3.3.3 Drawbacks of inflation targeting monetary policies

However, things may not be as simple as Duménil and Lévy suppose, once we take interest payments and debt into account. First, we need to remember that unexpected inflation will feed back on the goods-market equilibrium in the short run. With a given nominal interest rate, unexpected inflation will reduce the real interest rate, and with credit and bonds not indexed to changes in inflation, the debt-to-capital ratio will decline. Taken together, unexpected inflation reduces the real interest payments relative to the capital stock ($i\lambda$). This redistribution in favour of firms and at the expense of rentiers will affect the goods-market equilibrium. In Figure 9, both the g^i and the g^s curves will now shift upwards, so that whether this leads to a higher or lower rate of capacity utilization $u*$ depends on the parameter values. From equation

(19), we obtain the short-run effect of a change in the real interest-capital ratio on the goods-market equilibrium:

(19’) $$\frac{\partial u^*}{\partial i\lambda} = \frac{1 - s_z - \gamma_z}{\frac{m}{v} - \gamma_u}.$$

Assuming Keynesian stability to hold ($\frac{m}{v} > \gamma_u$), we get: $\frac{\partial u^*}{\partial i\lambda} < 0$, if $1 - s_z < \gamma_z$. Therefore, if the propensity to consume of rentiers (1-s_z) falls short of firms’ investment elasticity with respect to interest payments (γ_z), the income redistribution at the expense of rentiers and in favour of firms associated with unexpected inflation will stimulate aggregate demand, and u^* will move farther away from u_n. This is shown in Figure 9: the upward shift in the g^i curve will exceed the upward shift in the g^s curve, and the goods market equilibrium will move to u^*_2 (point C), triggering again unexpected inflation, and so on. In this ‘normal case’ regarding the values taken by the parameters of the saving and investment function, as Lavoie (1995B) calls it, the Duménil and Lévy (and the NCM) monetary policy rule is likely to be successful in bringing down the economy back to u_n. This is because there is no upper limit to the real rate of interest that can be imposed by the monetary authorities, who can hike up nominal interest rates as high as they please. The increasing real interest payments relative to capital force both curves, g_i and g_s, to shift downwards, with the shift in g_i exceeding the one in g_s. Finally, the economy will be back at u_n but at a lower equilibrium accumulation rate (g^*).

However, if $u^* < u_n$, while the same parameter conditions outlined in the previous paragraph prevail (the ‘normal case’ again), stabilisation around u_n by means of monetary policies cannot be taken for granted. To follow the Duménil and Lévy (and NCM) monetary policy rule requires the central bank to reduce the real interest rate. In this situation, however, the policy instrument of the central bank – the nominal interest rate – has a zero percent floor. Hence, when inflation rates are very low or deflation prevails, the monetary authorities may be unable to reduce real rates sufficiently to bring back the actual rate of capacity utilization to u_n. In the ‘normal’ parameter case, the stabilising capacities of monetary policies may therefore be asymmetric.

Consider now the other case, the ‘puzzling case’ as Lavoie (1995b) calls it. From (19’) we get: $\frac{\partial u^*}{\partial i\lambda} > 0$, if $1 - s_z > \gamma_z$. If rentiers’ propensity to consume exceeds the investment elasticity of firms with respect to interest payments, redistribution at the expense of rentiers and in favour of firms associated with unexpected inflation is recessionary, and hence moves u^* back towards u_n (the upward shift in the g^i curve falls short of the upward shift in the g^s curve). In this ‘puzzling case’, the economic system will be self-stabilizing without any monetary policy intervention. Central banks following the Duménil and Lévy monetary policy rule will hence disturb or even prevent the adjustment process.

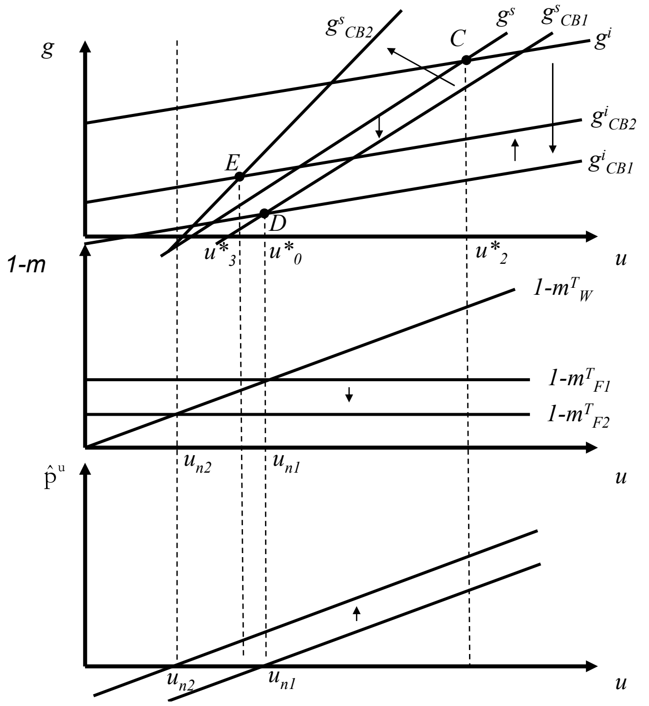


Figure 10

But this is not where the story ends. We need to go beyond the short run, and consider the medium- to long-run effects of changes in the real interest rate induced by monetary policy reactions geared towards stabilising the system. Take Figure 10 and suppose that the 'normal' parameter constellation prevails, with actual utilization exceeding the normal rate ($u^*_2 > u_{n1}$, point C). Suppose further that monetary policies have successfully raised the real interest rate and hence $i\lambda$, thus shifting down the g^s and the g^i curves, and bringing back the economy to $u_{n1} = u^*_0$ (point D) in the short run, but at an accumulation rate that is lower than the initial one (point D in Figure 10 is below point A in Figure 9). However, since real interest rates and real interest payments relative to capital have increased, firms will raise their target mark-ups in the medium to long run. This shifts their target wage share downwards, reduces the NAIRU and the 'normal' rate of capacity utilization, and shifts the Phillips curve upwards, as can be seen in Figure 10. From equation (22) we get:

(22') $$\frac{\partial u_n}{\partial i\lambda} = -\frac{m_1}{\omega_1} < 0 .$$

Redistribution in favour of profits will also affect the goods market equilibrium. Inserting equations (20) and (22) into equation (19) and calculating the long-run effects of a change in the iλ ratio on the equilibrium rate of utilization yields an expansion of (19'):

(19'') $$\frac{\partial u^*}{\partial i\lambda} = \frac{(1 - s_z - \gamma_z) + m_1\left(\frac{\gamma_u}{\omega_1} - \frac{u}{v}\right)}{\frac{m_0 + m_1 i\lambda}{v} - \gamma_u} .$$

Since we assume m_1 to be zero in the short run, but positive in the long run, we obtain a long-run effect on capacity utilization (the second term in brackets in the numerator) – on top of the short-run effect (the first term in brackets in the numerator). This long-run effect via redistribution at the expense of labour may be positive or negative – depending on the values taken by the parameters (γ_u, ω_1) and depending on initial conditions (u^*). Only by accident will the new goods market equilibrium u^*_3 (point E) in Figure (10) therefore be equal to the new normal rate u_{n2}, and further central bank interventions may be required. Graphically, this second-round effect of a rise in the real interest rate (the increased profit share and a reduced 'normal' rate of utilization), amounts to an upwards shift of the investment function and a counter-clockwise rotation of the saving function in Figure 10. This is not the place to elaborate further on the complex interactions between the goods-market equilibrium (u^*) and the normal rate (u_n) triggered by unexpected inflation and generated by monetary policy interventions.[14] What is important for our present purpose, is that the 'normal' rate of utilization as understood by Duménil and Lévy gets modified by monetary policy interventions. The normal rate is hence endogenous to the actual rate, albeit in an indirect and complex way.

3.3.4 Fiscal policies – the way out?

The complex feedback processes between the actual rate of utilization and the 'normal' rate inherent to the Duménil and Lévy approach can only be avoided if a different economic policy variable is chosen to achieve stabilization. Take the model in equations (1A), (2B), (3D), (19) – (22), and assume that fiscal policy, more precisely variations in the government deficit relative to the value of the capital stock, is the discretionary policy instrument used whenever unexpected inflation or disinflation arises, i.e., whenever u^* deviates from u_n. Since autonomous government deficit expenditures can be considered to be part of the constant in the investment function (3D), the effects on the realized rate of capacity utilization are straightforward, because:

$$(19''')\quad \frac{\partial u^*}{\partial \gamma} = \frac{1}{\frac{m}{v} - \gamma_u} > 0 .$$

Therefore, variations in government deficit spending have unique and symmetric effects on capacity utilization. As shown in the upper part of Figure 11, a reduction of government deficit spending would bring back the economy from u^*_2 to u_n (from point C back to point F) by means of shifting the investment function downwards (in the opposite case, $u^* < u_n$, an increase in government deficit spending and hence an upward shift in the investment function would be required). Since in an endogenous money world there are no direct feedbacks of government deficits on the interest rate – provided central banks do not attempt to interfere with fiscal policies –, variations in government deficits do not affect the 'normal' rate in equation (22) and in Figure 11. In this case, the 'normal' rate could hence be considered a strong exogenous attractor,

[14] In Hein (2006A, 2008, pp. 153-167) these interactions are analysed in more detail and different cases are distinguished: a joint equilibrium $u_n = u^*$ by sheer luck; constant, converging or diverging oscillations of u_n and u^*; or monotonic decline of both u_n and u^*.

by means of fiscal policy intervention, for the goods market equilibrium rate of utilization. Note that point F in Figure 11 is below the initial equilibrium, point A in Figure 9, and the new equilibrium is hence associated with a lower rate of capital accumulation.

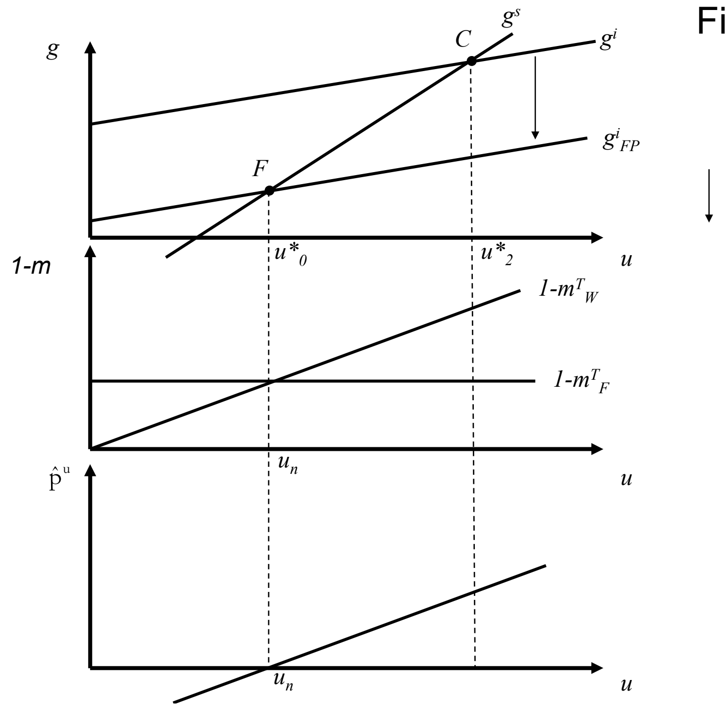


Figure 11

However, even in the case of adjustment of u^* towards an exogenous u_n by means of fiscal policies, the exogeneity of u_n with respect to u^* cannot be taken for granted. As discussed in Hein and Stockhammer (2007) in a more complex model than the one presented here, there are further channels which affect the NAIRU or the 'normal' rate of utilization whenever actual unemployment or the goods-market equilibrium rate of capacity utilization deviate respectively from these rates. Persistence mechanisms in the labour market – previously suggested by New Keynesian authors such as Blanchard and Summers (1987, 1988) and Ball (1999) – are relevant to our modified Kaleckian model.[15] As shown by wage-bargaining or insider-outsider models, persistent unemployment and an increasing share of long-term unemployment in total unemployment, with the associated loss of skills and access to jobs by the long-term unemployed, will decrease the pressure of a given rate of unemployment on the target real wage share of insiders or labour unions, and hence on nominal wage demands. This will then require an increasing total rate of unemployment in order to stabilise inflation. Of course, these mechanisms also work in the opposite direction. Therefore, whenever $u^* > u_n$ in Figure 11, the curve representing the target wage share of workers ($1\text{-}m^T_W$) rotates clockwise, the NAIRU decreases, the Phillips curve flattens, and the 'normal' rate of utilization increases. When we have $u^* < u_n$, this same target wage share curve rotates anti-clockwise, the NAIRU increases, the

[15] In Hein and Stockhammer (2007), apart from labour market persistence mechanisms, there is also a discussion of wage aspirations and conventional behaviour, as well as the effect of investment in fixed capital on the target profit share of firms.

Phillips curve becomes steeper, and the 'normal' rate declines, moving towards the actual rate of utilization.

Taken together, under very special conditions, there may exist an economic policy mechanism that brings the economy back to u_n. However, this mechanism is not monetary policy; it is instead fiscal policy. And this mechanism requires the Phillips curve to be upward sloping, devoid of horizontal segments, and deprived of any endogenous channel moving u_n towards $u*$. If there is a horizontal segment in the Phillips curve, u_n is no longer unique and is determined by $u*$ within the range of this horizontal segment; consequently, the usual Kaleckian results – the paradox of thrift and the paradox of costs – will hold within this range. And if there are market-based endogeneity channels – for instance labour market persistence mechanisms – rising or falling inflation becomes a temporary problem that will be eliminated by an endogenous adjustment of u_n towards $u*$ in the medium to long run. Hence, Hence, if economic policies are satisfied with medium- to long-run price/inflation stability, policy intervention turns out to be unnecessary, and $u*$ determines u_n. Once again the usual Kaleckian results – the paradox of thrift and the paradox of costs – will hold.

3.4 The Skott mechanism: Capitalists get scared and shift the investment function downwards

Peter Skott is one of the main critics of the Kaleckian investment function and the notion of long-run endogeneity of the rate of capacity utilization. In recent papers he has argued that the Keynesian/Kaleckian stability condition might hold in the short run, but that it will not in the long run (Skott 2008A, 2008B, 2008C). Therefore, in the long run, the simple Kaleckian model suffers from Harrodian instability, as shown in equations (9) and (10) and in Figure 5. However, Skott sees this as a real-world feature rather than as a drawback of the model. The main remaining task, according to Skott, is to develop models which may be locally Harrodian unstable but globally stable. Therefore, the task is to find the mechanisms that contain Harrodian instability at a certain point in the long run, and Skott discusses some of these mechanisms.

Skott's models usually have three different runs:[16] First, there is an ultra short run in which the capital stock and output are given, while demand and supply in the goods market are adjusted by a fast price mechanism. This mechanism modifies income distribution in a Kaldorian way, i.e., excess demand causes rising prices and a higher profit share. Secondly, there is a short run, where the capital stock is still given (or moves rather slowly), but where output can be adjusted. The rate of capacity utilization is thus an endogenous variable in this short run. Thirdly, there is a long run, during which firms adjust the capital stock in order to achieve their desired rate of capacity utilization. This desired rate may either be a constant or be itself dependent on capital accumulation in an inverse way (Skott, 2008C, p. 11). It is this long-run adjustment process that may give rise to Harrodian instability around a steady growth path.

Skott (2008C) discusses four variants of a Harrodian model: Labour supply may or may not be perfectly elastic, thus giving rise to the 'dual' and 'mature' economies; and the adjustment speed of prices may be faster or slower than the adjustment speed of quantities, giving rise to the 'Kaldor/Marshall' analysis and to the 'Robinson/Steindl' approach. By crossing over all these, one gets the four variants.

[16] See also Skott (1989A, 1989B).

However, the underlying assumption, in particular regarding the three 'model runs' mentioned above, are not always made transparent. In the 'Kaldor/Marshall analysis' with perfectly elastic labour supply, the relatively faster price adjustment mechanism seems to be valid for all three runs, thus preventing Harrodian instability and stabilising the system through the Cambridge price mechanism described in Section 3.1 above. Alternatively, with slow price adjustment (the 'Robinson/Steindl' approach), stability in the 'dual economy' requires a sluggish adjustment of the rate of capital accumulation to changes in the profit rate, which implies that the Robinsonian stability condition has to hold (see equation (13) in section 3.1). Therefore, this does not seem to add anything new to our discussion of the Cambridge adjustment process in Section 3.1.

In the 'mature', labour-constrained economy, as described by Skott, another mechanism containing Harrodian instability is supposed to be at work, however.[17] In the 'dual economy' output expansion was a positive function of the profit share only, which means that ultra short-run excess demand triggers rising prices and a rising profit share. This then induces firms to increase production in the short run and to speed up capital accumulation in the long run. In the 'mature economy', however, the employment rate is entered as an additional, negative, determinant of the willingness of firms to expand their output. Skott's arguments are as follows. When the economy moves beyond u_n and growth exceeds the (exogenous) growth of labour supply, unemployment falls, firms have increasing problems to recruit additional workers, workers and labour unions are strengthened vis-à-vis management, workers' militancy increases, monitoring and surveillance costs rise, and hence the overall business climate deteriorates. This negative effect of increasing employment finally dominates the production decisions of firms, output growth declines, capacity utilization rates falls, investment falters, and finally profitability declines. Under certain parameter conditions this mechanism gives rise to a limit cycle around the steady growth path given by the labour supply growth, marrying Harrodian instability with a stabilising Marxian labour-market effect.[18] Since the steady state in this model is given by labour supply growth, rising animal spirits or a falling propensity to save only have level effects on the growth path but do not affect the steady state growth rate.

The integration of a stabilising Marxian labour market effect into our simple Kaleckian model in equations (1) – (3) with short-run Harrodian instability in equation (10) requires again to add equation (17) to the model:

$$(17) \qquad \Delta\gamma = -\chi(u - u_n), \qquad \chi > 0 .$$

Formally, this extension is exactly equivalent to the integration of the Duménil and Lévy (1999) policy rule introduced into the Kaleckian model in section 3.3. The difference, however, is the interpretation of equation (17). Whereas the Duménil and Lévy model generates a downward shift in the investment function, as shown in Figure 8, through the imposition of a restrictive monetary policy that purports to fight inflation, in the Skott model it is capitalists themselves who cause the downward shift in the investment function when $u^* > u_n$.[19] If the unemployment rate falls below its

[17] This is true for both Skott's 'Kaldor/Marshall' analysis and his 'Robinson/Steindl' approach.

[18] See Skott (1989A, pp. 94-100, 1989B) for an explicit analysis. Skott's analysis attempts to bring in effective demand into Goodwin's (1967) classical Marxian cycle generated by the direct interaction of distribution, accumulation and employment.

[19] Skott's (2008C) reference to Kalecki (1943) is therefore misleading, because in Kalecki high employment gives rise to economic policy interventions designed to protect business, and hence gives

steady state value, capitalists reduce output growth, sales growth declines and the constant in the investment function (equation (3)) starts to shrink, driving the economy towards u_n.

In our view, Skott's approach also suffers from major problems. These are related to the proposed stabilisation process giving rise to the limit cycle, on the one hand, and to the determination of the steady growth path, on the other.

First, in a model describing a capitalist economy – with decentralised decision-making in a classical competitive environment, where competition between different firms is an active process[20] – it is not clear at all why falling unemployment rates, accompanied by more powerful workers and labour unions, should induce capitalists to reduce output growth in the first place. One would rather be tempted to assume that falling unemployment generates rising nominal wage growth, both because the bargaining power of labour unions has increased and because capitalists compete for scarcer labour resources. This should cause either rising inflation or a falling profit share, or both. None of these direct effects, however, are discussed by Skott. In his models, a reduction in the profit share is instead the result of falling output growth and falling investment. What is also missing in Skott's models is a discussion of the effects of income redistribution on aggregate demand. Output expansion as a positive function of the profit share and a negative function of employment seems to be a far too simple and seems to exclude Kaleckian results by assumption.

If we include conflict inflation as the first possible consequence of unemployment falling below some short-run NAIRU associated with the 'normal' rate of capacity utilization (the NAICU) into our interpretation of the Skott model, we can apply to it the critique of the Duménil and Lévy model that we presented in the previous section. In the 'normal' case of this model, u^* will therefore further deviate from u_n. If we further include into our basic model a radical income distribution mechanism, meaning an income redistribution in favour of labour whenever $u^* > u_n$, this will further accelerate aggregate demand and move u^* farther away from u_n, because our model is wage-led.[21] Thus the Marxian labour market mechanisms intensify Harrodian instability instead of containing it.[22]

Second, Skott's assumption that the steady growth path is determined by the growth rate of the labour force seems to be questionable, even within his own model. If it is conceded that labour supply growth may be endogenous to the employment rate, as Skott (2008C, p. 14) does, the implications for the Marxian stabilisation mechanism have to be analysed in more detail. If labour supply increases whenever $u^* > u_n$ and unemployment approaches some critical level, thus triggering Skott's Marxian stabilising labour market processes, this critical level might not be reached at all and stabilisation might not take place. Related consequences would have to be analysed taking into account possible further endogeneity channels with respect to u_n.

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rise to a political business cycle: "the pressure of […] big business would most probably induce the Government to return to the orthodox policy of cutting down the budget deficit" (quoted from Kalecki, 1971, p. 144).

[20] See Eatwell (1987) and Semmler (1987) for a distinction of Classical and Marxian theories of competition from the neoclassical notion of 'perfect competition'. See also Shaikh (1978, 1980).

[21] A Radical distribution mechanism would stabilise the economy at the 'normal rate' if the economy were profit-led. This would require a Bhaduri and Marglin (1990) investment function instead of our function in equation (3). See Stockhammer (2004) for such a model, as well as Bhaduri (2008) and Lavoie (2008).

[22] See Hein and Stockhammer (2007, 2008) for a more detailed discussion in a model in which unexpected inflation and redistribution between capital and labour – as well as between rentiers and firms – arise simultaneously.

3.5 The Shaikh II mechanism: Capitalists have perfect foresight and shift the investment function downwards

Finally, we deal with another mechanism that claims to solve the problem of Harrodian instability and to bring back classical results. In another recent contribution, in line with some of his previous papers, Shaikh (2007B) claims that Harrodian instability is not a problem, provided a proper investment equation is being used. Shaikh affirms that while the Harrodian approach is a crucial insight, the warranted path can be shown to be stable. Shaikh (2007B) makes a distinction between the standard Kaleckian investment function, which we have already defined as equation (3) and which we repeat here for convenience:

(3) $$g^i = \gamma + \gamma_u(u - u_n), \quad \gamma, \gamma_u > 0\,.$$

and the Hicksian stock-flow investment adjustment equation, which he defines as:

(3E) $$g^i = g_y + \gamma_u(u - u_n), \quad g_y, \gamma_u > 0\,,$$

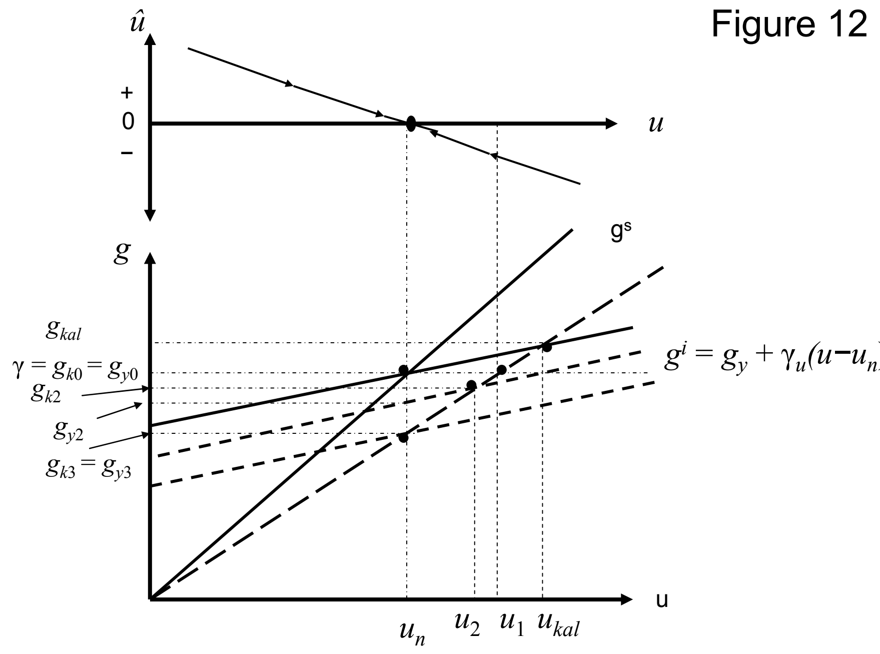
where g_y is the rate of growth of output, by contrast with g^i which is the rate of accumulation or the growth rate of capital (and also the growth rate of capacity, assuming away any change in the capital to capacity ratio).
Shaikh assumes the existence of a Kaleckian/Keynesian mechanism, whereby sales are equal to output within the period, so that the growth rate of sales and the growth rate of output are identical. Because we know that, by definition, as long as we exclude any change in the capital to capacity ratio (v),

(23) $$g_y = g + \hat{u}\,,$$

it follows that:

(24) $$\hat{u} = -\gamma_u(u - u_n).$$

Thus, with investment equation (3E), the rate of utilization converges towards its normal value u_n, since the derivative of equation (24) with respect to u is negative. The Harrodian instability problem would thus be avoided through the use of investment equation (3E). Dynamic stability is shown on the top part of Figure 12.



How do the Kaleckian and the Hicksian investment functions get distinguished from each other? We shall see that the mechanisms at work and the informational requirements are quite different.

Take the case of a shock to an economy that would be sitting at a fully-adjusted position, at a rate of utilization u_n, as in Figure 12. Suppose there is a shock to this economy that could arise from a decrease in the propensity to save out of profits s_p. The saving function rotates downward. We assume that in the short run there is no change in the rate of accumulation decided by entrepreneurs. Thus starting from a situation with balanced growth, with the rate of growth of output being equal to the rate of growth of capital, $g_{y0} = g_{k0}$, the higher level of aggregate demand translates itself into a higher rate of capacity utilization, which moves from u_n to u_1. Thus, during this transition, the rate of growth of output rises above the rate of growth of capacity, as can be guessed from equation (3E).

In the Kaleckian model, this short-run result would be followed by further increases in the rates of growth and in the rate of capacity utilization. In the new long-run equilibrium, the growth rate of accumulation would adjust to the growth rate of demand, such that both growth rates would reach g_{kal} in Figure 12. As to the rate of utilization, it would rise further, finally reaching u_{kal}. Thus during the transition towards the long-run Kaleckian equilibrium, we would have the following inequalities, $g_y > g_k > \gamma$.

It should be noted that in the Kaleckian model the informational requirements are very weak. The rate of accumulation is determined by the current values of the rate of utilization, but it would make no difference whatsoever if it were determined by past values of the rate of utilization. Also, as pointed out earlier, the rate of accumulation depends on some assessed normal rate of growth. As long as this value γ is set as a constant, no Harrodian instability problem can arise. One can imagine that firms set a rate of accumulation of capacity at the beginning of the year, on the basis of the assessed growth norm and based on past rates of capacity utilization. Then, in the course of the year, they adjust output, equating it to aggregate demand.

Things are completely different in the case of the Hicksian investment function proposed by Shaikh. Firms must know the value of the current growth rate of output, and hence the current growth rate of sales, that is g_y, when they make their investment decisions and hence set g. They must also know the current rate of capacity utilization. They must make no mistakes. For if they do, as shown by Skott (2008A, p. 25) – say because they base their estimates of the current growth rate of sales on past growth rates, as they would if they behave in an adaptive manner – then the Hicksian stabilizing mechanism won't work and the model becomes unstable. In other words, there is a kind of saddle path equilibrium, as in the neoclassical models with rational expectations. In a sense, this is not surprising, since firms with investment equation (3E) must be endowed with perfect foresight, being able to correctly assess future growth rates of sales, while making them coherent with their investment decisions, something that can only be possible if firms have a full understanding of the underlying structure of the economy. The informational requirements are thus huge, relative to those of the Kaleckian model, because the growth rate of sales depends on what all other firms are doing, as also pointed out by Palumbo and Trezzini (2003, p. 119) in their critique of Shaikh-like adjustments towards fully-adjusted positions. Hence, there is a coordination problem, which is swept away by Shaikh.

How the Shaikh model functions is illustrated with Figure 12. Suppose that the economy has reached the rate of utilization u_1 following the reduction in the propensity to save. As the top of the figure shows, this is only consistent with a reduction in future rates of capacity utilization. Despite the fact that the growth rate of sales during the transition that led to the rate u_1 has exceeded the initial growth rate of the economy ($g_{k0} = g_{y0}$), the investment function is such that entrepreneurs must now expect a growth rate of sales and output which is *lower* than this initial growth rate, implying that the investment function in our graph must now shift down. This last step is a bit hard to swallow.

If entrepreneurs were to expect a higher growth rate of sales than the initial rate (higher than g_{y0}) the investment function would need to shift up. But then the investment function could only intersect the saving function at a rate of utilization higher than u_1. It would contradict the shape of investment function (3E), as well as the top part of Figure 12 since the rate of accumulation (g) must exceed the rate of growth of sales and since the rate of utilization must decrease when it is above its normal value.

Thus, the investment function must shift down, and hence the expected rate of growth of sales of the current period must be lower than the initial rate of growth g_{y0}. In Figure 12, we have a possible transitional equilibrium, where the rate of capacity utilization is brought down to u_2, while the growth rate of sales and output falls down to g_{y2}, with the rate of accumulation dropping from g_{k0} to g_{k2}, with $g_{k2} > g_{y2}$, as required by the algebra of equation (3E). This process will continue until the rate of capacity utilization is brought back to its normal level, u_n, at which point all growth rates – of capacity, sales, output – will be brought down to $g_{k3} = g_{y3}$. Thus Figure 12 corresponds to the time-series shown in Figure 1 of Shaikh (2007B).

With his so-called Hicksian stock-flow adjustment mechanism, which we call the Shaikh II adjustment mechanism, Shaikh (2007B, p. 8) claims that the Harrodian 'warranted path can be perfectly stable'. In addition, the mechanism is such that although Keynesian or Kaleckian effects can be observed in the short run, in the long run the economy behaves in a classical way. A lower propensity to save, or a lower normal profit rate (higher real wages), both lead to a lower rate of accumulation in the long run, with the rate of utilization coming back to its normal level. Thus in the long run, at $u = u_n$, the rate of accumulation is simply determined by equation (18), and hence $g^{**} = s_p r_n$. There is no paradox of thrift anymore in the long run, and neither is there any paradox of costs. Thus, Shaikh can conclude, as Duménil and Lévy (1999) have, that economists ought to be Keynesian for the short run but of classical obedience for the long run. The Shaikh II adjustment that leads to this result is not credible however.

4. Short-run Harrodian (or Keynesian) instability and long-run (incomplete) adjustments of actual and normal rates of utilization: Paradox of thrift and costs still valid?

4.1 Questioning the necessity of any adjustment

So far, we have dealt with mechanisms that intended to bring back the economy towards the normal rate of capacity utilization, assuming that this normal rate was given and unique. Not all post-Keynesians would agree, however, that normal rates of utilization are unique.[23] Neither would all post-Keynesians agree that economic analysis must be conducted under the restriction that some mechanism brings back the economy towards normal rates of utilization.

Chick and Caserta (1997), among others, have argued that expectations and behavioural parameters, as well as norms, are changing so frequently that long-run analysis, defined as fully-adjusted positions at normal rates of capacity utilization, is not a very relevant activity. Instead, they argue that economists should focus on short-run analysis and what they call medium-run or provisional equilibria. They are defined as arising from the equality between investment and saving, or between aggregate demand and aggregate supply. These short-run and medium-run equilibria are what we have defined as the u^K and u^* equilibrium values of the rate of utilization in section 2.

There is another post-Keynesian way out, to avoid the need to examine mechanisms that would bring rates of utilization back to their normal value. As pointed out by Palumbo and Trezzini (2003, p. 128), Kaleckian authors tend to argue that 'the notion of "normal" or "desired" utilization should be defined more flexibly as a range of degrees rather than as a single value'. Under this interpretation, the normal rate of capacity utilization is more a conventional norm than a strict target, and hence firms may be quite content to run their production capacity at rates of utilization that are within an acceptable range of the normal rate of utilization. If this is correct, provisional equilibria could be considered as long-run fully-adjusted positions, as long as the rate of capacity utilization remains within the acceptable range. Indeed, John Hicks himself seems to have endorsed such a viewpoint. He points out that:

> 'The stock adjustment principle, with its *particular* desired level of stocks, is itself a simplification. It would be more realistic to suppose that there is a range

[23] Some critics of the Kaleckian model also believe that the normal rate of utilization may not be unique. For instance, Skott (1989A, p. 54) argues that the normal rate of utilization is set based on an entry deterrence strategy, such that high net profit margins induce the adoption of a low desired rate of capacity utilization.

> or interval, within which the level of stock is "comfortable", so that no special measures seem called for to change it. Only if the actual level goes outside that range will there be a reaction.' (Hicks, 1974, p. 19)

Also, as long as rates of utilization remain within the acceptable range, firms may consider discrepancies between the actual and the normal rates of utilization as a transitory rather than a permanent phenomenon. As a consequence, the Harrodian instability mechanism, which would induce firms to act along the lines of equation (10), with accelerating accumulation when actual utilization rates surpass the normal rate, might be very slow, getting implemented only when entrepreneurs are persuaded that the discrepancy is persisting. Given real-world uncertainty and the fact that capital decisions are irreversible to a large extent, firms may be very prudent, so that the Harrodian instability may not be a true concern in actual economies.

A further point needs to be made. Some authors, such as Skott (1989A) have argued that if firms behave along profit-maximizing lines, there will be a unique profit-maximizing rate of capacity utilization (for a normal profit rate), corresponding to the optimal choice of technique. Now, as Caserta (1990, p. 151) points out, reserve capacity can be understood in at least two different meanings. Kurz (1986), who is often cited as a reference for those insisting on normal capacity use, studies reserve capacity in the first sense, meaning the duration or the intensity of operation of a plant during a day. What Kaleckians have in mind is instead idle capacity, as defined in statistical surveys of capacity use. They believe that each plant or segment of plant is operated at its most efficient level of output per unit of time; however, some plants or segments of plants are not operated at all. Firms are cost minimizers, but they have little control over the rate of capacity utilization as defined here.[24] It is telling to note that Kurz (1994, p. 414), when studying reserve capacity in the second sense, concludes that 'it is virtually impossible for the investment-saving mechanism … to result in an optimal degree of capacity utilization'. He even adds that 'it is, rather, expected, that the economy will generally exhibit smaller or larger margins of unutilized capacity over and above the difference between full and optimal capacity'. Elsewhere, Kurz (1993, p. 102) insists that 'one must keep in mind that although each entrepreneur might know the optimal degree of capacity utilization, this is not enough to insure that each of them will be able to realize this optimal rate'.[25]

This being said, although we believe the above statements represent strong arguments, we do not wish to 'sweep the problem of the long run relevance of Kaleckian models under the carpet' (Commendatore, 2006, p. 289). We recognize the relevance of the concerns of those economists who object to provisional Kaleckian equilibria as the final word. These critics of the Kaleckian model argue that the normal rate of capacity utilization is a stock-flow norm (Shaikh, 2007B, p. 6), linking the stock of capital with the production flow, and that entrepreneurs should act in such a way that the norm ought to be realized. There are however other norms that are not necessarily realized, despite the best efforts of economic agents. For instance, the propensities to save out of income and wealth determine a wealth to income stock-flow norm for consumers, but this norm is never *exactly* achieved in a growing economy (Godley and Lavoie, 2007, p. 98). Neither is the inventories to sales ratio. Thus it is not a foregone conclusion that norms ought to be realized in the long run within a coherent framework.

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[24] Cf. Lavoie (1992, p. 328).

[25] This passage is translated from the French.

However, besides the mechanisms that we identified and criticized in the previous section, are there some other mechanisms, more akin to post-Keynesian economics, that could be uncovered and that could tackle the possible discrepancy between actual and normal rates of utilization, the latter understood as target rates of firms? This is the subject of the remainder of this section.

4.2 Goods and labour market reactions stabilise the system I: Entrepreneurs adjust their assessment of the normal rate of capacity utilization

While Marxist or classical economists would argue that the actual rate of capacity utilization needs to tend towards the normal rate, a possible alternative is to reverse the causality of the mechanism, and argue instead that the normal rate of capacity utilization tends towards the actual rate. As Park (1997, p. 96) puts it, ‘the degree of utilization that the entrepreneurs concerned conceive as “normal” is affected by the average degree of utilization they experienced in the past’. Indeed, Joan Robinson has herself argued that normal rates of profit and of capacity utilization were subjected to adaptive adjustment processes, as the following quote shows:

> ‘Where fluctuations in output are expected and regarded as normal, the subjective-normal price may be calculated upon the basis of an average or standard rate of output, rather than capacity. [...] profits may exceed or fall short of the level on the basis of which the subjective-normal prices were conceived. Then experience gradually modifies the views of entrepreneurs about what level of profit is obtainable, or what the average utilization of plant is likely to be over its lifetime, and so reacts upon subjective-normal prices for the future.’ (Robinson, 1956, pp. 186, 190)

We can imagine various adaptive mechanisms that take into account both the flexibility of the normal degree of capacity utilization and the Harrodian instability principle. One possible mechanism deals only with the investment function, and was investigated by Lavoie (1995A, pp. 807-8; 1996). The γ parameter in investment function (3) is often interpreted as the secular growth rate of the economy, or the expected growth rate of sales. Firms are then interpreted as speeding up accumulation, relative to this secular growth rate, when current capacity utilization exceeds the target, thus trying to catch up. One would also think that the expected trend growth rate is influenced by past values of the actual growth rate. With normal rates of capacity utilization also being influenced by past actual rates, the two dynamic equations are given by:

(25) $\Delta u_n = \sigma(u^* - u_n), \qquad \sigma > 0,$

(26) $\Delta\gamma = \Omega(g^* - \gamma), \qquad \Omega > 0.$

Making the proper substitutions, these two equations get rewritten as:

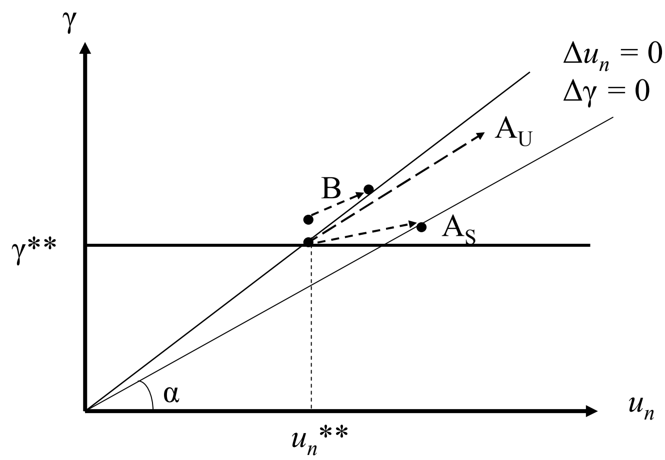
(25A) $\Delta u_n = \dfrac{\sigma(\gamma - \alpha u_n)}{\alpha - \gamma_u},$

(26A) $\Delta\gamma = \dfrac{\Omega\gamma_u(\gamma - \alpha u_n)}{\alpha - \gamma_u}$.

with $\alpha = s_p m/v$, and hence the differential function relevant to the perceived growth trend is:

(26B) $\Delta\gamma = \dfrac{\Omega\gamma_u}{\sigma}\Delta u_n$.

Figure 13



We now have a continuum of equilibria, such that $\Delta u_n = \Delta\gamma = 0$, shown in Figure 13, and which corresponds to the long-run equilibrium:

(27) $g^{**} = \gamma^{**} = \alpha u_n^{**} = s_p \dfrac{m}{v} u_n^{**}$

With a decrease in the propensity to save s_p, or with a decrease in the profit margin m, the continuum of long-run equilibria rotates downward, and two cases arise. When dynamic equations (25) and (26) describe a stabilizing process, the normal rate of utilization and the perceived growth trend rise up to a point such as A_S in Figure 13. *The paradoxes of thrift and of costs thus still hold, even in the fully-adjusted positions.* The dynamic process, however, may be unstable, as shown by arrowhead A_U. The process will be stable provided the transitional path has a smaller slope than that of the new demarcation line, that is provided we have $d\gamma/du_n = \Omega\gamma_u/\sigma < \alpha$, which means that $s_p m/v > (\Omega/\sigma)\gamma_u$. If the Keynesian stability condition given by equation (5) holds, then a sufficient condition for dynamic stability is simply $\sigma > \Omega$. In other words, the Harrodian instability effect, represented by equation (26) which tells us that entrepreneurs will raise their expectations about future growth rates whenever current realized growth rates exceed the current trend estimate, must not be too large.[26]

An interesting characteristic of the present model is that it features what Setterfield (1993) calls *deep endogeneity* or hysteresis. The new fully-adjusted position depends on the previous fully-adjusted position. Very clearly, it also depends on the reaction parameters during the transition or traverse process, and hence we may also say that it is path-dependent, leading Lavoie (1995A, p. 807) to speak of a 'possibility devoid of definite solutions'.[27] In contrast to what Commendatore (2006, p. 289) claims, we *do not* believe that 'the Keynesian nature of the analysis is severely reduced' with the adoption of these dynamic equations. An increase in the animal spirits of the entrepreneurs or in their expectations with regards to the future growth of sales would be reflected in an upward shift of the γ parameter, which would drive the economy along the B arrow in Figure 13.

A few other similar models, with an endogenous normal rate of capacity utilization, have been constructed. Dutt (1997) has equations that turn out to be similar to equations (25A) and (26A), but they are based on an entry deterrence mechanism.[28] Lavoie (1996) also considers a model where the mechanisms of equations (25) and (26) are extended to the pricing equation, a suggestion that seems to be approved by Park (1997). A two-sector version is investigated by Kim (2006), who finds that the paradox of thrift still holds. Perhaps the most complete model is that of Cassetti (2006), where the trend growth rate γ, the normal rate of capacity utilization u_n, and the normal profit rate r_n are all endogenized, reacting to their past values, while in addition the rate of capital scrapping gets speeded up as long as the actual rate of capacity utilization lies below its normal rate.[29] Cassetti also finds hysteresis effects, with the saving paradox prevailing, while the paradox of costs may or may not occur in fully-adjusted positions.

Another Kaleckian model with endogenous normal rates of utilization is that of Commendatore (2006), which involves non-linear changes in profit margins in a discrete-time framework. Commendatore shows that, at least for some parameter values, the average rate of utilization will be quite different from the initial normal rate of utilization, with aggregate demand thus playing an important role even in the long run. This is thus the lesson that can be drawn from all these models with endogenous normal rates of capacity utilization: high animal spirits and low propensities to save do have a positive long-run effect on the economy, while the paradox of costs may or may not hold.

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[26] This is an assumption ususally made by Sraffian authors, for instance Committeri (1986, p. 179).

[27] Kaldor (1934, p. 125), who from the beginning was unhappy with comparative static analysis, defines path-dependent equilibria as 'indeterminate' equilibria. Unstable equilibria in his terminology are 'indefinite' equilibria.

[28] Dutt's (1997) mechanism is criticized by Skott (2008A, p. 13), who questions the sign of equation (25A) and whether a differential equation is relevant to an entry deterrence strategy.

[29] Cassetti's equation can be said to be based on an argument of Steindl (1979, p. 6), according to which 'a high growth rate and high utilisation will tend to retard withdrawal of equipment … a low growth rate and utilisation will lead to some premature withdrawal of equipment'. Similarly, Allain and Canry (2008) argue that low rates of capacity utilization will lead to more bankruptcies, which entail extensive capital scrapping and hence a reduction of the available capacity. As a result, demand will be spread over a reduced available capacity (that of the surviving firms), thus tending to reduce the discrepancy between measured rates of capacity utilization and their normal value. In addition, as argued by researchers in behavioural economics, normal rates of capacity utilization may act as an attractor. When measures of rates of capacity utilization arise from surveys, there may be a tendency for firms to give answers that do not stray too far from what they consider to be the 'normal' value.

4.3 Goods and labour market reactions stabilise the system II: Firms have multiple targets the realisation of which may be mutually exclusive

Critics of the Kaleckian model (e.g., Auerbach and Skott, 1988; Skott, 2008A; Shaikh, 2007) have repeatedly argued that the normal rate of capacity utilization should be treated as a definite target for firms and that deviations from it should not affect the target itself. Skott (2008A, p. 11) maintains that 'adjustments in the target would only be justified if the experience of low actual utilization make firms think that low utilization has now become optimal'.

As seen above, one response by Kaleckians has been to maintain that firms do indeed take past values of capacity utilization as a reference point for their formulation of the normal rate. However, another line of response to the 'Classical challenge' is possible and has initially been considered by Lavoie (1992, pp. 417-421, 2002, 2003). It has recently been spelled out more explicitly and extended by Dallery and van Treeck (2008). The idea is to treat the normal rate of capacity utilization as a fixed target of firms, while recognizing that firms also have various other important objectives, the realization of which may not necessarily coincide with the realization of the utilization target. Hence, firms need to trade off the utilization rate target with other targets.

Dallery and van Treeck (2008) start out by structuring their discussion of conflicting claims by different stakeholders of the firm in terms of target rates of return. Two conflicts surround the target or 'normal' profit rate. The first conflict involves shareholders and managers, who oppose each others in the determination of the accumulation policies of firms. This conflict arises from the notion of a growth-profit trade-off faced by the individual firm: fast expansion can only be obtained at the cost of lower profitability, due to the costs involved with discovering new products, entering into new markets, etc. (Penrose, 1959; Wood, 1975; Lavoie, 1992, pp. 114-116). As is traditionally assumed in the post-Keynesian theory of the firm (Galbraith, 1967; Wood, 1975), managers mainly seek growth, as a means to ensure the firm's survival by increasing its power and limiting uncertainty. By contrast, shareholders seek profitability, for intuitive reasons. Because they hold diversified portfolios, they are not really committed to the long-term perspectives and the survival of individual firms (Crotty, 1990).

The target rate of return of firms can be derived as a weighted average of the profitability target formulated by shareholders, r_{sh}, and the profit rate, r_{sm}, that corresponds to the growth target formulated by managers, for a given technology and a given growth-profit trade-off. We thus have:

$$(28) \qquad r_{sf} = \delta_1 r_{sh} + (1-\delta_1) r_{sm}, \qquad 0 \le \delta_1 \le 1.$$

Based on these considerations, a general investment function can be formulated:

$$(3F) \qquad g^i = \gamma_0 - \gamma_1 r_{sf} - \gamma_2 \lambda + \gamma_3 u,$$

where the rate of accumulation depends negatively on the debt ratio (λ) and on the rate of return (r_{sf}) being required of firms, and positively on the rate of capacity utilization.

Dallery and van Treeck (2008) consider two polar cases. In the first constellation, shareholders are fully dominant ($\delta_1 = 1$ in equation (3F)) and investment is fully constrained by the shareholders' preference for profitability and by demand conditions ($\gamma_2 = 0$). In the second constellation, managers are fully dominant ($\delta_1 = 0$) and growth is the primary objective, while being constrained by the availability of finance, which is influenced by the debt ratio and by demand conditions ($\gamma_1 = 0$).

The second conflict around the target rate of return involves firms (shareholders and managers) on the one hand, and workers on the other. It concerns the distribution of income between profits and wages. Applying the standard framework for target-return pricing, firms achieve the normal rate of profit, r_n, whenever the rate of capacity utilization is at its normal level, u_n (here assumed to be exogenous). This is clearly seen in equation (1):

$$(1) \qquad r = r_n u / u_n .$$

However, because workers have some bargaining power, firms are not able to incorporate their profitability (or accumulation) target, given by r_{sf}, into prices. Rather, the rate of return actually incorporated into prices, denoted by r_n, results from a compromise between firms and workers. The rate r_n is not the target rate of return of firms; rather it is the rate of profit that firms would manage to achieve if their sales were to correspond to production at the normal rate of capacity utilization. This newly-defined normal rate of profit is given as follows:

$$(29) \qquad r_n = \delta_2 r_{sf} + (1 - \delta_2) r_{sw}, \qquad 0 \le \delta_2 \le 1 .$$

Obviously, it can be seen by inspecting equations (1) and (29) that only one of two targets, either the utilization target, u_n, or the target rate of return of firms, r_{sf}, generally can be achieved, while the other target will not. Sales corresponding to the normal rate of capacity utilization, at $u = u_n$, allow the realisation of the profitability objectives of the firms ($r = r_{sf}$) if and only if there is no conflict over income distribution ($r_n = r_{sf} = r_{sw}$). As soon as workers have some bargaining power ($\delta_2 < 1$) and $r_{sf} > r_n > r_{sw}$, firms have to operate at rates above the normal rate of capacity utilization ($u > u_n$) in order to reach their profitability objective ($r = r_{sf}$).

It should not be surprising that in a complex and conflictual economic system, objectives may not all be realized even in long-run equilibrium.[30] However, it also follows from the analysis above that the profitability (accumulation) target of firms and the income distribution target of workers can be partly reconciled with each other, as long as the rate of utilization is treated as an accommodating variable. The reason for this is that the two profit rates given by r_{sf} and r_n are of a very different nature.

[30] Skott (2008B, p. 10) argues against the adjustment of normal to actual utilization, as discussed in the previous subsection, by means of the following analogy. 'Imagine that over a period I am late for class every day because of a series of minor mishaps (a flat tire one day, followed by a snow storm the next day, road works, a traffic accident at a key intersection, ...). I do not respond to this unfortunate string of events by adjusting my planned arrival time in the way suggested by Lavoie: I may have been late for class (have had too little actual 'commuting capacity') because of unforeseen shocks but that does not make being late seem desirable. In this simple example, nothing prevents me from adjusting my departure time in the direction that I consider optimal (disregarding random shocks; the phone may ring just as I'm about to leave or ...), and by leaving earlier I should get to class on time.' Whatever the validity of this analogy, one may easily imagine a situation where students will adjust, by also arriving late, so that both students and the professor will arrive at the same time. Moreover, it may be that the professor systematically arrives late for class not as a result of minor mishaps or unforeseen shocks, but rather because he or she is prevented from choosing an ideal departure time due to conflicting and equally important objectives, which may be enforced by other individuals.

While the realisation of r_{sf} depends on aggregate demand conditions, r_n can be translated into a profit or wage share that is independent of demand. The aggregate demand constraint results from the combination of equation (3F) with a saving function that incorporates retained earnings, such as equation (2A).

Given our assumption that managers seek to maximize growth, while shareholders are primarily interested in the rate of profit, we may treat $r = r_{sf}$ as the long-run equilibrium condition, and propose two alternative equilibrium adjustment processes:

(30) $\Delta r_{sf} = \rho_1 (r^* - r_{sf})$,

(31) $\Delta s_f = -\rho_2 (r_{sf} - r^*)$.

Equation (30) has been proposed by Lavoie (1992, p. 490). Dallery and van Treeck (2008) have argued that it may be relevant for a manager-dominated firm, where firms maximize growth and 'shareholders play a purely passive role' (δ_1 = 0), as was traditionally assumed in the post-Keynesian theory of the firm (Lavoie, 1992, p. 107). In such a case, when firms observe that actual profitability increases as a result of higher demand, they adjust their target rate of return upwards because a higher profit rate is needed to finance a higher accumulation rate. Throughout this process, firms claim a larger profit share (mark-up), but their preference for higher growth also requires an increase in the rate of utilization, due to real wage resistance by workers. As noted by Lavoie (2002, 2003) and Missaglia (2007, p. 79), the adjustment process described by equation (31) is stable because $dr / dr_s < 0$ as long as the propensity to consume out of wages is higher than out of profits and the economy is wage-led.

By contrast, equation (31), which looks similar to the adjustment process proposed by Shaikh (2007A) (see equation (15) above), may be relevant for the second constellation, namely that of the shareholder-dominated firm (δ_1 = 1). In this case, firms formulate a profitability target (rather than an accumulation target), and shareholders firmly expect this target to be met. According to equation (31), when the actual profit rate is below the target, managers will react by increasing the share of profits distributed to shareholders (dividends, share buybacks), given by (1-s_f), where s_f is the retention rate.[31] An intuitive explanation is that managers aim to support shareholder value and to signal to shareholders that they are confident with regards to the future profit opportunities of firms. As shown by Dallery and van Treeck (2008), this will, under certain conditions,[32] boost the actual profit rate, because of the increased consumption out of profits. In this case, although the rate of profit is a predetermined variable, the utilization rate remains endogenous in the long run.

The main conclusion of this subsection is that in a world where different groups within the firm have different objectives, the equality of actual and normal rates of

[31] Charles (2008) also suggests that the retention ratio of firms should be treated as an endogenous variable. There, managers target some level of the retention ratio in order 'to preserve their financial autonomy' (p. 9). When debt increases, managers cut dividends and increase their retention ratio in order to control uncertainty. In equation (31) above, the causality is reversed: under the pressure of shareholder value orientation, managers are obliged to distribute more dividends by means of increasing debt.

[32] In the presence of strong liquidity constraints, an increase in the distribution of profits may have overall contractive effects and may thus further depress demand and hence profitability, thereby rendering the mechanism in equation (31) unstable.

capacity utilization should not be treated as the (only possible) long-run equilibrium condition. On the contrary, the long-run endogeneity of the utilization rate helps to reconcile the conflicting claims of capitalists and workers. As shown by Lavoie (2002, 2003) and Dallery and van Treeck (2008), the paradox of costs may indeed hold in the type of model discussed in the present section.

5. Conclusions

The purpose of the preceding analysis has been to tackle the issue of the possible instability of the Kaleckian distribution and growth model, as well as the consequences for the paradoxes of thrift and of costs and for the endogeneity of the equilibrium rate of capacity utilization. We have carefully distinguished between Keynesian and Harrodian instability but argued that, at the empirical level, these two problems may be hard to disentangle in practice. Therefore, we have focused on Harrodian instability in our analysis.

Based on a simple Kaleckian model, we have allowed for Harrodian instability, i.e., an increase in the rate of accumulation as long as the actual rate of capacity utilization is above its normal rate. We have discussed various mechanisms, and their objections, that have been proposed to tame Harrodian instability and to bring back the rate of utilization in line with its unique normal rate. We have argued that the Cambridge price mechanism, initially advocated by Nicholas Kaldor and Joan Robinson, is not generally convincing as a stabiliser, because in mature economies – to borrow a label from Peter Skott – lower real wages (or higher profit shares with given technology) bargained by workers and labour unions can hardly square with the low unemployment rates and more powerful labour unions that are associated with utilization rates exceeding the normal rate. A Radical price and distribution mechanism, i.e., rising real wages enforced by strong labour unions, or a price-wage-price spiral, hence Joan Robinson's 'inflation barrier', are more likely. The Radical price and distribution mechanism would bring our model farther away from the 'normal rate', and accelerating inflation would require the introduction of economic policy responses into the model, as proposed in the model by Gérard Duménil and Dominique Lévy.

A careful evaluation of the Duménil and Lévy mechanism, i.e., monetary policies aiming at price/inflation stability which bring back the economy to the normal rate of utilization, however, has shown that this cannot be taken for granted as soon as distribution effects of unexpected inflation and of changes in the monetary policy instrument, the interest rate, are taken into account. In particular the interest rate has an influence both on the actual and on the normal rate of utilization. The normal rate as understood by Duménil and Lévy – a NAICU – is hence affected by the actual goods market equilibrium rate of utilization via monetary policy interventions, and the former becomes endogenous to the latter, albeit in an indirect and complex way. We have argued that this endogeneity can be avoided, if government fiscal deficits are instead applied as an economic policy instrument. However, there may be other forces at work, which make the normal rate endogenous with regards to the actual rate of utilization in an economic policy framework: a horizontal segment in the Phillips curve or the adjustment of the 'normal' to the actual rate via labour-market persistence or other mechanisms. Therefore, the role of labour market institutions and economic policies in the Kaleckian model should be further explored.[33]

Apart from economic policies as a stabiliser in the face of Harrodian instability we have also considered models which suppose that instability is contained or even prevented by the behaviour of capitalist firms. Anwar Shaikh's models either assume that firms increase their retention rate as soon as utilization exceeds its normal rate, thus leading to an increase in the overall saving rate and bringing back the economic system to the normal rate of utilization. Harrodian instability is thus contained. However, the economic rationale for such behaviour is far from obvious. In an alternative model, Shaikh assumes that firms reduce their investment as soon as the expected growth rate of sales exceeds the long-run normal rate. Harrodian instability is hence avoided and utilization is always at the normal rate. However, this kind of behaviour requires rational expectations on the side of the firms – firms have to know the growth rate of sales when making their investment decisions, but this rate is determined by the actual investment rate of other firms. There is thus a coordination problem, which is swept away by Shaikh in this model.

In Peter Skott's models of a 'mature economy', Harrodian instability is bounded by a Marxian labour market mechanism which generates a limit cycle around the steady growth path determined by labour force growth. Capitalists reduce output growth as soon as utilization exceeds the normal rate, unemployment falls, and the unemployment rate approaches some critical value. But this behavioural assumption also lacks plausibility when applied to a decentralised capitalist market economy characterised by competitive pressures. We have hence argued that a Radical income distribution effect or accelerating inflation are the more likely outcomes, and with these stabilisation around a predetermined and unique normal rate is not warranted.

Since the mechanisms that have been proposed to tame Harrodian instability while bringing back the rate of utilization in line with its predetermined normal rate are far from being convincing, we have finally reviewed some approaches arguing that the adjustment towards a predetermined 'normal' rate should not be expected at all. These approaches include the proposition that a fully-adjusted position should not be expected in the real world because expectations and behavioural parameters, as well as norms, are changing so frequently that long-run analysis, defined as fully-adjusted positions at normal rates of capacity utilization, is not a very relevant exercise. Although this may be a vital point, we have argued that in a sense it circumvents the Harrodian challenge. Consequently, we have reviewed how the latter can be dealt with in two other ways that allow for retaining the basic characteristics of the Kaleckian model. The first one is that the firm's perception of the trend rate of growth and of the normal rate of utilization may be path-dependent and hence may be both affected by actual rates of growth and capacity utilization. The second one is that firms may have additional targets, besides the normal utilization of productive capacity, and the realisation of these objectives may be mutually exclusive. The review of these approaches has shown that major results of the Kaleckian model can be retained in a more complex setting than the one provided by the simple textbook model.

Although we do not pretend that our review so far has been exhaustive, we hope to have shown that the summary statements that claim that one may be 'Keynesian in the short run' but needs to be 'Classical in the long run', as Duménil

[33] Recently there has been some work done in this area which can be used as a starting point. See for example Hein and Stockhammer (2007, 2008), Isaac (2008), Rochon and Setterfield (2007), Setterfield (2008).

and Lévy as well as Shaikh argue, are rather premature. It also seems premature to argue, as Skott (2008C, p. 22) does, that 'the current dominance of the Kaleckian model (…) is unfortunate' for post-Keynesian and Structuralist macroeconomics. Kaleckian models are more flexible than the Classical and Marxian critics suppose when attacking the simple textbook version. Deviations of actual from normal rates of utilization and behavioural as well as political responses towards this deviation can be included into these models without necessarily doing away with an endogenous rate of utilization, the paradox of thrift and the paradox of costs in the long.

Of course, these models have to be further developed, as we would also like to insist. Areas of further development should include a more in-depth study of the role of economic policies and labour market institutions. Also, in light of what has occurred since August 2007, financial instability arising from the behaviour of the banking sector should certainly be given more attention. Finally, the role of the growth of labour supply and potential endogeneity channels with regards to the so-called 'natural rate' of growth have to be investigated and the relationship between pro-cyclical profit shares, as observed empirically, and medium- to long-run wage-led aggregate demand has to be clarified.[34]

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[34] Although it should be pointed out at this stage that the introduction of fixed labour in the Kaleckian model, as can be found in Rowthorn (1981), can associate higher real wages and lower mark-ups to higher rates of capital accumulation, higher rates of capacity utilization, and higher profit shares, for some parameter values (Lavoie, 1992, p. 343). Thus a wage-led economy is not incompatible with a pro-cyclical profit share. The importance of fixed labour in the determination of income shares was first underlined by Weisskopf (1979).

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