Neo-Kaleckian and Sraffian Controversies on the Theory of Accumulation

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ABSTRACT *Non-orthodox economists generally share the Keynesian Hypothesis of the independence of investment from capacity savings, in the long run no less than in the short run. This hypothesis marks an essential point of difference from neoclassical theory. Keynes showed that within the limits of the existing capacity utilisation, investment determines savings rather than the other way around. How best to extend this conclusion to the long run is the object of the present paper. The paper assesses the controversy on demand-led growth that has taken place since the mid-1980s between neo-Kaleckian and Sraffian authors. The Sraffian front may be divided into a first and a second Sraffian position, the latter being the Sraffian supermultiplier approach. I shall argue that this second approach is the most promising framework for analysing economic growth.*

1. Introduction

Most non-orthodox economists share what Nicholas Kaldor called the 'Keynesian Hypothesis'—the idea that investment is, in both the long run and the short run, independent of the savings that would be forthcoming from the normal utilisation of productive capacity (Garegnani, 1992, p. 47). Some heterodox economists, however, maintain that the Keynesian Hypothesis applies only to the short run, a position similar to that held by mainstream Keynesian economists. Keynes showed that within the limits of the existing capacity utilisation, it is investment that determines savings rather than the other way around. The outcomes of the capital theory controversy have reinforced this conclusion (Garegnani, 1978–79). How to extend the Keynesian Hypothesis to the long run is the object of the present paper. In particular, I shall assess the theoretical debates on demand-led growth that have taken place since the mid-1980s between neo-Kaleckian and some Sraffian authors

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close to the surplus approach as expounded in the writings of the late Pierangelo Garegnani. Without overstressing the discord, I will distinguish between a *first* and a *second Sraffian position*. The former is mainly sustained by some Sraffian economists at the Third University of Rome; the second, perhaps more accurately described as the Sraffian supermultiplier (*SM*) approach, is supported mainly by a group of Sraffians at the Federal University of Rio de Janeiro. We shall refer to the two positions as the FSP and SM approaches, respectively. The divergence between these two Sraffian outlooks arose in the mid-1990s.

As is well known, the early efforts to deal with the instability problems inherent in the Harrod growth model were based either on the neoclassical factor substitution mechanisms or on the assumption of an endogenously determined income distribution as in the Cambridge Equation; these efforts are considered in Section 3. Both approaches were later rejected by neo-Kaleckian and Sraffian economists, whose writings on the topic (which are discussed in Sections 4 and 5) engendered an intense controversy. Notably, they all took investment as the independent variable. This hypothesis is rejected by *SM* scholars, who take the long-term pattern of the autonomous components of aggregate demand as the independent variable (see Section 6). Their approach was later criticised—not altogether persuasively, as we shall see—by adherents of the *FSP*. The driving role of the autonomous components of aggregate demand sustained by credit creation may be associated with financial crises, as will be noted in the final Section 7, where, additionally, we shall identify potential routes to convergence with other heterodox traditions.

We begin by re-examining two arguments against the treatment of investment as the independent variable in order to avoid Harrod's knife-edge problem.

2. Long-Term Expectations and External Markets

2.1. Eatwell on Keynes and Harrod

John Eatwell (1983, pp. 281–283) has advanced some useful propositions that set the stage for the discussion of the following pages.

- Keynes's notion of effective demand is the macroeconomic counterpart of Adam Smith's notion of effectual demand: the demand that obtains when the product (a single commodity or aggregate output) is offered at normal prices, those associated with a normal profit rate and a normal degree of capacity utilisation, given the real wage rate and the technical conditions of production.
- Capacity utilisation varies over the trade cycle; there is, however, a tendency to adjust capacity to the level of long-period effective demand.
- The process of adjustment of capacity to demand gives rise to some complications: 'Demand has been supposed to be the independent variable, yet the process of adjustment of sectoral capacity to demand must involve changes in investment.... At the aggregate level, this difficulty is manifest in the instability of Harrod's warranted rate of growth. … The origin of the problem is that on the one hand investment is assumed to be the independent variable, whilst on the other hand variation … of investment is the mechanism by which capacity is adjusted to demand' (ibid., p. 282).
- 'The solution may be found in Keynes's own analysis of long-period employment; it is *not* investment which is the independent variable, it is the "state of long term expectations"' (ibid.).

These observations amount to a proposal for an ordered approach to the analysis of economic growth. Eatwell suggests that much of what has gone wrong in the discussion of growth may

be explained by the failure to recognise that 'it is *not* investment which is the independent variable, it is the "state of long term expectations."' But how long-term expectations are formed and, more importantly, how they are revised when economic circumstances change, are questions that Eatwell leaves unanswered.

2.2. Kalecki on Tugan-Say-Harrod and on Luxemburg's External Markets

To my knowledge, it has not hitherto been noticed that Michal Kalecki's masterful 1967 paper on Tugan-Baranowski and Rosa Luxemburg is a contribution on how to overcome the Harrod instability problem. The argument of the paper is well known. Tugan-Baranowski shows that, in principle, a capitalist system can maintain an equilibrium growth path as long as capitalists employ all their savings to create new capital goods. This reflects a distinctive characteristic of capitalism, i.e., that it is a system in which the aim of production is not the satisfaction of human needs, but the generation of profits, which can well be achieved through the production of means of production. A tacit pact could, in principle, be stipulated amongst capitalist to ensure that the entire social surplus, if not consumed, is invested so that all output is sold. But of course, we cannot expect capitalists to follow Say's Law, either blindly or deliberately, since 'capitalists do many things as a class but they certainly do not invest as a class. And if that *were* the case they might do it just in the way prescribed by Tugan-Baranowski' (Kalecki, 1967, p. 152).

Rosa Luxemburg saw more clearly than Tugan-Baranowski the difficulty of capitalists to absorb the social surplus through their own consumption and investment. Hence the necessity of 'external markets'—external to the capitalist income circuit—that might serve to absorb the surplus production. Typically these markets are financed by the capitalist system itself through the financial system (Kalecki, 1934, pp. 15n, 18–19; 1967, p. 153). Kalecki

includes in these markets net exports to the peripheral countries and government spending. We may usefully add consumer credit.

A numerical example used by Kalecki (1967) to illustrate the difficulties with Tugan is implicitly intended to expose the difficulties of Harrod's model. Kalecki assumes an economy in which consumption and investment are the only components of aggregate demand. The rate of net investment in the capital stock is 4% (or 7% in gross terms), at which capacity is fully utilised. If output and aggregate demand also grow at 4%, 'full utilisation of equipment continues and the problem of effective demand does not seem to arise' (Kalecki, 1967, p. 149). But, he asks himself: 'why should capitalists continue to invest at a level of 7 per cent of capital? Simply because the process has been going for some time, this investment has been "justified" and the capitalists … do not hesitate to continue their game' (ibid.). Indeed, he argues, if capitalists for whatever reason decide to accumulate at a rate of only 6%, without increasing their consumption correspondingly, '[t]he problem of effective demand makes then immediately its appearance.… There arises thus a problem of overproduction [that] affects in turn adversely the investment decisions of capitalists' (ibid., pp. 149–150). One might argue that 'this is a typical crisis which will be followed by a period of prosperity. … There is, however, nothing to substantiate this argument. After a breakdown of the moving equilibrium no trace of the 4 or 3 per cent annual long-run increase was left in the economy. The economy may as well settle to a state of simple reproduction with cyclical fluctuations around it' (ibid., p. 150). Kalecki suggests that a Tugan-Harrod model is sustainable only as long as capitalists invest 'as a class' all profits that they do not consume, an untenable supposition.

To escape the Tugan-Harrod knife-edge problem, and to explain why capitalism does not settle into a stationary state, Kalecki suggests that external markets be taken into account as the ultimate explanation of investment. Most of the critical growth literature has so far

neglected this suggestion.[1] Thus, both Eatwell and Kalecki contend that investment should not be taken as the independent variable in growth theory. Notably, at least in his 1967 paper, Kalecki does *not* suggest that the economy might stabilise along a growth path characterised by a below-normal capacity utilisation rate, as the neo-Kaleckians would later do.

In the 1950s two approaches to resolving the Harrod instability problem emerged: Solow's neoclassical growth model and the Post-Keynesian Cambridge tradition associated with Nicholas Kaldor and Joan Robinson. We shall not deal with Solow's model here, primarily because it has been undermined by the results of the capital theory controversy (Cesaratto, 1999, 2010; Cesaratto & Serrano 2002).

3. The Cambridge Equation and its Critics

3.1. The Cambridge Equation

According to the Cambridge equation,

$$g_w = s_c r_n \tag{1}$$

where g_w is the warranted rate of growth (i.e. the rate at which capacity savings grow at a rate equal to the accumulation rate desired by capitalists), s_c is the capitalists' marginal propensity to save (we shall assume throughout this paper that workers do not save), and r_n is the profit rate. The main message of the Cambridge equation is that the warranted growth rate is

[1] The exception seems to be Garegnani's SVIMEZ Report (1962), of which only the first two sections have been published in their entirety (Garegnani, 1978–79). In the portion of the SVIMEZ Report published as part of this symposium, Garegnani (2015) takes 'final demand' as the independent variable. In his view, long-term expectations are the result of a persistent final-demand-led growth rate of the economy. Final demand includes private and government consumption expenditures, net exports and autonomous investment related to technical innovation (by default, the rest of gross investment is induced by the accelerator mechanism). Garegnani also seems to include induced consumption in final demand while, in our view (see Section 6.1.1) only autonomous private consumption (financed through consumer credit) should be included.

determined by the rate of capital accumulation g_k that results from the investment decisions of entrepreneurs; this determines the long-period (or normal) income distribution, which thereby becomes endogenous and subordinated to the rate of accumulation

From an empirical point of view, the association of higher growth rates with a change of income distribution in favour of profits is not particularly robust. If anything, real wages tend to rise during periods of faster accumulation because tighter labour markets lead to an increase in workers' bargaining power. Wages would instead tend to fall during downswings when the 'industrial reserve army' increases. Not surprisingly, both neo-Kaleckian (notably Rowthorn, 1981) and Sraffian authors (notably Garegnani, 1992) have criticised the Cambridge equation approach, primarily on the ground that capitalism can accommodate an upsurge in the rate of capital accumulation by utilising productive capacity more fully through the action of the multiplier, without the necessity of changes in income distribution.[2]

3.2. The Neo-Kaleckian Critique

Following Steindl (1952) and Kalecki (e.g. 1970), Rowthorn (1981, p. 1) explains the underutilisation of capacity by referring to the idea of a 'monopolistic economy which is operating well below full capacity.' In such an economy, 'prices are relatively inflexible and firms respond to a change in demand by varying the amount they produce. When demand is depressed firms respond by reducing the amount they produce, whilst keeping their prices constant. This reduction in output has no effect on real wage rates, but it does reduce both the level of capacity utilization and the rate of profit' (ibid.). Symmetrically, in the case of an investment upsurge, 'there is no need to reduce real wages, and the extra profits required to

[2] It should also be recognised that the Cambridge equation is a demand-led growth model in a limited sense. Although capitalists decide the rate of growth of the capital stock independently of capacity savings, the adjustment of capacity savings does not take place through the variability of output and, in the longer run, of capacity, but through a change in income distribution.

stimulate investment can be generated simply by increasing output and bringing idle capacity into use' (ibid, p. 2). What is more, a fuller capacity utilisation may accommodate higher 'total profits … despite the fact that real wages have increased' (ibid.).

3.3. The Sraffian Critique

3.3.1. The Degree of Capacity Utilisation

Sraffian authors distinguish between full and normal degrees of capacity utilisation. The normal degree of capacity utilisation is related to the expected normal or average effective demand when capacity is originally installed. The main reason why entrepreneurs install additional capacity over average expected output is to be able to meet sudden peaks of demand so that customers need not turn to competitors (Ciccone, 1987, p. 97).

A normal degree of capacity utilisation is an essential feature of the Sraffian *theory of normal prices and distribution*. *FSP* economists are, however, sceptical about a *theory of accumulation* that implies that, on average over significant stretches of time, overall capacity is normally utilised or fully adjusted to effective demand (Vianello, 1985; Ciccone, 1986). How to reconcile the two stances? Assume that in one industry effectual demand—the demand for the commodity at its normal price—increases, so that the market price p_m rises above the normal price p_n. Competition would lead firms in the industry to raise the degree of capacity utilisation to meet the higher effectual demand thus re-establishing p_n. As Ciccone (2011, p. 77) explains, the adjustment of p_m to p_n would take place at an actual degree of capacity utilisation u_a, which is different from the normal degree u_n, so that also the actual profit rate r_a would be different from the normal one r_n. In the meantime capacity will have begun to adjust to the new level of effectual demand, and the rate of profit that firms *expect* on the newly installed equipment is the *normal* rate of profits. Hence, both capital mobility and variation of capacity utilisation mean that the gravitation of p_m to p_n is likely to be a rapid

and effective process, while the normal rate of profits and the associated u_n will be those that prevail 'at the margin', as a guide to the investment decisions of firms. The effective sector-level gravitation of prices and distribution towards their long-period levels would therefore be quicker and less problematic than the system-level full adjustment of aggregate capacity, which is more likely to be frustrated by subsequent changes of long-run aggregate demand. As Ciccone (1986, p. 25) puts it, full adjustment would occur only in a period that is longer than the long period itself. *SM* Sraffians do not object to the supposition that price gravitation is faster than capacity adjustment, although they defend the usefulness of studying 'normal accumulation paths'.

3.3.2. Garegnani's Interpretation of the Cambridge Equation

Garegnani distinguished various meanings of the Cambridge equation. The first, which is equivalent to equation (1), may be written as:

$$g_k = s_c r_n \tag{1.1}$$

in which g_k 'is treated as an independent variable,' implying 'that the incentive to invest … will determine the real wage and the normal rate of profits' (Garegnani, 1992, p. 54). Although Garegnani considers the treatment of g_k as given to be compatible with the Keynesian Hypothesis, doing so would be inconsistent with the classical approach to the theory of distribution. According to the latter, the level of the real wage is not mechanically linked to accumulation and, if anything, would vary in relation to the growth rate in a direction opposite to that predicted by the Cambridge equation. In Garegnani's view, the variability in the degree of utilisation of capacity in the short run and the variability in the level of installed capacity in the long run render the Keynesian Hypothesis consistent with the determination of 'the real wage and the normal rate of profit ... by the circumstances envisaged in the classical theories' (ibid., p. 63). In other words, whereas the Cambridge

equation approach contends that changes in the exogenously determined growth rate are accommodated by a change in factor prices (i.e. income distribution), Garegnani (ibid., pp. 62–63) argues for an alternative approach in which the routine presence of spare capacity 'in a capitalist system make it plausible to think that, in the long period, even more than in the Keynesian short period, autonomous changes in the incentive to invest will usually generate the corresponding amount of savings through changes in output rather than through changes in the real wage rate and normal rate of profits.'

Alternatively, given the normal profit and wage rates, the Cambridge equation can be written as:

$$g^* = s_c r_n \tag{1.2}$$

in which g^* should be interpreted as 'the ratio of saving to capital' associated with a given normal profit rate and a normal degree of capacity utilisation, rather than as a 'rate of accumulation' (Garegnani, 1992, p. 54). Indeed, given r_n, if g^* is interpreted as a rate of growth 'the path of future capital accumulation would be completely determined' (ibid., p. 58), an outcome that is inconsistent with the Keynesian Hypothesis. Equation (1.2) would thus be better interpreted as an accounting identity.

Finally, if instead g is interpreted as the actual growth rate the Cambridge equation would represent a relation between the latter (g_a) and— there being no reason to believe that at g_a the economy will be operating at normal productive capacity—the actual (or *ex post*) profit rate r_a, i.e., the profit rate actually obtained on the installed equipment (Garegnani 1992, pp. 54, 60–62):

$$g_a = s_c r_a \tag{1.3}$$

For Garegnani, of course, an actual profit rate different from normal is perfectly consistent with the prevalence of a normal profit rate 'at the margin', the rate expected on the newly installed equipment and which is uniquely determined once the normal level of the real wage

and the technical conditions of production are given (see also Ciccone, 1986, pp. 33–35). Oscillations in the incentive to invest would affect the realised growth rate of the economy g_a that would thus 'be taken as a measure of the incentive to invest' (Garegnani, 1992, p. 57). Once productive capacity has adjusted to the new 'incentive to invest', Garegnani argues that 'the rate of accumulation *will necessarily be back* to the ratio of capacity savings' (ibid.; my italics). This entails that the long-run 'trend of investment', although it may oscillate, is bound to return to the one suggested by equation (1.2)—even though the latter is dismissed as a (warranted) growth rate since it merely represents the 'ratio of capacity saving' corresponding to a normal degree of capacity utilisation. Moreover, no rigorous demonstration has been provided that this convergence will occur. Given the instability of the Harrodian context adopted by Garegnani it is unlikely that this proof can be provided.

This approach leaves some puzzles unresolved for Sraffian economists. Garegnani (1992) accepts the Harrodian framework. He seems therefore trapped between the Scylla of the Cambridge equation, which is consistent with the Keynesian Hypothesis but inconsistent with classical distribution theory, the empirical evidence and a truly demand-led approach, and the Charybdis of Harrod's model, which is consistent with 'exogenous distribution', but unstable and inconsistent with the Keynesian Hypothesis. Starting from a reasonable scepticism about steady-state analysis, Garegnani (1992, pp. 58–59) indicates a third way, suggesting that normal accumulation paths characterised by a normal degree of capacity utilisation are not representative of capitalist economies, and therefore not a useful object of analysis.[3]

[3] Garegnani's argument is that if we consider two regimes with different rates of growth of aggregate demand, then even if entrepreneurs had perfect foresight, the degree of capacity utilisation over the period that encompasses both regimes and the transition period would not be normal (see also Palumbo & Trezzini, 2003). But this is a deceptive argument, for if we apply it to Solow's model it

Stretching a bit beyond Garegnani's own views, *FSP* exponents (e.g. Palumbo & Trezzini, 2003; Trezzini, 1995, 2011; Smith, 2012) seem to suppose that any steady state necessarily contradicts the Keynesian Hypothesis. They forget that on a steady state-path all cats are grey, so to speak: we cannot clearly identify the causal saving-investment nexus, and national accounting identities are not causal relations.[4] As we have seen, Garegnani does not deny that the steady state advocated by the Cambridge equation is consistent with the Keynesian Hypothesis. So the issue is not that all steady states are necessarily inconsistent with the Keynesian Hypothesis, but that the specific Cambridge equation steady state is inconsistent with classical distribution theory.

4. The First-Generation Neo-Kaleckian Models and the Sraffian Criticism

4.1. The Canonical First-Generation Neo-Kaleckian Model

In order to provide context for our critique, let us recall a standard first-generation neo-Kaleckian model that is still widely used in the debate.[5] The model consists of three equations:

$$g_s = s_c r_a \tag{2}$$

$$g_i = \alpha + \beta(u_a - u_n) \tag{3}$$

$$r_a = \frac{\pi}{v_n} u_a \tag{4}$$

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would lead us to conclude that neoclassical growth theory does not study normal growth paths since variations of parameters lead to different normal paths.

[4] Aside from the Sraffian supermultiplier model, all growth models, including the neoclassical, Cambridge equation and neo-Kaleckian approaches, in equilibrium respect the Harrodian warranted growth equation, though they postulate different causal links between saving and investment.

[5] See Lavoie (2006, p. 114). The model draws upon the seminal contributions of Rowthorn (1981) and Amadeo (1986).

Equation (2), the saving equation, expresses the rate of growth permitted by capacity saving as a function of the saving rate—for simplicity profits are the only source of savings—and of the actual profit rate. Equation (3) expresses the rate of growth of the capital stock as a function of the long-term growth of sales expected by firms (α) and of the gap between actual and normal capacity utilisation under the hypothesis that 'each firm strives to return to normal capacity utilisation' (Lavoie, 2006, p. 115). Equation (4) states that the actual profit rate is a function of the actual rate of capacity utilisation, given the profit share π and the desired or normal capital coefficient v_n.[6] Equation (4) is the profit curve in the bottom part of Figure 1. The unknowns are g, r_a and u_a.

By substituting equation (4) into (2), we get:

$$g_s = \frac{s_c \pi}{v_n} u_a \tag{5}$$

Equations (3) and (5) can be drawn in g-u space, as shown in the top part of Figure 1. The long-run goods market equilibrium is where $g_s = g_i$, that is, equating equations (5) and (3), where:

$$u_a = \frac{\alpha - \beta u_n}{s_c \pi / v_n - \beta}. \tag{6}$$

Equation (6) shows that u_a is the variable that brings the growth of capacity saving into line with the rate of growth of the capital stock.[7] Figure 1 supposes that the initial equilibrium A

[6] Equation (4) is easily obtained from the definition of the actual profit rate: $r_a = \frac{P}{K} = \frac{P/X_f}{\frac{K}{X_f} \cdot \frac{X_a}{X_a}} = \frac{P/X_a}{\frac{K}{X_f}} \cdot \frac{X_a}{X_f} = \frac{\pi}{v_n} u_a$, where P is the sum of profits, X_a is actual aggregate income and X_f is the full capacity aggregate income.

[7] As in all macroeconomic models, the long-run goods markets equilibrium is where the rate of growth of the capital stock is equal to the rate of growth of capacity saving. The Keynesian Hypothesis implies, of course, that outside equilibrium it is the latter that adjusts to the former.

is a Harrod equilibrium in which the economy's plant and equipment are operated at normal capacity; hence $g_w = g_i^0 = \alpha$.[8]

[Figure 1 here]

On this basis, neo-Kaleckian authors extend the Keynesian paradox of thrift to a dynamic setting. Suppose that a rise in real wages causes a fall of the profit share π (Lavoie 2006, pp. 114–119). This causes a rightward rotation of both the g_s and profit curves of Figure 1. At the initial growth rate $g_i^0 = \alpha$, the higher demand for consumption goods leads to a higher degree of capacity utilisation u_a^0 (point B). At the constant growth rate α, the new utilisation rate u_a^0 would need to be such that the realised rate would still be r_n, because with no change in the saving rate, the equation $g_w = s_c r_n$ needs to hold, and hence there would be no change in the realised rate of profit. In practice, the higher rate of extraction of profits out of a given capital stock precisely counterbalances the fall in the profit share, so that the resulting actual profit rate is equal to the initial one. The higher u_a then leads to a higher growth rate of investment—the investment function becomes $g_i^1 = \alpha + \beta(u_a^0 - u_n)$—and to an even higher utilisation rate until a new equilibrium is reached in correspondence with u_a^1 (point C). At u_a^1 the realised profit rate is higher than the initial one. The paradox of thrift would hold in a growth context, since a lower saving rate leads to a higher growth rate.[9]

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[8] At point A, $u_a = u_n$. If we normalise the capacity utilisation rate so that $u_n = 1$, equation (6) boils down to $\alpha = s/v_n$. Bringing us back to Harrod, point A violates the Keynesian hypothesis since α cannot be exogenously determined.

[9] Incidentally, the empirical evidence strongly suggests a *positive* relation between the rate of growth and the saving (investment) rate ($S/X = I/X$) (see Cesaratto, 2010). This is embarrassing for the standard Solow model and, more importantly as regards the present paper, it appears also to undermine the neo-Kaleckian attempt to demonstrate the thrift paradox in a growth context. The puzzle is solved once the autonomous components of aggregate demand are introduced with the

Given this framework, neo-Kaleckians speak also of a 'paradox of costs': 'A higher real wage, and therefore higher costs of production, leads to a higher long-period [actual] profit rate. In other words, a *reduction* in the gross costing margin of each individual firm ultimately leads to a *higher* [realised] profit rate for the economy as a whole' (Lavoie, 2006, p. 117; my insertions in square brackets). The possibility of wage-led growth appears to be in sharp contrast not only with the Cambridge tradition's inverse relation between real wages and growth rates, but also with the classical economists' inverse relation between real wages and the normal profit rate.

4.2. What is Actual is Normal: the 'New Normal'

Assume we are at point C in Figure1. From equation (6) we get: $\frac{s_c \pi}{(v_n / u_a^1)} = \alpha + \beta(u_a^0 - u_n)$

or, given that $s = s_c \pi$ and $v_a^1 = v_n / u_a^1$, $\frac{s}{v_a^1} = \alpha + \beta(u_a^0 - u_n)$.[10] Suppose that capitalists consider the degree of capacity utilisation corresponding to C to be the 'new normal', that is $u_a^1 = u_{nn}$. We might then redefine the actual capital coefficient v_a^1 as the 'new normal' capital coefficient $v_a^1 = v_{nn} = \frac{v_n}{u_a^1} = \frac{v_n}{u_{nn}}$, and obtain a warranted growth rate equal to $g_w = \frac{s}{v_{nn}} = \alpha + \beta(u_a^0 - u_n)$. The growth rate is determined by the 'animal spirits' of entrepreneurs (α) in combination with their ceaseless effort to restore the 'old normal'

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ensuing distinction between the marginal (s) and the average (S/X) propensities to save. It will be shown in Section 6 below that while a lower s has a positive *level* effect on output, a higher growth rate is necessarily associated with a higher S/X.

[10] Recall that, in general, $v_a = \frac{v_n}{u_a} = \frac{K / X_f}{X_a / X_f} = \frac{K}{X_a}$.

utilisation rate u_n; as suggested by Hein, Lavoie& van Treeck (2012, p. 144), however, the latter effort becomes a stable component of the growth rate that might usefully be redefined as $\alpha^1 = \alpha + \beta(u_a^0 - u_n)$ so that $g_w = \alpha^1$.

There are serious consistency problems here, however. As noted before, the initial equilibrium A of Figure 1 is a Harrod equilibrium, i.e. α is the only growth rate consistent with normal capacity utilisation ('normal growth'). So abandoning the concept of normal growth is essential in order for the neo-Kaleckians to sustain the Keynesian Hypothesis. But we see now that they cannot abandon it completely if they want to demonstrate the thrift paradox, which entails going to point C. The equilibrium at C, however, will be lasting only if some reason exists to take u_a^1 as the 'new normal' rate of capacity utilisation u_{nn}.[11] But then, why should capitalist want to recover the old u_n? The problem is that if they don't, the term $\beta(u_a^0 - u_n)$ would disappear from the investment function and the economy would return to point B, with the consequence that the thrift paradox is not demonstrated. So the neo-Kaleckians must at the same time maintain that while at C capitalists redefine a 'new normal' utilisation rate $u_a^1 = u_{nn}$, at the same time they still want to fill the gap $(u_a^0 - u_n)$. On the other hand, if capitalists do not consider u_a^1 to be the new normal the economy will be led to points D, E etc, as we shall shortly see.

[11] Some rationalisations for the endogenity of u_n are suggested by Hein, Lavoie & van Treeck (2011, 2012). Not very persuasively, they refer to 'provisional', 'conventional' or even 'aspirational' notions of the degree of capacity utilisation.

4.3. The Stability Issue

Hein, Lavoie & van Treeck (2012; see also Lavoie 2003) are aware of the problems and note that once the term $\beta(u_a - u_n)$ is introduced into the investment function (3) the Harrod instability problems resurface.

Figure 1 elaborates Hein and his co-authors' own presentation of the instability dynamics (ibid., Figure 5). The economy starts from point A where $g_s^0 = g_i^0$ and $g_i^0 = \alpha$. As before, we assume that at A u_n and r_n prevail (which is to say that a Harrodian warranted rate rules there). After a decrease in the propensity to save, the g_s function shifts downwards and the economy provisionally goes to B. At B the higher demand for wage goods is satisfied by a higher u_a, while the growth rate is still $g_i^0 = \alpha$. Supposing that capitalists try to restore u_n, the economy moves towards a new investment function $\mathrm{g_i^1} = \alpha + \beta(u_a^0 - u_n)$ to reach point C. Following the suggestion of Hein, Lavoie & van Treeck (2012, p. 144) that 'entrepreneurs … make a new, higher, assessment of the trend growth rate of sales, thus making use of a larger α parameter in the investment function', at point C the new investment function becomes $\mathrm{g_i^2} = \alpha^1 + \beta(u_a^1 - u_a^0)$, where $\alpha^1 = \alpha + \beta(u_a^0 - u_n)$, and a new provisional equilibrium is reached at D. There, though, a new investment function $\mathrm{g_i^3} = \alpha^2 + \beta(u_a^2 - u_a^1)$ prevails, where $\alpha^2 = \alpha^1 + \beta(u_a^1 - u_a^0)$, and so on and so forth.

As we have noted, the neo-Kaleckians would like to locate their 'new normal' growth path at C. But if we suppose that entrepreneurs interpret whatever the rate of capacity utilisation happens to be as the 'new normal', we would be begging the question of why they have not taken u_a^0 (corresponding to point B) as the 'new normal', that is $u_a^0 = u_{nn}$; on the other hand, if we take $u_a^1 = u_{nn}$ then the adjustment term $\beta(u_a^0 - u_n)$ would disappear from the investment function and the economy returns to point B. If the economy stops at B, then a fall in the saving propensity would have no effect on the growth rate, that is, the thrift

paradox would not have been proved in the dynamic context. However, if capitalists do not assume $u_a^1 = u_{nn}$ and we allow them to adjust capacity to restore the 'old normal' u_n, there is no reason why they should stop at C, or D etc.[12]

In summation, the neo-Kaleckians acknowledge that once adjustment of capacity is allowed, Harrod instability does reappear (the economy would move to C, D, etc). To avoid instability, they introduce the ad hoc assumption that entrepreneurs take the actual degree of capacity utilisation as the 'new normal'. A second ad hoc device, to demonstrate the paradox of thrift, is to assume, without justification, that entrepreneurs select u_a^1 (point C) and not u_a^0 (point B) as the new normal.

Finally, let us provide an economic explanation of the neo-Kaleckians' contortions. These are due to the fact that wages are an *induced* component of aggregate demand, and as such they cannot be the *primum movens* of growth. By creating a never-resolved discrepancy between u_a and u_n, however, a rise of real wages may affect growth; but the weakness of the trick is patent. (Compare this result with the effect of a rise of real wages in the Sraffian supermultiplier context in Section 6.1.4 below).

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[12] Ciampalini & Vianello (2000) have put forth a parallel critique looking at capitalists' behaviour from the point of view of the profit rate. Suppose for instance that the economy settles at C in Figure 1. In the neo-Kaleckians' view the realised profit rate, e.g. r_a^1, is the rate expected on new investment, as if entrepreneurs never realise that this higher realised profit rate depends on the current overutilisation of capacity. This amounts to supposing that investors exhibit a sort of Faustian behaviour: 'The thesis according to which the expected profit rate is governed by the realised profit rate presupposes … that every time existing capacity is over- or underutilised—and a profit rate higher or, respectively, lower, than the normal one is therefore obtained—investors would expect that the productive capacity they plan to install will also end up being over- or underutilised. But to attribute to investors such an expectation is to … consider them to be victims of an irremediable interior discord, which induces them to plan to put in place a certain productive capacity and, at the same time, not consider it adequate to their wishes. "*Two souls, alas! reside within my breast; and each withdraws from and repels its brother*"' (Ciampalini & Vianello, 2000, p. 383; my translation).

4.4. The Inconsistent Trinity

As seen above, there is a *prima facie* convergence between the neo-Kaleckian and *FSP* critiques of the Cambridge equation. This junction is, however, reached through two different routes: via steady-state models without normal capacity utilisation by the neo-Kaleckian authors; or, with the *FSP* supporters, by rejecting steady-state analysis. Echoing earlier criticism (e.g. by Auerbach & Skott, 1988, and Committeri, 1986), Trezzini (2011) deems the first position to be unsustainable since the adoption of the steady-state method would lead to an inconsistent association of a *given* actual growth rate with a *systematic*, persistent degree of under- or overutilisation of capacity. According to the *FSP* authors once the straitjackets of steady-state analysis are abandoned, a long-run average utilisation different from normal, far from being inconsistent with long-run analysis, would be a manifestation of the independence of investment from capacity saving.

In summation, we may draw the inconsistency growth triangle (Figure 2) defined by the three corners: (i) the Keynesian Hypothesis of investment independent of exogenously given capacity saving; (ii) the classical supposition of an exogenously given income distribution; and (iii) a long-run normal degree of capacity utilisation.

To resolve the inconsistency, the various approaches examined so far discard, respectively: angle (ii) according to the Cambridge equation supporters; and angle (iii) according to both neo-Kaleckians—who heroically retain steady-state analysis—and to the *FSP* (and Garegnani, 1992) who, however, more consistently have abandoned the investigation of normal accumulation paths. We shall see below that a 'fourth way' is taken by the Sraffian *SM* scholars by discarding the Harrodian context that underlies the trilemma.

[Insert Figure 2 here]

5. Accumulation and the Profit Rate

Sraffians closer to the surplus approach tend to share the idea that gross investment is determined by expected effective demand. Variations of the normal rate of profit, as such, have no direct and mechanical influence on gross investment, as is often argued by Post-Keynesian authors of various persuasions.[13] Hence, variations of r_n only concern the sphere of income distribution. The latter can in turn influence investment decisions in two broad ways. First, a change in distribution might affect expected effective demand: a higher or lower r_n might, for instance, negatively or positively affect consumption demand to the extent that the latter is sensitive to changes in the real wages. Second, changes in distribution can have an impact on investment in so far as they trigger within the capitalist class a greater inclination to constrain the bargaining power of workers by regulating the reserve army of labour; but this is generally accomplished through fiscal, monetary and exchange rate policies and not through a coordinated set of decisions among capitalists to alter the rate of accumulation.[14]

There is, accordingly, no reason to suppose that an increase in r_n would have a positive effect on investment. Likewise, a lower r_n will, in general, leave gross investment unaffected as long as capitalists fear the loss of market share to competitors: each capitalist is *homo homini lupus* with respect to her classmates. As Serrano (2006, p. 14) observes:

> although politically entrepreneurs prefer higher profit margins and normal profit rates, capitalists do not 'invest as a class' but according to the existing investment opportunities and the pressure of competition. Their investment decisions are *not* an

[13] I have in mind here Sraffian authors such as Serrano (2006) and Petri (1994). Other Sraffian economists, e.g. Vianello, hold somewhat different views, as we shall see.

[14] For instance, the 'independence' of central banks is nothing other than an assignment to a 'super-partes' institution the role of watchdog of wage discipline. The most striking example is the Bundesbank (Cesaratto & Stirati, 2011).

> inverse function of the level of the normal rate of profits but a positive function of the size of the market. In the long run the size of lucrative investment opportunities depends on the level and rate of growth of effective demand—the demand of those who can pay normal prices (that price that allows firms to obtain the normal rate of profits, which defines the minimum accepted standard of profitability). If effective demand is expanding, whether normal profit margins and rates happen to be 'high' or 'low', competition and the search for maximum profits impel the firms collectively to expand productive investment.

Sraffian authors also reject the idea that a higher normal (or realised) profit rate might positively affect investment through the higher internal availability of funds. Garegnani (1962, p. 91, fn. 1) observes that it is investment that, in the short run, through a fuller utilisation of capacity and, in the long run, through the creation of new capacity, determines saving (including retained profits) and not the other way round. In addition, as Ciampalini & Vianello (2000, p. 391; my translation) point out: while 'the availability of internal financial resources can well enable [a firm] to undertake an investment that presents a sufficient inducement, [it] certainly does not compel the undertaking of investment in the absence of an inducement.'

In the light of what has been said in Section 3, much confusion has been shown by neo-Kaleckian authors with regard to the relation between actual and normal profit rates. In this connection, Garegnani rejects the neo-Kaleckian interpretation of the post-war capitalist 'golden age' of capitalism as a wage-led regime in which the interests of capitalists and workers were aligned (Cavalieri, Garegnani & Lucii, 2004). In Garegnani's view, the profit rate relevant for capitalists is not the *ex post*, realised one, but the *ex ante*, normal one, i.e. the rate they expect to earn on newly installed equipment. A rise in the real wage rate, given the techniques in use, must lead to a fall in the normal profit rate. It is possible that in certain historical circumstances capitalists acquiesce to such a fall without resorting to economic policies aimed at enlarging the industrial reserve army; but in these circumstances we should

talk of a *compromise* between clashing interests rather than of *coincidence* of interests. For comparison, in two influential contributions Stephen Marglin and Amit Bhaduri (Bhaduri & Marglin, 1990; Marglin & Bhaduri, 1990) express similar scepticism towards the cooperative vision of capitalism put forth in the neo-Kaleckian literature, but their criticism is predicated on the supposition that a fall in the normal rate of profit might have a negative impact on investment. But, as Serrano (2006, p. 13) points out, Marglin & Bhaduri perpetrate a confusion when they 'mechanically try to associate the squeeze in profit margins to a reduction in pace of investment by arbitrarily assuming that investment is a direct function of the level of the profit share. The fact that lower profit margins lead to lower normal rates of profit does not imply that the most lucrative option in this situation will be a reduction of investment and the size of productive capacity. The adequate size of productive capacity does not depend on the level of the normal rate of profit but on the size of the demand of those who can pay the prices that guarantee that the minimum normal profitability requirement is met, irrespectively [of whether] this normal rate is high or low.'[15]

If real wages rise and the normal profit rate falls, capitalists would of course be disappointed and would desire the restoration of the former profit rate. This task is likely to be left to the economic policies of pro-capitalist states since, from the point of view of each capitalist, the decision to reduce investment and leave forthcoming demand unsatisfied would entail the risk of opening a market opportunity to competitors. For this reason, although a fall in the normal profit rate may affect the general policy stance and, *therefore*, investment, this does not involve a general inverse association between r_n and the pace of accumulation in the *sphere of investment decisions*. When we deal with accumulation theory it is better to regard investment as determined by expected effective demand at the given normal profit rate,

[15] Vianello (1989), Ciampalini & Vianello (2000) and Pivetti (2015), referring to Marx, maintain that a lower normal profit rate discourages investment.

whatever it is, leaving the effects on accumulation due to changes in income distribution and policy stance to a different analytical stage.

6. Growth with Autonomous Components of Aggregate Demand

6. 1. The Supermultiplier

6.1.1. The Neglect of Autonomous Demand

The 'strict uniqueness' and instability of Harrod's warranted growth rate are problems that need to be resolved. By 'strict uniqueness' I mean that the variables that enter into the warranted growth rate are necessarily inconsistent with an independent determination of long-run aggregate demand. Once we rule out the endogenous change in income distribution envisaged by the Cambridge economists, in the equally unsatisfactory neo-Kaleckian and *FSP* approaches, the degree of capacity utilisation becomes the adjusting variable. If we could show the existence of a multiplicity of normal or warranted demand-led growth rates, we will have taken a significant step towards overcoming the Harrodian 'strict uniqueness' problem, the odd neo-Kaleckian steady states and the *FSP* abandonment of normal accumulation paths. This I call the *existence* problem.

Serrano approaches this question by noting the surprising neglect of the autonomous/non-capacity-creating components of aggregate demand in the Post-Keynesian literature. These autonomous components, which we shall denote by *Z*, are defined as those that (a) do not depend on actual or expected income (as induced consumption and induced investment do) and (b) do not create capacity. The neglect is all the more surprising in view of the role that government spending plays in Keynes's *General Theory* (1936) and 'external markets' in the writings of Kalecki (1934, 1967). Reviving Eatwell's criticisms noted in Section 2.1 above, Serrano (1995, p. 97) points out that, indeed, in all 'Post-Keynesian theories of growth, the long-period version of the principle of effective demand is seen as

being essentially a proposition about investment. … [I]nvestment is the key independent variable.' Investment is often explained by invoking 'animal spirits' or Schumpeterian competition.[16] Leaving aside the vagueness of such explanations, the conceptualisation of investment as *autonomous* appears inconsistent with its *induced* nature, as the adjusting force of capacity to demand. The way out proposed by Serrano consists of three steps:

(i) Model investment as fully induced:

$$I = v_n g^e X_n \tag{7}$$

where X_n is the normal level of output and g^e is the expected rate of growth of effective demand.

(ii) Take account of the autonomous/non-capacity-creating components of aggregate demand (Z).

(iii) Anchor the formation of expectations regarding long-term demand (g^e) to the growth rate (g_z) of those autonomous components; the idea is that this anchor permits a progressive adjustment of expectations to g_z.

6.1.2. Assumptions and Preliminaries

Serrano (1995, p. 18–24) simplifies the economy along Kaleckian lines, adopting the dictum that 'capitalists earn what they spend while workers spend what they earn.' The simplifications are not essential to the model, but are intended to emphasise the distinctive traits of a capitalistic economy.

Look at capitalists first. Serrano assumes that workers do not save while capitalists save all their earnings, so the marginal propensity to save of capitalists is $s_c = 1$. The overall

[16] Dennis Robertson (1915, p. 9) and Garegnani (1978–79, p. 347) advance similar criticisms of the treatment of expectations in purely psychological terms; they favour an approach based on real economic circumstances. The Schumpeterian view is criticised in Cesaratto (1996).

marginal propensity to save is then $s = s_c\pi = \pi$, where $\pi = P/X_n$ is the profit share in normal output X_n. The supposition that $s_c = 1$ does not imply that capitalists do not consume: at the beginning of the period considered, they consume all they wish (perhaps financing their consumption by using overdraft facilities). The capitalists' spending is thus comprised of their autonomous consumption (Z) and their investment decisions, induced *during the period* by expected demand according to the accelerator principle as reflected in equation (7). Although at the end of the period capitalists do not spend all their accrued profits, not all their earnings consist of saving since part are offset by their autonomous consumption Z, which is dissaving.

Look now at workers. To simplify, we assume they have no access to credit and simply spend what they get, so that the economy's marginal propensity to consume is equal to the wage share of income wl (given that capitalists have a marginal propensity to consume equal to 0), where w is the given real wage and $l = N/X_n$ is the labour input coefficient.

Given the wage bill W, profits are equal to $P = X_n - W = Z + I$, and saving to $S = s_cP - Z = P - Z = I$. Recalling that $s = s_c\, P/X_n$, saving is equal to $S = -Z + sX_n$, we get:

$$\frac{S}{X_n} = s - \frac{Z}{X_n} \tag{8}$$

Equation (8) expresses the average propensity to save of the economy as the difference between the marginal propensity to save (profit share) and the share of autonomous consumption in output (share of dissaving). As Serrano (1995, p. 126) explains: 'whenever we take into consideration the presence of autonomous expenditures, as we do in our Sraffian supermultiplier, there simply cannot be any univocal and direct relation between the distribution of income and the share of savings in the economy, even if all saving comes from profits.'

6.1.3. Income Determination and the Limits of Demand-Led Growth

Aggregate demand is defined as $AD = Z + I + C$, or $AD = Z + v_n g^e X + wlX_n$, and, following the principle of effective demand, $X_n = AD$. From this, the Sraffian supermultiplier determination of output can be derived:

$$X_n = \frac{1}{(1 - wl) - v_n g_z} Z \tag{9}$$

In equation (9) we are provisionally assuming that firms form their growth expectations and investment decisions on the basis of a known rate of growth of Z: $g^e = g_z$. Equation (9) suggests that the growth of 'external markets', as reflected in Z, governs the rate of growth of aggregate demand and output. With a little manipulation, we can rewrite equation (9) as $\pi X_n = Z + v_n g^e X_n$ to show that in the model capitalists 'earn what they spend'.

Equation (9) provides economically meaningful solutions if:

$$wl + v_n g_z < 1 \tag{10}$$

and

$$Z > 0 \tag{11}$$

Serrano offers a double interpretation of these conditions (see also Dejuan, 2005, p. 240n). To begin with, he observes that if the equality sign prevailed, then the only equilibrium rate would be $g^e = \frac{s}{v_n}$, and we are back to Harrod's model and Say's Law, since there would be no room left for the autonomous components of aggregate demand; Z should then be set equal to 0. In other words, if $wl + v_n g_z = 1$, this means that the overall marginal propensity to spend is equal to one, which 'is exactly what we mean by Say's Law' (Serrano, 1995, p. 37). Of course, if the overall marginal propensity to spend is lower than one, the level of the autonomous components must be positive, as set by equation (11).

6.1.4. Investment and Saving Shares

Rewriting condition (10) as $g^e < \frac{s}{v_n}$, Serrano envisages a further limit to demand-led growth: g_z (and g^e) cannot be 'too high', otherwise the share of induced investment will also be 'too high' and we breach 'the upper limit of feasible rates of demand-led capacity growth' (Serrano, 1995, p. 40). To see this, note that from the investment function (7) we get $I / X_n = v_n g^e$. That is, comparing two normal paths, the one with a higher g_z (and g^e) requires not just a higher rate of growth of investment (g_k), but also a higher share of investment in current normal output: 'given the capital-output ratio, a higher rate of growth of capacity will necessarily require that a higher share of *current* level capacity output be dedicated to capacity-generating investment' (Serrano, 1995, p. 32). A positive relation between the rate of growth and the investment share *I/X* is a widely recognised stylised fact of economic growth. This does not mean that higher growth requires a fall in consumption—the Samuelsonian trade-off between butter and guns: on the new normal path, capacity X_n has risen enough to accommodate both the larger *share* of induced investment required by the higher g_z and a larger absolute level of both induced and autonomous consumption.[17]

In the *SM* context, it can be shown that, given the exogenous levels of Z, g_z, s and v_n, a level of X exists such that $\frac{S}{X_n} = \frac{I}{X_n}$ and the economy grows along a normal path $g_w = g_z$.

[17] Serrano allows both a short-period adjustment of capacity savings to higher investment through a higher degree of capacity utilisation, and once the maximum capacity has been reached, a Cambridge equation style adjustment: 'what the maximum rate of growth says is that capacity output cannot grow faster than that rate if the degree of utilization is to be kept at its "planned" or normal level. That means that both actual output and also capacity can grow a bit faster at least for a while, to the extent that there are always planned margins of spare capacity. For very high rates of growth of demand such that neither capacity nor output can respond fast enough the result will be demand inflation and "forced saving" in a way similar to the Cambridge theory of distribution' (1995, p. 44n).

This would represent a step forward with respect to the inflexible Harrodian context in which the given s and v_n determine a strictly unique warranted path. By taking the autonomous components of aggregate demand into account, a range of normal growth paths is in principle feasible, each one defined, given s and v_n, for certain levels of Z and g_z. Observe that the autonomous components (which in general include government spending and exports) are also instrumental to demand-side policies whose role is concealed in investment-driven models.

The presence of the autonomous components of aggregate demand entails a distinction between the marginal and the average propensity to save; see equation (8). Serrano's idea is precisely that through the operation of the supermultiplier, the level and growth of Z will generate a level of productive capacity such that the *average* propensity to save $\frac{S}{X_n}$ is able to accommodate any level of induced investment at a normal degree of capacity utilisation. Note first that, given that in equilibrium $S = I$, and recalling that $\pi X_n = sX_n = Z + I$, equation (8) can also be re-expressed as: $\frac{S}{sX_n} = \frac{I}{I+Z}$, that is $\frac{S}{X_n} = \frac{I}{I+Z}s$, or

$$\frac{S}{X_n} = s_P s \tag{12}$$

Equation (12) expresses the average propensity to save as a function of s and of s_p, what Serrano (1995, p. 126) calls the 'fraction', the share of profits which is invested. Let us now derive the *SM*'s warranted growth rate.

6.1.5. Serrano's Warranted Rate

In line with previous models, we have a three-equation system:

$$S = sX_n - Z \tag{13}$$

$$I = v_n g^e X_n \tag{14}$$

$$S = I \tag{15}$$

Substituting equations (13) and (14) into (15) and assuming that $g_e = g_z$, we get:

$$g_z X_n = \frac{sX_n - Z}{v_n}, \text{ or}$$

$$g_z = \frac{s - (Z / X_n)}{v_n} \tag{16}$$

Taking advantage of equation (12), equation (16) can be expressed as:

$$g_z = s_p \frac{s}{v_n} \tag{17}$$

The normal path that assures the dynamic saving-investment equilibrium can finally be written as:

$$g_w = \frac{(S / X_n)}{v_n} \tag{18}$$

Equation (18) shows that the variations in S/X_n accommodate g_w to the variations of g_z: the normal rate adjusts to the actual (Serrano, 1995, pp. 124–129).[18] Let us consider the economics behind this adjustment.

Looking at this through the lens of equation (16), if g_z increases, given s, then Z/X_n must fall. This is so because along a normal growth path investment must precede the growth of demand: equipment must be in place when demand rises so as to assure normal capacity utilisation. So if g_z increases, on the new normal path the ratio I/X_n must be larger and the ratio Z/X_n lower, given s. Since the share of consumption in normal output is constant—it is in fact equal to the wage share, which is also constant—then in the new steady state by necessity the higher share I/X_n is accommodated by a lower Z/X_n. This is possible since in any period along a normal growth path, for the same given level of Z, a (say) higher expected g_z is associated

[18] By comparison, according to the neo-Kaleckians the actual rate becomes the ‘new normal’.

with a higher level of normal output X_n—not surprisingly since a higher g_z implies higher current investment—such that it generates a share of capacity savings S/X_n adequate to the higher level of investment required by the higher g_z.

Similarly, equation (17) suggests that a higher g_z, given s, implies a higher $s_p = I/(I + Z)$, that is, that on the new normal path a larger share of profits is invested. The idea is again that a higher g_z for a given Z, implies higher current I, X_n and level of profits. Therefore the fraction of profits invested (and *post factum* saved) can therefore rise.[19] We see here that we cannot know the actual share of saving in income only by looking at the marginal propensity to save (equal here to the profit share), since the former depends on the share of profits which is invested, and this depends on the expected rate of growth (Serrano, 1995, p. 126).

Summing up in Serrano's own words, equations (16) and (17) establish

> that the operation of the supermultiplier will always generate the required share of [capacity saving], not by changing [in the long run] the degree of utilisation but by changing the level of investment [and normal output] by more than consumption (inclusive of autonomous expenditure) and therefore through changes in the ratio between the (endogenous) average and (the given) marginal propensity to save. … The idea that such an adjustment was impossible is not a general result and depends entirely on the fact that if there are no autonomous expenditures then, as we have seen, it is simply impossible, irrespectively of how much the level of investment changes, to change the ratio between investment and output which is given uniquely by the marginal propensity to save. (1995, pp. 58–59) [20]

[19] In a nice example Serrano (1995, pp. 131–132) compare two economies that at a certain point in time have the same level of autonomous/non-capacity-generating expenditure. Assume, however, that one economy is stagnating with no net investment while the other is on a normal path led by a positive growth rate of autonomous demand g_z. It is plain that the second economy will have a larger 'fraction' s_p. Suppose $Z = 100$, $s = 0.5$, $v_n = 2$, and $g_z = 0.05$. Then $X = 250$ and $s_p = 0.2$. If $g_z = 0.02$, then $X = 217$ and $s_p = 0.08$.

[20] Serrano (1995, p. 75) seems to acknowledge that he is discussing an existence problem when he argues that through the supermultiplier 'we have shown how the existence of a definite level of

Note that, in contrast to what we find in the Cambridge equation, here the profit share (equal to the marginal propensity to save) and the normal profit rate need not change when g_z changes; nor, on the new normal path, must the degree of capacity utilisation be different from normal as argued by the neo-Kaleckians. In conformity with Garegnani's insight, the variable that accommodates capacity saving to the level of investment required by the growth of Z determined by the spending decisions of capitalists is productive capacity: this is assured by the working of the supermultiplier.

A comparison with the neo-Kaleckian wage-led growth model is also in order here. In the Sraffian supermultiplier framework, an increase in real wages, and the consequent lower profit share and marginal propensity to save, have positive *level* effects, but not the *growth effects* alleged in the unconvincing neo-Kaleckian arguments (Serrano, 1995, pp. 134–137). The lower marginal propensity to save ($1 - wl$) will increase the value of the supermultiplier in equation (9) and hence also the level of induced consumption-sector investment, leading to a higher long-period level of productive capacity. The rate of growth may therefore rise temporarily, but once capacity has adjusted to the new higher level of effective demand entailed by the larger supermultiplier, the economy will return to the former normal growth rate determined by the growth rate of autonomous expenditure.

What has been said so far has to do with an existence question, but it still leaves open the question of *stability*, that is, the question of what happen during the transition from one normal path to another: can we be sure that the faster growth of investment and the above-normal degree of capacity utilisation stimulated by a higher growth rate of autonomous

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capacity output determined by effective demand requires two conditions, namely: a) that the economy's marginal propensity to spend be lower than one; and b) that there is a positive level of autonomous expenditures that is both independent from income (output) and does not generate capacity.'

demand does not go out of control in a Harrodian fashion? Another limitation is that we have proved the existence of a warranted rate by assuming that entrepreneurs have perfect foresight about g_z (we assumed $g^e = g_z$). Nonetheless, the fact that we have now a range of normal growth paths, each defined for a given g_z, makes it possible to talk of a variety of paths corresponding, say, to different economic regimes and to the related economic policies for overcoming Harrod's 'strict uniqueness' problem. Each warranted rate is consistent with a classical approach to distribution (i.e., distribution is exogenous) and with a long-run normal degree of capacity utilisation. The task is to prove analytically that gravitation will occur, moving the economy from one path to another, each path being characterised by a different growth rate of *Z*—which, of course, is unknown to the entrepreneurs (this is discussed in Section 6.4).

6.2. Synthesis: Comparing Normal Paths

Before we come to the matter of stability, it may be helpful to summarise the differences between the four approaches to growth theory we have been discussing.

- *Harrod:* $g_w = (s/v_n)$

  The equilibrium growth path is characterised by 'strict uniqueness' and instability. Economic policy may stimulate growth by increasing *s* and keep instability at bay through economic planning (not a good *positive* theory).

- *The Cambridge equation:* $g_w = \alpha = r_n s_c$

  Changes in r_n provide flexibility and stability whenever 'animal spirits', the unexplained origin of growth, change.

- *The neo-Kaleckian model:* $g_w = \alpha + \beta(u_a - u_n) = s/v_{nn}$ or $\alpha^1 = s/v_{nn}$ where v_{nn} is the 'new normal' capital coefficient.

  A flexible u_a provides the necessary cushion against the instability due to changes in 'animal spirits', the unexplained origin of growth; no clear role for economic policies (but support to cooperative capitalism).

- *The Sraffian supermultiplier:* $g_w = g_z = \dfrac{(S/X_n)}{v_n}$

  The endogeneity of *S/X* provides flexibility with respect to changes of g_z; the autonomous, non-capacity-creating components of aggregate demand explain economic growth; economic policy, by acting on them, may stimulate growth.

6.3. The FSP Critique of the Supermultiplier

We present here three *FSP* critiques of the supermultiplier approach.

(i) As mentioned, *FSP* supporters appear to maintain that *any* growth model with normal capacity utilisation, including the supermultiplier framework, would violate the Keynesian Hypothesis. Of course, given an initial capital stock (and s and v_n), if we *pretend* that the economy proceeds along a steady-state growth path, then investment must equal capacity saving, and there is only one growth rate of autonomous demand consistent with this long-period position. But no supermultiplier theorist would argue in these caricatured terms. Trezzini (1995, p. 49ff) does seem to acknowledge that the correct question is this: given s, v_n, the capital stock and a long-run growth rate of autonomous demand g_z that is unknown to entrepreneurs, will the economy tend to a normal growth path $g_w = g_z$ characterised by a normal degree of capacity utilisation? Once the economy converges to a normal path, it is a matter of national accounts that investment is equal to capacity saving. What is relevant from

an analytical point of view is that in the process of gravitation to the long-run position it is capacity savings that adjusts to investment, consistently with the Keynesian Hypothesis. A full understanding of this point would drastically reduce the distance between the two Sraffian positions.

(ii) A clear requirement for the stability of the supermultiplier is that any growth rate of autonomous/non-capacity-creating demand must have a sufficient degree of persistence. Despite the scepticism of Palumbo & Trezzini (2003), the supermultiplier appears to be a useful tool for analysing not only historical periods in which g_z and long-term expectations are relatively stable, but also more erratic phases in which, nevertheless, the pattern of autonomous demand acts as a temporary attractor. As Dejuan (2005, p. 244) sensibly puts it, even if 'the pace of autonomous demand is not so stable, the adjustment might never be completed and capacity would rarely be fully used. However, even in these conditions we are in the realm of a long-period theory of output since the economy gravitates towards fully adjusted positions.' The study of normal accumulation paths through the supermultiplier is obviously useful for policy analysis; the supermultiplier is also relevant to the study of crises, since even long-lived economic regimes may contain the seeds of their own dissolution, as we shall argue below.[21]

(iii) *FSP* supporters as well as some supermultiplier economists (e.g., Dejuan, 2005) would, like Garegnani (1962), include in 'final demand' the 'autonomous investment' associated with technical change. Taking the opposite view, Cesaratto, Stirati & Serrano (2003) maintain that *all* gross investment is induced in the sense that, *ceteris paribus*, in the long run autonomous investment displaces a corresponding amount of induced investment (Serrano, 1995, p. 81n); hence they do not assign to autonomous investment the

[21] Unfortunately Trezzini (2015) and Palumbo (2013) still do not appreciate the flexibility of the *SM* for analysing, also, the instability of capitalism in an ordered way.

Schumpeterian role of the principal driver of growth.[22] However, Cesaratto, Stirati & Serrano (2003, pp. 44–48) suggest a modification of the capital coefficient used in the supermultiplier which allows the model to take account of the fact that in each period autonomous investment might be supplemental to induced investment and support effective demand. A higher depreciation rate would also enable the supermultiplier to address the consequences of faster technological obsolescence. Cesaratto (1996) has argued that even technical change is largely demand driven: innovation is driven not by slumps, as Schumpeterians tend to think, but by expansions (see also Camara-Neto & Vernengo, 2012). And of course, product innovations play an essential role in sustaining the marginal propensity to consume and credit-driven autonomous consumption.

6.4. The Stability of the Supermultiplier Model

In a contribution which is to appear in the second part of this symposium Freitas & Serrano (2015; see also Serrano & Freitas, 2007) integrate into the supermultiplier model an explicit stability argument that I will heuristically sum up here.

Starting from a fully-adjusted position, suppose that g_z rises. The actual growth rate of output and aggregate demand g_a also increases, and as a consequence induced consumption and investment will also grow. The degree of capacity utilisation becomes higher than normal. The rise in the induced components of aggregate demand generates, in turn, a further rise in g_a, a further climb in the induced components, and so on and so forth. Recalling that g_a

[22] Kalecki, too, appears to have been somewhat sceptical about the ability of technical change to drive accumulation. Writing of 'the influence of technological innovations', Kalecki (1967, pp. 150–151) argues that 'this factor is by no means necessarily adequate to secure the full utilisation of equipment or even to keep the degree of this utilization at a constant level. Innovations break the impasse of a simple reproduction only to some extent and they do not warrant the utilization of resources in the sense of Tugan-Baranovski.'

is a weighted average of g_z and of the growth rate of the induced components of aggregate demand, among which investment is the fastest growing, it will be the case that $g_k > g_a > g_z$. The exogenously given g_z anchors, so to speak, g_a (unless the reaction of investment is too strong and g_k drags g_a away in a Harrodian fashion). Therefore, in spite of the fact that the attempt by firms to adjust the capital stock is an additional stimulus to aggregate demand, the capital stock and capacity are rising more rapidly than aggregate demand and output, so that capacity utilisation u_a is falling and tending to normality. The fact that u_a tends to normality means that the escalation of g_k is slowing down. This implies that the rise of g_a is slowing down as well, and that g_k tends towards g_a, which in turn tends towards g_z.[23]

Summarising, while in Harrod investment is the engine of both demand and the adjustment of capacity, and the two roles may compound spiralling instability, in the supermultiplier approach aggregate demand is anchored to g_z, a variable that is not *prima facie* affected by the adjustment process. Therefore, as long as the effects of the higher investment on the supply side (i.e., on capacity) are larger and faster than those on the demand side, this adjustment will not create instability.

Freitas & Serrano (2007, pp. 33–34) point out that what we have described satisfies a necessary condition for stability, in the sense that that it shows that the direction of the adjustment is correct. It becomes a sufficient condition if the reaction of investment is not 'too strong' (see Freitas, 2007).

7. Conclusions: Formal Stability and 'Destabilising Stability'

I consider the supermultiplier approach to be an important step forward in non-orthodox growth theory, not just because it overcomes the formal deficiencies of previous models, but

[23] Dejuan (2005) argues in a similar vein, but his stability proof assumes, unrealistically, that entrepreneurs know g_z.

because by assigning a central role to Kalecki's external markets (or Garegnani's final demand) it opens the way to a richer description of real capitalism. I also fully acknowledge the limitations of the investigation of (formally stable) normal accumulation paths in view of the instability of capitalism, limitations to which the *FSP* is particularly sensitive. Stylised models are, however, essential to fix our ideas and for policy purposes, as the exponents of the *FSP* also generally acknowledge. In view of this, the distance between the two Sraffian positions should not be exaggerated.

The importance I have attributed to a formal stability proof, moreover, does not in any sense imply that capitalism is stable.[24] Stability is a basic requirement for a good model since real phenomena, economic or not, although they are continuously changing, are rarely explosive. Capitalism is subject to minor and, as we have recently experienced, major crises. Harrod instability is not a satisfactory explanation of these crises, although it has the merit of showing their potential cumulative course in economies without 'external markets', as pointed put by Kalecki. Following his lesson, I have here criticised the investment-centred theories of capitalist development and crisis that neglect the autonomous components of aggregate demand. I started from a fundamental contradiction of capitalism, which Kalecki described in better terms than Keynes: the effects of inequality in income distribution on aggregate demand or, in other words, the problems of the realisation of the capitalists' social surplus. In a market economy 'external markets' may temporarily solve the realisation problem. By definition these markets are financed by the creation of purchasing power, and we see here an important field of convergence with the literature on endogenous money. The creation of purchasing power finances the external markets that absorb the capitalists' surplus and return it to the capitalists in the form of profits. Capitalists thus become creditors of those

[24] These final observations have been prompted by a remark I received from Randall Wray at a presentation in Copenhagen in May 2011.

markets. We find here a main source of instability in the building up of unsustainable imbalances between core-capitalism and the external markets in what is, in the end, a debt-driven model of capitalism that both the US and the Eurozone have played with (Cesaratto & Stirati, 2011; Cesaratto, 2012). There is here a point of convergence with the work of Hyman Minsky (1986) and his followers on the financial fragility of capitalism. I therefore close by acknowledging once again the limitations of the investigation of formally stable growth paths and the necessity, emphasised by Garegnani & Trezzini (2010) among others, of integrating the analysis of long-run growth with that of the cycle and crises.

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