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Amit Bhaduri

On the Dynamics of Profit- and Wage-led Growth

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Amit Bhaduri

On the Dynamics of Profit- and Wage-led Growth

Contents

Abstract

This paper examines how variable output and profit share jointly determine investment and saving, while the difference between investment and saving determines the changes in output and profit share. Analysis of the resulting pair of differential equations yields novel implications for the multiplier process. In this more general framework a number of separate strands of the Keynesian inspired literature can be understood. In particular the model incorporating both forced saving and profit squeeze analyses stability of the dynamical system to bring out the complex relation between in- and out-of-equilibrium profit- and wage-led regimes.

Keywords: *profit-led, wage-led; in- and out-of-equilibrium dynamics; local, Liapunov stability; stable-unstable bifurcation; forced saving; profit squeeze; multiplier*

JEL classificaiton: *B22, C62, D33, E12, E22, E31*

Amit Bhaduri

On the dynamics of profit- and wage-led growth*

The problem

In the traditional multiplier analysis, saving as an endogenous variable adjusts to investment as an exogenous variable in two different ways. The adjustment takes place either through changes in the level of income (Kahn, 1972; Kalecki, 1971; Keynes, 1936, 1937), or in its distribution, the latter brought about by disparate movements between the price level and the money wage rate leading to 'profit inflation' and forced saving by the workers (Keynes, 1930; Hicks, 1967; Kaldor, 1956; Pasinetti, 1962). Consequently, the same multiplier mechanism has the dual task of determining both the level of output and its distribution through the single equation of saving investment equality in equilibrium.

The problem of how to determine endogenously both the level and the distribution of income can be dealt with from different angles. It is simplest to assume that output adjusts below full employment, while at full employment price rises faster than money wage to close the inflationary gap. The same problem can also be dealt with through larger models within a Keynesian demand-determined framework, providing additional equations for the labour market, the money market, inventory adjustment etc.[1] However, following the original lead of Keynes (1930; 1936), this paper examines the multiplier mechanism by focusing exclusively on the product market. By removing the assumption that a precise level of full employment or full capacity output separates quantity from price adjustment, our approach permits both the level and the distribution of income to adjust simultaneously at different speeds during the working of the multiplier process. It results in a characterization of this process in a dynamic 'partial' equilibrium framework involving two adjustment equations for the product market relating to the level and distribution of income. Thus, the paper extends the multiplier analysis to situations characterized by the two-way feedback between changes in investment and saving on the one hand, and variations in capacity utilization and distribution on the other. The dynamic interaction among the variables gives rise to a range of possibilities which are classified with a view to exploring their ability to restore saving investment equilibrium, while the accompanying changes in

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[1] Recent important examples of research along these lines are Taylor (2004); Chiarella and Flaschel (2000); Skott (1989), among several others. Both Taylor and Chiarella also provide a critical survey of the literature, and reformulations, constructing sophisticated higher dimension models involving various markets.

output and distribution also link them analytically with profit- or wage- led expansion in both in- and out-of-equilibrium situations.

Profit- and wage-led equilibrium locus

In a closed economy, any redistribution of income between profits and wages affects aggregate demand through two different channels. If the propensity to consume out of wage income is higher than that out of profit income, redistributing income against the wage earners would depress total consumption expenditure, but at the same time it might stimulate investment expenditure through higher profit share to counteract the depressing effect of lower consumption on aggregate demand. Depending on which of these two effects dominates quantitatively, two alternative possibilities emerge for demand-led expansion. The case dominated by greater consumption expenditure due to higher real wages and lower profit share is called wage-led, whereas the case dominated by greater investment expenditure due to higher profit share and lower real wages is termed as profit-led.[2]

The essential formalism of these two regimes is easy to capture by normalizing the relevant variables with respect to full capacity output (Y^*). Thus, under the simplifying Classical assumption that no fraction of wage and a constant fraction ($1 > s > 0$) of profit is saved, the (normalized) saving of the economy is written as,

$$S = s.h.z,\ 1 \geq z\ ,\ h \geq 0, \tag{1}$$

where h = share of profit in output; and $z = \left(Y / Y^* \right)$ = degree of capacity utilization, with $Y^* = 1$, i.e. the normalized level of full capacity output.

To examine the interaction between investment and saving in response to variable levels of output and income distribution, we assume that (normalized) investment (I) depends positively also on the same two variables, z and h. Expectations are assumed to be formed in a climate of 'business as usual', so that 'conventions' rule (Keynes, 1937), and the ruling expectations formed by extrapolating into the future the current state of affairs, are static. On these assumptions, the investment function is written as[3],

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[2] Bhaduri and Marglin(1990), Marglin and Bhaduri (1990) in their original formulation called the wage-led regime stagnationist, and the profit-led regime exhilarationist. See also Taylor (2004), p. 128.

[3] With money wage (w) as the only variable cost, x = labour productivity, and m = proportional mark-up on cost, price $p = (1 + m)(w / x)$, so that $(1 - h) = (w / px)$, from which h is related positively to profit margin (m) by the expression, $h = m / (1 + m)$, yielding $I_h = (1 + m)^2 I_m > 0$ from (2).
Thus, higher profit share might stimulate higher investment through higher profit margin, and also probably from higher retained profit.

$$I = I\,(z, h)\ ,\ I_z > 0,\ I_h > 0. \tag{2}$$

Total differentiation of (1) and (2) yields the slope of the equilibrium locus of saving–investment equality, or the IS curve in the h-z space as,

$$dz\ /\ dh = (I_h - sz)\ /\ (sh - I_z). \tag{3}$$

Along the equilibrium IS locus, a positive slope of the IS curve in (3) means that a higher profit share (h) is associated in equilibrium with higher capacity utilization (z), characterizing a regime of profit-led equilibrium positions. Contrariwise, a negative slope in (3), associating a lower profit share with higher capacity utilization, corresponds to the wage-led equilibrium positions.

It is well known that the convergence of the one-variable output adjustment through the multiplier process requires saving to be more responsive than investment to changes in income, implying the Keynesian stability condition,

$$(sh - I_z) > 0. \tag{4}$$

When (4) is satisfied, the denominator on the right-hand side of expression (3) is positive, while a positive numerator of (3) implies,

$$(I_h - sz) > 0. \tag{5}$$

Conditions (4) and (5) together yields a positively sloped IS curve depicting a continuum of profit-led equilibrium positions. Since inequality (5) also means that the stimulating effect of a higher profit share on investment outweighs its depressing effect on consumption expenditure, it is natural to interpret condition (5) as the requirement for profit-led regimes. And, with inequality (5) reversed, i.e.

$$(I_h - sz) < 0, \tag{6}$$

the economy satisfies for the opposite reason the requirement of wage-led regimes (Bhaduri and Marglin, 1990). Note however that this equilibrium interpretation of profit- and wage-led regimes in terms of the responses of investment and saving to profit share (conditions 5 or 6) depends crucially on the stabilizing leakage from saving being greater than the stimulating injection of investment to changes in income (condition 4), while profit share is treated as exogenous.

Stability

Since the equality between investment and saving holds, all points on the IS curve are equilibrium rest points for both z and h. Comparisons of different points on the IS curve could be interpreted as 'movement' along the IS curve by treating one of the variables, z or h, as a policy parameter whose value can be exogenously fixed. In effect this reduces the underlying dynamical system to a single variable, with the other variable treated as exogenous. In the above analysis, h is treated as exogenous, reducing the system to the usual Keynesian income determination process, with capacity utilization (z) as the only variable adjusting to excess demand in the product market. In this case the quantity-adjustment equation is written explicitly from (1) and (2) as,

$$dz/dt = \alpha\,[\,I(h, z) - shz\,]\,,\ \alpha > 0, \tag{7}$$

where α is some arbitrary positive speed of adjustment, h is exogenously given by assumption, and condition (4) holds for the stability of the adjustment process.

However, the adjustment process in (7), although stable under (4), might not remain stable if income distribution h is also allowed to adjust endogenously.[4] The endogenous adjustment in h takes place if both the price level and the money wage rate rise at disparate rates in response to the product market disequilibrium.[5] In general the price–money wage dynamics would be influenced by the state of demand in the product market, the inventory positions of the firms and, in particular, by the extent of unemployment, and the bargaining power of the contending parties in the labour market (cf. Chiarella and Flaschel, 2000). However, these complications are avoided in the present analysis to focus exclusively on the flow equilibrium (I = S) in the product market.[6]

If both z and h adjust in response to investment saving disequilibrium, in addition to equation (7) we have,

$$dh/dt = \beta\,[\,I(h, z) - shz\,],\ \beta > 0, or\, \beta < 0. \tag{8}$$

Equation (8) generalizes the usual Keynesian argument. In the neo-classical interpretations of Keynesian theory, it is argued that an excess demand in the product market is closed through a higher level of output produced by profit maximizing firms at a lower real wage rate. Thus, profit maximizing equilibrium is reached through forced saving by the workers, either due to 'money illusion' (Keynes, 1936; Trevithick, 1975), or

4 Intuitively speaking, adjustment in z may be counteracted sufficiently by adjustment in h through its impact on I or S.

5 It should also be mentioned here that the profit share may vary for other reasons, e.g. contra-cyclically due to fixed administrative wage cost and labour hoarding over the cycle (Kalecki, 1971; Okun, 1981).

6 Ignoring complications due to inventories restrict even the product market analysis to flow equilibrium without adjustment in the stock of inventories (Hicks, 1974).

unanticipated inflation (Friedman, 1968) or some other form of information failure (Blachand, 1990).[7] In our formalism forced saving by the workers corresponds to the case of $\beta > 0$ in (8), because it ensures falling real wage rate and rising profit share in response to excess demand in the product market (I > S). However, the present formulation is more general, in so far as it allows also for the opposite case of profit squeeze imposed on the firms by the workers. It is captured by $\beta < 0$ in (8), as in this case, the money wage rate rises faster than the price level with the result the real wage rises and the profit share falls in response to excess demand in the product market. Between forced saving and profit squeeze lies the border line case in which the real wage rate remains constant, i.e. $\beta = 0$ (Kalecki, 1971; also Keynes, 1939). However, this particular case will not be considered further, as it leaves us formally with only the case of pure quantity-adjustment in (7).[8]

Equations (7) and (8) are identical except for the multiplicative factors of the speeds of adjustment α and β respectively. Consequently, the dynamical system defined by them is under-determined. Thus, in equilibrium the adjustment speeds play no role, and the investment saving equality provides only one equation for determining endogenously both h and z. However, in the out-of-equilibrium dynamics the speeds of adjustment play their role in guiding the trajectories. The slope of the integral curve obtained from dividing (7) by (8) at non-zero (i.e. out-of-equilibrium) values indicates how the adjustment speeds influence the out-of-equilibrium behaviour of the system on the h.z plane, i.e.

$$dz/dh = \alpha / \beta. \ \alpha > 0, \ \beta > 0 \text{ or } \beta < 0. \tag{9}$$

When $\alpha > 0$ and $\beta > 0$, in view of (7) and (8) both z and h rise endogenously in response to excess demand in the product market, and the out-of-equilibrium dynamics appear profit-led with forced saving by the workers. On the other hand, if $\alpha > 0$, but $\beta < 0$, an excess of investment over saving would drive h and z in opposite directions, and the out-of-equilibrium dynamics become wage-led with profit squeeze (Goodwin, 1967). Therefore we are able to ascertain the equilibrium and the out-of-equilibrium slope on the h.z plane by using equations (3) and (9) respectively.

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7 In this way the theory of effective demand was reconciled with profit maximizing equilibrium under the assumption of diminishing return to labour in the *General Theory* (Keynes, 1936). However, Keynes (1939) soon realized that this way of dealing with the supply side, instead of strengthening damages the theory of effective demand. Nevertheless, this profit maximizing assumption is the distinguishing mark of mainstream textbooks interpreting Keynesian theory. The real wage rate, determined endogenously in the Keynesian system through the link between the money wage rate and the price level, cannot be treated as a policy variable, unlike in some neo-classical discussions; see also Taylor (2004), pp. 132-136, on this point.

8 When the nominal money wage rate chases the rising price level at the same rate, but with a constant time lag, the real wage rate is depressed by a constant fraction once for all with perpetual inflation at a constant rate (Keynes, 1940; Trevithick, 1975). Kalecki (1976) develops similar ideas to explain stagflation in a developing economy.

The local stability of the dynamical system (7) and (8) is examined through routine calculation of the trace and the determinant of the relevant partial derivatives evaluated at an equilibrium point on the IS curve. The condition of a negative trace for stability is,

$$\alpha(I_z - sh) + \beta(I_h - sz) < 0. \tag{10}$$

However, the determinant is zero because the two linearized equations (7) and (8) around the equilibrium value are linearly dependent, i.e.

$\begin{pmatrix} \alpha(I_z - sh) & \alpha(I_h - sz) \\ \beta(I_z - sh) & \beta(I_h - sz) \end{pmatrix}$ = 0, showing a continuum of equilibria along the IS curve.

With the determinant zero and the trace negative, one characteristic root is negative and the other zero implying local stability.

The local stability analysis can be extended to a larger neighbourhood domain of the equilibrium by considering the function,

$$V = (1/2)\left[I(z,h) - shz\right]^2 , \tag{11}$$

Since in that domain all the partial derivatives are assumed to exist and are continuous, and V is positive definite, stability within the domain is guaranteed by the second method of Liapunov so long as $dV / dt < 0$ (Arrowsmith and Place, 1982: 198; Gondolfo, 1995).[9] Differentiating (1) and (2) with respect to time, and substituting from (7) and (8), we obtain,

$$dV / dt = (I - S)^2 \left[\alpha(I_z - sh) + \beta(I_h - sz)\right] < 0 , \tag{12}$$

yielding the same trace stability condition (10).

Interpreted economically, elimination of excess demand in the commodity market requires, $(dI / dt) < (dS / dt)$ for $(I - S) > 0$, and, $(dI / dt) > (dS / dt)$ for $(I - S) < 0$. Differentiating (1) and (2) with respect to time, and substituting from (7) and (8), inequality (10) can be derived as a product term covering both situations $(I - S) > 0$, and $(I - S) < 0$. Therefore, with stability condition (10) satisfied, the generalized multiplier converges within the given domain, as the net 'leakage' from the income generation process through saving from changes in both z and h exceeds the net 'injection' to the same income generation process through investment.

[9] If (dV / dt) is negative definite, the equilibrium is asymptotically stable. A weaker Liapunov function would also guarantee stability if (dV / dt) is negative semi-definite.

Stability condition (10) involves 4 terms, and if each were allowed to take positive or negative value, there would be $2^4 = 16$ possible combinations. However, with α restricted by assumption to positive values, the number of possibilities gets reduced to $2^3 = 8$, which can be classified into two equal groups of 4 each in terms of their stability properties. In the former group the stability property is unambiguous irrespective of the magnitudes of the speeds of adjustment; whereas in the latter group, the relative magnitudes of the adjustment speeds matter.

When both the product terms, $\alpha(I_z - sh)$ and $\beta(I_h - sz)$ have the same sign, expression (10) is unambiguously either positive (i.e. unstable) or negative (i.e. stable). Thus, the system is unambiguously unstable in 2 cases, i.e. if, either $\alpha > 0$, $(I_z - sh) > 0$, $\beta > 0$, and $(I_h - sz) > 0$, or $\alpha > 0$, $(I_z - sh) > 0$, $\beta < 0$ and $(I_h - sz) < 0$. In the former case, according to equation (3) the combination of parameter values implies wage-led equilibrium along the IS curve but its out-of-equilibrium unstable dynamics is profit-led according to equation (9). In the latter case, the opposite holds, namely the system is profit-led in equilibrium along the IS curve, but when out-of-equilibrium, it is wage-led and unambiguously unstable.

The system is unambiguously stable in the opposite case when both the product terms involved in the stability condition (10) are negative, i.e. $\alpha > 0$, $(I_z - sh) < 0, \beta > 0$, $(I_h - sz) < 0$, implying wage-led equilibrium along the IS curve according to (3), but profit-led stable out-of-equilibrium dynamics by (9) (phase diagram 1). Or, alternatively, $\alpha > 0$, $(I_z - sh) < 0$, $\beta < 0$, $(I_h - sz) > 0$, implying equilibrium along the IS curve is profit-led by (3), but stable out-of-equilibrium dynamics is wage led-by (9) (phase diagram 2).[10]

Closer geometric inspection of the phase diagrams reveals the pattern that in cases of unambiguous stability (or instability), equilibrium movement along the IS curve according to (3), and out-of-equilibrium movement according to (9) are characterized by contradictory properties of the two regimes. Thus, in the unambiguously stable cases if the equilibrium movement is wage-led because h and z are negatively related along the IS curve, the out-of-equilibrium stable dynamics is profit-led as h and z move together along the trajectory of the resultant arrow (see phase diagram 1), and vice versa (see phase diagram 2).[11]

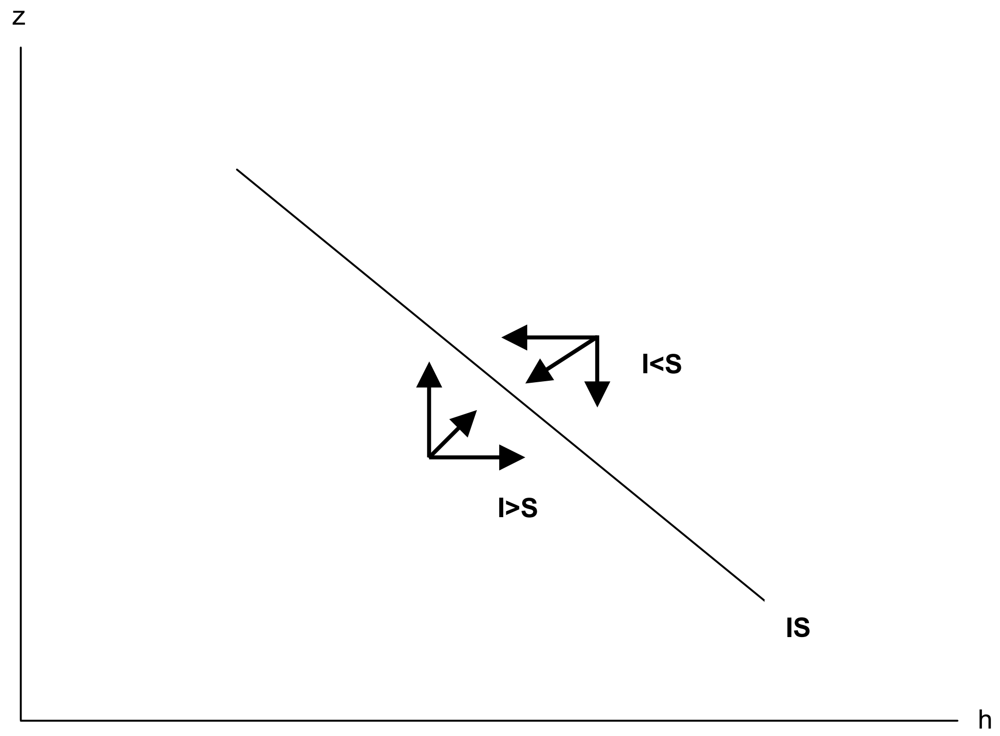
[10] Note that the unambiguously unstable cases violate the Keynesian stability condition (4), while the unambiguously stable cases satisfy the same stability condition.

[11] The phase diagram for the two unambiguously unstable cases are not drawn to save space. They can be easily drawn to check that their unstable out-of-equilibrium trajectories have exactly the opposite direction to those indicated in diagrams 1 and 2.

Diagram 1

Wage-led in-equilibrium; profit-led out-of-equilibrium

Below the line, *I* > *S* at low output: $(I_z - sh) < 0$; or low profile share: $(I_h - sz) < 0$.
Output rises (stabilizing) with forced saving (stabilizing): $\alpha > 0$, $\beta > 0$.

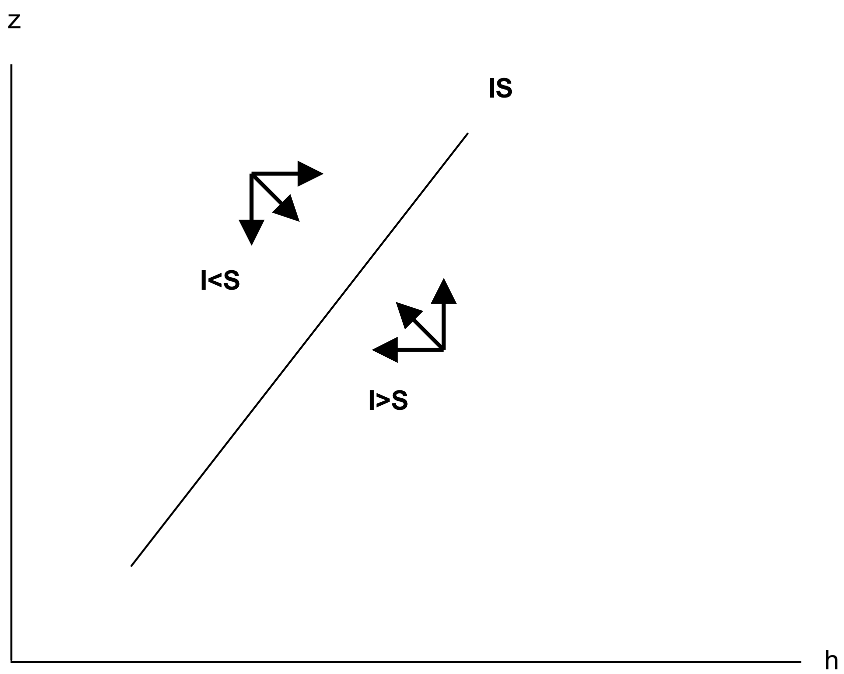


Note that in all phase diagrams 1-6, classification of profit-led and wage-led regimes are done according to the signs of the slopes of the IS curve (equation 3), and of the integral curve (equation 9) to represent in- and out-of-equilibrium directions of movement on the phase plane. However, the classification does not consider whether investment increases more or less than saving as profit share increases.

Diagram 2

Profit-led in-equilibrium; wage-led out-of-equilibrium

Below the line, *I* > *S* at low output: $(I_z - sh) < 0$; or high profit share: $(I_h - sz) > 0$.
Output rises (stabilizing) while profits are squeezed (stabilizing): $\alpha > 0$, $\beta < 0$.



The relative magnitudes of the speeds of adjustment enter the stability condition (10) in an essential way in the remaining group of 4 cases yielding ambiguous stability property (diagrams 3-6). In these cases the stability condition (10) involving the two product terms, $\alpha\ (I_z - sh)$ and $\beta(I_h - sz)$ have opposite signs, so that the relative magnitudes of α and β become critical in determining the sign of their algebraic sum. Since the negative term implies leakage from, and the positive term entails injection into aggregate demand, leakage has to dominate quantitatively injection to satisfy stability condition (10). From this point of view, the relation between in- and out-of-equilibrium movement also needs to be understood in terms of the behaviour of excess demand (I > S) or supply (I < S) in the product market. The IS curve divides in all cases the phase plane into regimes of excess (I > S) or deficit (I < S) of investment over saving.[12] From an economic point of view, in situations of excess demand (I > S), stability requires that the leakage of demand from increases in saving outweighs the injection from increases in investment, while the quantitative strengths of leakage and injection depend also on the magnitudes of the speeds of adjustments. Thus, when Keynesian stability condition (4) is violated but

[12] The division of the phase plane into I > S and I < S is done by considering the direction of the vertical arrow. By equation (7) if it directs upwards (downwards) I > S (I < S).

condition (6) holds, the equilibrium IS regime is profit-led according to the slope of the IS curve (diagram 4). In this case net leakage increases at higher profit share due to inequality condition (6), which has to be fortified by the further assumption that the speed of adjustment in profit share $\beta > 0$ is sufficiently large to close the excess investment gap, as saving increases faster than investment with increasing profit share (diagram 4, upper right corner). This implies an apparently paradoxical situation in which saving increases more than investment with higher profit share in a regime which is profit-led, according to not only the equilibrium slope condition (3), but also the disequilibrium slope condition (9) (diagram 4). Similarly, if falling profit share due to profit squeeze reduces investment more rapidly than saving, the excess demand gap decreases at lower profit share in an otherwise wage-led regime and stabilizes the system, provided the speed of adjustment $\beta < 0$ is sufficiently large in absolute value (diagram 6). Therefore, our previous classification of regimes needs to be qualified by the understanding that investment does not necessarily rise more (less) than saving with increasing (decreasing) profit share in a regime which appears profit-led (wage-led) by the signs of the slopes in equations (3) and (9), which is positive (negative) for profit-led (wage-led) regimes.

Diagram 3

Profit-led in- and out-of-equilibrium

Below the line, *I* > *S* at low output: $(I_z - sh) < 0$; or high profit share: $(I_h - sz) > 0$.
Output rises (stabilizing) with forced saving (destabilizing): $\alpha > 0$, $\beta > 0$.

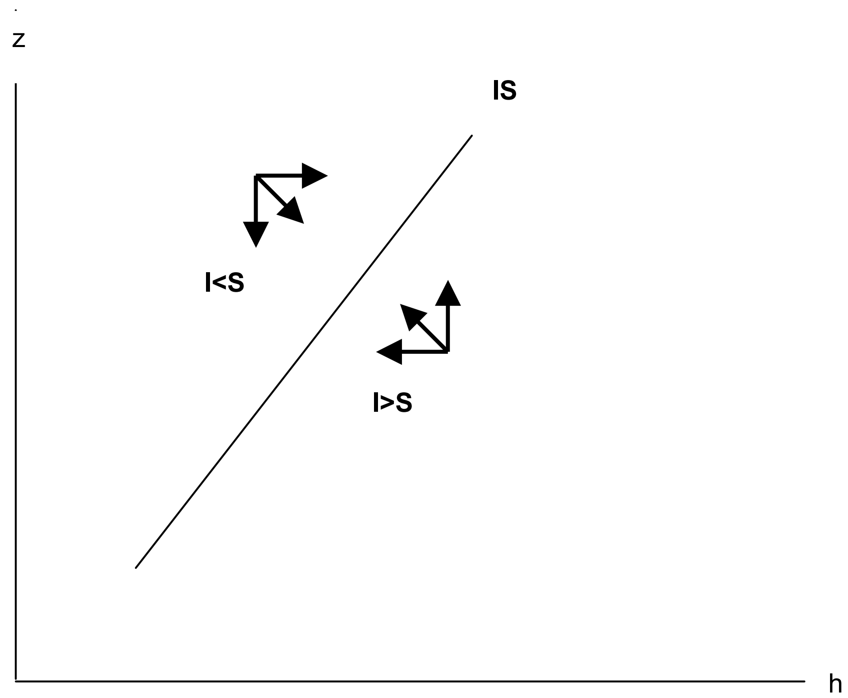
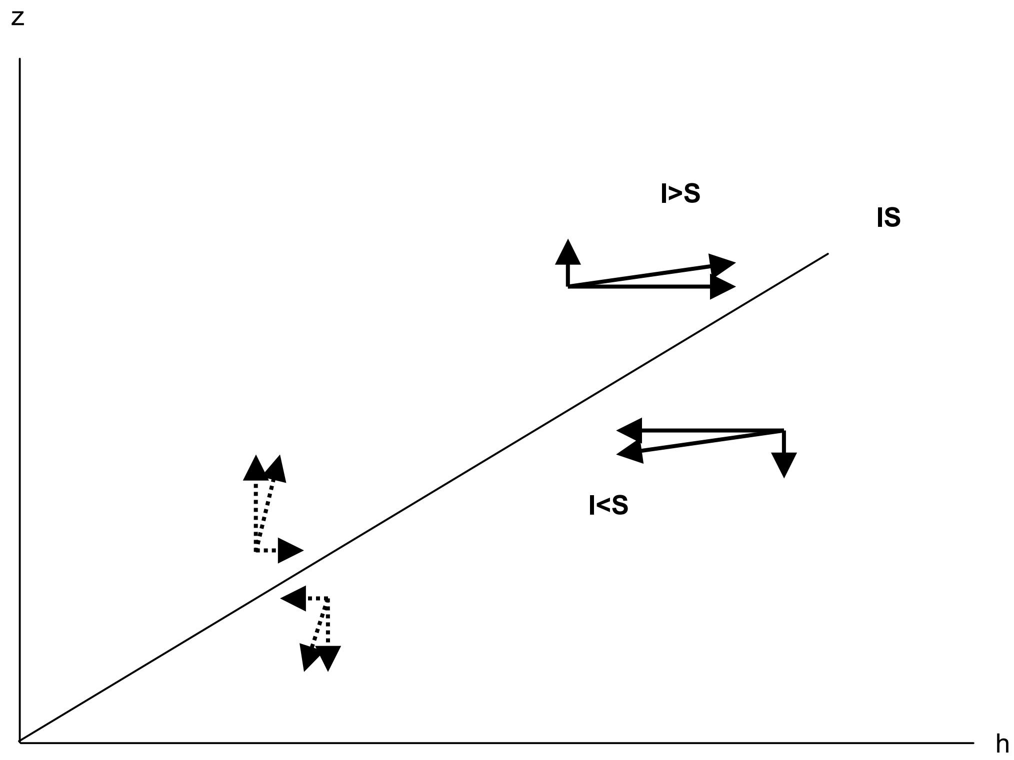


Diagram 4

Profit led in- and out-of-equilibrium

Above the line, *I* > *S* at high output: $(I_z - sh) > 0$, or low profit share: $(I_h - sz) < 0$.
Output rises (destabilizing) with forced saving (stabilizing): $\alpha > 0$, $\beta > 0$.



All the four phase diagrams 3 to 6 of ambiguous stability reveal a general pattern. The relative magnitudes of the speeds of adjustment, shown by the relative lengths of the vertical and horizontal arrows, control the slopes of the relevant out-of-equilibrium trajectories in such a way that they end up on equilibrium rest points on the IS curve in the stable cases guided by the solid arrows; whereas in the unstable cases they move away from the same IS curve shown by the broken arrows. An interesting contrast can be brought out by comparing geometrically the unambiguously stable cases (diagrams 1 and 2) with the ambiguously stable cases (diagrams 3-6). In the unambiguously stable cases (diagrams 1 and 2) the in- and out-of-equilibrium movements are in opposite directions, belonging to the two opposite regimes of profit- and wage-led growth. In contrast, in diagrams 3-6 stability property is ambiguous, precisely because the equilibrium and out-of-equilibrium movements have the same direction. They conform to the same regime characteristics of being profit-led or wage-led in so far as the slope of the IS curve (equation 3) and the slope of the integral curve (equation 9) have the same sign.[13]

[13] Subject to the qualification discussed above that profit-led (wage-led) regime does not necessarily mean that I rises more (less) than S with rising h.

Diagram 5

Wage-led in- and out-of-equilibrium

Below the line, *I* > *S* at low output: $(I_z - sh) < 0$; or low profit share: $(I_h - sz) < 0$.
Output rises (stabilizing) with profit squeeze (destabilizing): $\alpha > 0$, $\beta < 0$.

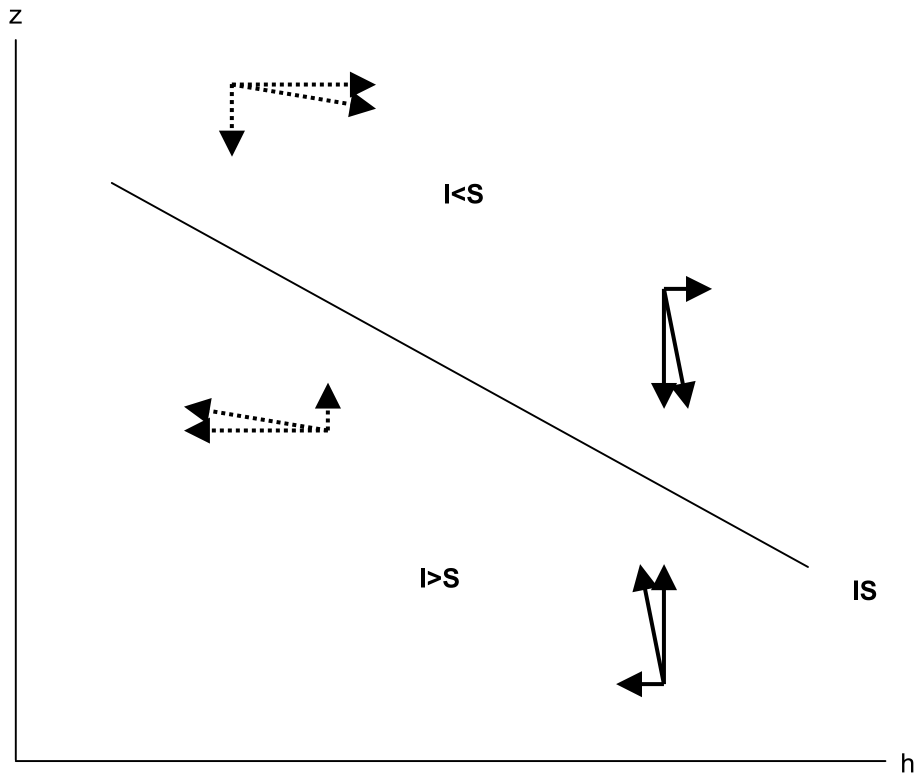
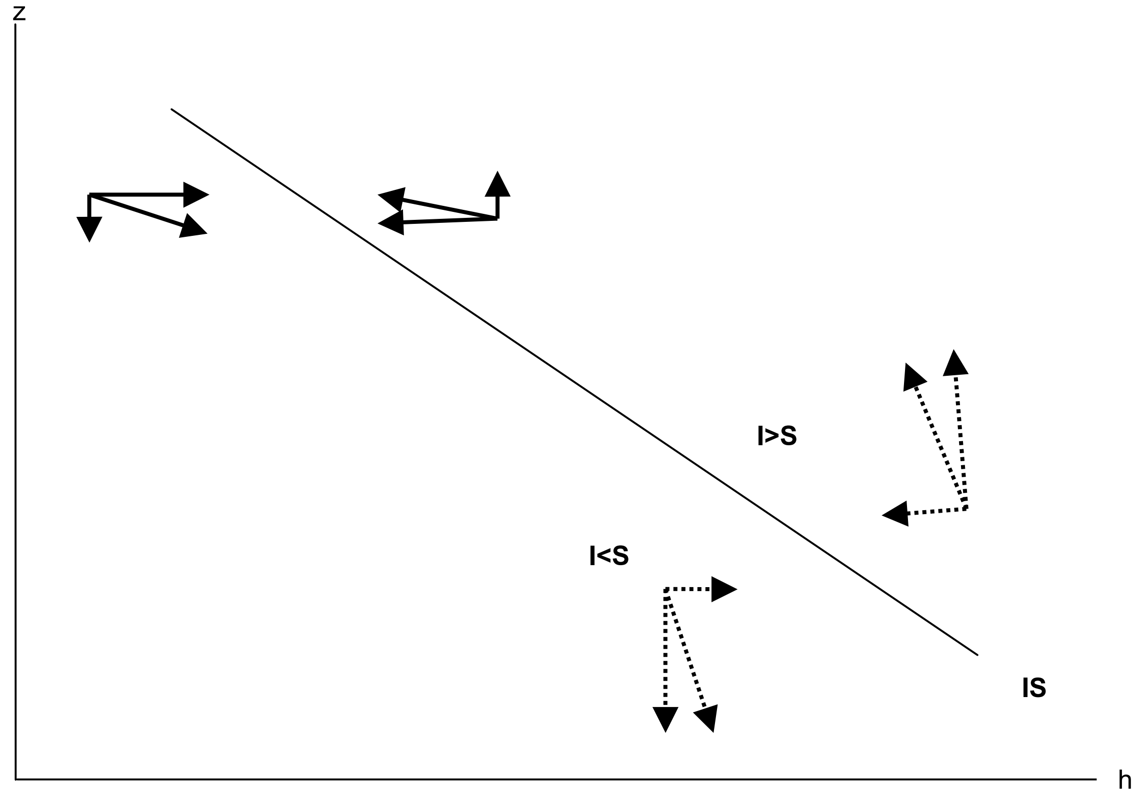


Diagram 6

Wage-led in- and out-of-equilibrium

Above the line, *I* > *S* at high output: $(I_z - sh) > 0$; or high profit share: $(I_h - sz) > 0$.

Output rises (destabilizing) with profit squeeze (stabilizing): $\alpha > 0$, $\beta < 0$.



Comparative static exercises

Our interest in comparative static exercises in the present context arises from the fact that they relate not to particular equilibrium positions, but to a continuum of equilibria along the IS curve. The equilibrium slope of the IS curve from (3) and the out-of-equilibrium slope from (9) are linked by the stability condition (10) to ensure that the relevant trajectories ends up on the equilibrium IS curve. The comparative static exercise uses this property to examine how displacement through some parameter from the IS locus sets up trajectories in the stable cases for a return to the IS curve.

Consider first a parametric variation of the saving propensity.[14] Totally differentiating (1) and (2) with a variable saving propensity, and collecting terms, we obtain,

$$\left[(I_h - sz)(dh/dz) + (I_z - sh)\right]dz = hz.ds\,. \tag{13}$$

Inserting from (9) the slope of the out-of-equilibrium trajectory, and simplifying, we obtain,

$$(dz / ds) = \alpha hz / \left[\alpha(I_z - sh) + \beta(Ih - sz)\right]. \tag{14}$$

In the same way it can also be seen,

$$(dh/ds) = \beta hz / \left[\alpha(I_z - sh) + \beta(I_h - sz)\right]. \tag{15}$$

In view of stability condition (10) which makes the denominator negative in (14) and (15), the comparative static result follows, i.e.$(dz / ds) < 0$ and, $(dh / ds) < 0$ if $\beta > 0$, and $(dh / ds) > 0$ if $\beta < 0$.

A slightly different type of comparative static exercise can be carried out when a parameter, say the rate of interest i, affects investment and saving, i.e.

$$I\,(h, z, i) = s(i)hz, \text{ with the usual specifications } I_i < 0 \text{ and } s'(i) > 0. \tag{16}$$

Proceeding in the same way it can be seen,

$$(dz / di) = \alpha\left[hzs'(i) - I_i\right] / \left[\alpha(I_h - sz) + \beta(I_z - sh)\right], \tag{17}$$

$$(dh / di) = \beta\left[hzs'(i) - I_i\right] / \left[\alpha(I_h - sz) + \beta(I_z - sh)\right]. \tag{18}$$

In view of (10), the above implies that in stable cases, $dz / di < 0$; $(dh / di) < 0$ if $\beta > 0$ and $(dh / di) > 0$ if $\beta < 0$. Note that the comparative static results about capacity utilization involving α are unambiguous in sign irrespective of whether the regime is profit-led or wage-led. However, results about profit share involves β, and therefore depend on whether the out-of-equilibrium regime is profit- or wage-led according to equation (9).

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[14] A decrease in the saving propensity due to the wealth effect of a boom in the stock market (Bhaduri, Laski and Riese, 2006; Maki and Palumbo, 2001) or in the housing market (Baker, 2006; Campbell and Cocco, 2006), as has been reported widely in recent years, could be analysed in this framework. See also Bhaduri (2005) for a similar exercise in the context of growth theory.

A summing-up with observations

With its focus exclusively on the product market in a partial equilibrium framework, the paper examines the convergence of the multiplier process in a setting of variable output (z) and income distribution (h) interacting with changes in investment (I) and saving (S). The approach is formalized on the assumption that both S and I depends on h and z (equations 1 and 2), while the gap between I and S affects both h and z, giving rise to a pair of identical differential equations which differ only with respect to their speeds of adjustment (equations 7 and 8). This leads in turn to different characterizations of profit- and wage-led regimes, both in- and out-of-equilibrium, according to the signs of the slopes of the IS locus (equation 3) and the out-of-equilibrium trajectories (equation 9) on the h.z plane. The framework is also able to accommodate a wide range of possibilities for adjustment in the distribution of income through downward as well as upward variation in the real wage rate. While forced saving on the part of the workers due to money illusion, unanticipated inflation, or some other form of information failure is analysed ($\beta > 0$), the less discussed opposite case of profit squeeze is also considered ($\beta < 0$). Depending on the values of the various parameters, the formal analysis establishes that both forced saving and profit squeeze can lead to stability (condition 10), and restore the equilibrium between investment and saving. In some cases the system can even be unambiguously stable under profit squeeze irrespective of the speeds of adjustment of capacity utilization and income distribution (diagram 2). Therefore the neo-classical postulate is unwarranted that some version of money illusion is critical for output expansion through the stimulation of demand.[15]

Our analysis classifies the (eight) cases considered into two analytically distinct groups of equal size. Two unambiguously stable and two unambiguously unstable cases form the first group. The other group of remaining four cases have ambiguous stability property because stability in these cases depends on the relative magnitudes of the speed of adjustment of capacity utilization (α) and distribution (β). A comparison of equilibrium and out-of-equilibrium dynamics traced by the two groups revealed a contrast. In the unambiguously stable (or unstable) cases equilibrium movement indicated by the sign of the slope along the IS curve (equation 3) and the out-of-equilibrium movements given by the sign of the integral curve (equation 9) belong to opposite regimes, i.e. if the equilibrium movement along the IS curve is wage-led, the out-of-equilibrium movement is profit-led, and vice versa (diagrams 1 and 2 respectively). In contrast, in the latter group of cases of ambiguous stability, both the equilibrium and the out-of-equilibrium movements belong to the same regime, as the slope of the IS curve in (3) and of the integral curve in (9) have the same sign. This implies that movement in- and out-of-equilibrium is either profit- or wage-led (diagrams 3 to 6), subject to the qualification already pointed out that profit-led (wage-

[15] The assumption of profit maximizing equilibrium might be essential for neo-classical micro foundation, but it is not needed for the theory of demand-determined output (Keynes, 1939; Kalecki, 1971). See also footnote 7.

led) does not necessarily imply that investment rises more than saving at higher (lower) profit share in all circumstances.

The significance of the analytical framework developed in this paper might be appreciated better in the context of a wider theoretical debate concerning the link between production and distribution. The link is established at the aggregate level of neo-classical macroeconomic theory (also Keynes, 1936) through the postulate of a production function with standard properties coupled with the behavioural assumption of profit maximization leading to the marginal productivity theory of distribution. However, it is now beyond dispute that the aggregate production function has insurmountable problems, and its use with capital as a factor of production cannot be justified logically outside a one-commodity world (Sraffa, 1960; Samuelson, 1966). Therefore, the neo-classical link between production and distribution through an aggregate production function is unacceptably restricted. The analysis presented here suggests an alternative route to linking production with distribution by attempting to integrate the views of the Classical economists with the Keynesian theory of effective demand especially in the short-period context. The Classical approach was based on uncoupling long-period distribution from production. This paper suggests a different way in which the uncoupling between production and distribution might be achieved in the demand-determined framework. At the same time it suggests how some supply-side problems might be incorporated in the Keynesian framework through explicit considerations of the speeds of adjustment in capacity utilization and distribution. For instance, we might plausibly postulate that the speed of adjustment in capacity utilization α and its level z are usually inversely related. As the level of capacity utilization increases, various bottlenecks or rigidities appear on the supply side, which tend to delay and slow down the speed of adjustment in capacity utilization. As a matter of fact, this was presumed in drawing the phase diagrams 3 to 6 through suitable variations in the lengths of the vertical arrows (representing the magnitude of α) at relatively high and low levels of z. Similarly, it might be worth pondering whether the degree of tightness of the labour market and rising pressure on wages could be reflected in some ways through suitable modifications in the speed of adjustment of distribution, β .[16]

The dependence of the speeds of adjustment α and β on the variables h and z might result in non-linear trajectories with complex properties which need further explorations. However, consider a simple case in which β remains constant, but although always positive α is inversely proportional to z according to the relation,[17]

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[16] While a negative relation between α and z is presumed in phase diagrams 3-6, variations in β in relation to α is assumed arbitrarily to facilitate geometric exposition of stability or instability property.

[17] I owe the observation to a referee that the speed of adjustment α can be negative in a long-run context, when the two-sided role of investment in capacity utilization as well as in capacity creation comes into play. If capacity creation (Y*) proceeds at a faster pace than capacity utilization (Y) in certain boom conditions, the ratio (Y / Y*), i.e. z might be falling implying negative α. Complication belonging to the longer run is avoided in the Keynesian short-run analysis of the paper.

$$\alpha = (k / z),\ z > 0, \text{ and implying that the constant, } k = \alpha_{\min} \tag{19}$$

which is defined at the maximum value of z = 1.

Inserting (19), stability condition (10) reduces to

$$[\,(I_z - sh)\ \alpha_{\min}\,] + [z\,(I_h - sz)\,\beta\,] < 0. \tag{20}$$

Moreover, z reaches a critical value z_c when the left-hand side of (20) vanishes to yield,

$$z_c = [(I_z - sh)\ \alpha_{\min}\,] / [\,(sz - I_h\,)\,\beta\,]. \tag{21}$$

Thus, z_c the point of bifurcation separates stable from unstable cases.

In the light of (20), consider the 4 cases corresponding to the phase diagrams 3-6. In 3 and 5, the first square bracketed term is negative, and the second positive. In 4 and 6 the opposite sign pattern holds. For instance, as the gap (I - S) > 0 increases to raise z, the positive second term in (20) corresponding to diagrams 3 and 5 increases tending to destabilize the system, whereas in diagrams 4 and 6 for the opposite reason it tends to stabilize the system. However, whether the system actually attains stability depends in each case on whether the relevant negative term increases sufficiently in absolute value to cross the bifurcation value z_c in (21). For instance, stability cannot be achieved in cases 4 and 6 if even at the maximum value of z = 1, the left-hand side of the expression remains positive implying, $(I_h - s) / (sh - I_z) > (\alpha_{\min} / \beta)$, where the relevant partial derivatives are evaluated at z = 1.

We might also conjecture that with the trace (i.e. local stability) condition changing sign at the critical value, $1 > z_c > 0$, only a necessary condition for sustained endogenous fluctuations (e.g. limit cycles) is satisfied. However, since the determinant is strictly zero in the degenerate system of this model, it rules out possibilities of sustained fluctuations until richer dynamical systems are considered.

References

Arrowsmith, D. K. and C. M. Place (1982), *Ordinary Differential Equations*, London, Clapham and Hall, Chapter 5.

Bhaduri, A., K. Laski and M. Riese (2006), 'A model of interaction between the virtual and the real economy', *Metroeconomica*, Vol. 57, , pp- 412-27.

Bhaduri, A. (2005), 'On different regimes of accumulation', in: Bill Gibson (ed.), *Joan Robinson's Economics*, Cheltenham, Edward Elgar, pp. 195-203.

Bhaduri, A. and S. Marglin (1990), 'Unemployment and the real wage: the economic basis for contesting political ideologies,' *Cambridge Journal of Economics*, Vol. 14, pp. 375-93.

Blachand, O. J. (1990), 'Why does money affect output', in B. M. Friedman and F. H. Hahn (eds), *Handbook of Monetary Economics*, Amsterdam, Elsevier.

Chiarella, C. and P. Flaschel (2000), *The Dynamics of Keynesian Monetary Growth: Macrofoundation*, Cambridge, Cambridge University Press.

Foley, D. and T. Mitchl (1999), *Distribution and Growth*, Harvard, Harvard University Press.

Friedman, M. (1968), 'The role of monetary policy', *American Economic Review*, Vol. 58, pp. 1- 17.

Gandolfo, G. (1996), *Economic Dynamics* (3rd Edition), Berlin, Springer, Chapter 23.

Goodwin, R. (1967), 'A growth cycle', in C. H. Feinstein (ed.), *Socialism, Capitalism and Growth*, Cambridge, Cambridge University Press.

Hicks, J. R. (1974), *The Crisis of Keynesian Economics*, Oxford, Clarendon Press.

Hicks, J. R. (1967), 'The Fundamental equation of the Treatise' in his *Critical Essays in Monetary Theory*, London, Oxford University Press.

Kahn, R. F. (1972), *Selected Essays in Employment and Growth*, Cambridge, Cambridge University Press.

Kaldor, N. (1956), 'Alternative theories of distribution, *Review of Economic Studies*, Vol. 23, pp. 83-100.

Kalecki, M. (1971), *Selected Essays in the Dynamics of the Capitalist Economy, 1933-1970*, Cambridge, Cambridge University Press.

Kalecki, M. (1976), 'The problem of financing economic development in a mixed economy' in his *Essays on Developing Economies*, Hassocks, Harvester Press.

Keynes, J. M. (1930), *A Treatise on Money*, Volume I, London, Macmillan.

Keynes, J. M. (1936), *The General Theory of Employment, Interest and Money*, London, Macmillan.

Keynes, J. M. (1937), 'The General Theory: fundamental concepts and ideas', *Quarterly Journal of Economics*, Vol. 51, pp. 1-19.

Keynes, J. M. (1939), 'Relative movements of real wages and output', *Economic Journal*, Vol. 49, pp. 34-51.

Keynes, J. M. (1940), *How to Pay for the War*, London, Macmillan.

Maki, D. M and M. G. Palumbo (2001), 'Disentangling the wealth effect: a cohort analysis of household saving in the 1990s', Mimeo, Board of Governors of the Federal Reserve System.

Marglin, S. and A. Bhaduri (1990), 'Profit squeeze and the Keynesian theory', in S. Marglin and J. Schor (eds), *The Golden Age of Capitalism*, Oxford, Clarendon Press; Cambridge, Mass., Harvard University Press.

Okun, A. M. (1981), *Prices and Quantities. A Macroeconomic Analysis*, Washington, DC, The Brookings Institute.

Pasinetti, L. L. (1962), ‘The rate of profit and income distribution in relation to the rate of economic growth’, *Review of Economic Studies*, Vol. 29, pp. 267-79.

Skott, P. (1989), *Conflict and Effective Demand in Economic Growth*, Cambridge, Cambridge University Press.

Taylor, L. (2004), *Reconstructing Macroeconomics*, Cambridge, Mass., Harvard University Press.

Trevithick, J. A. (1975), ‘Keynes, inflation and money illusion’, *Economic Journal*, Vol. 85, pp. 71-82.

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