Kalecki's Theory of the Business Cycle and the General Theory

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1. Introduction

Did Kalecki's pre-1936 formal work on the business cycle anticipate the revolutionary elements of Keynes's *General Theory*? The question has been subject to some debate. Many, including Robinson (1966) have said yes, while Patinkin's (1982) reply has been no.[1] Following Patinkin (1982), the revolutionary innovation of Keynes's work (the General Theory - unitalicised) is defined as the theory of effective demand, or the notion that investment and saving are equilibrated by variations in the level of aggregate output (or equivalently the idea that the goods market is cleared by output variations) under the assumption that the capital stock is given. Using this definition of the General Theory the question of whether Kalecki's work on business cycles anticipate Keynes is re-examined.[2]

Some might argue that Keynes's central innovation was wider than the theory of effective demand and that therefore comparing Kalecki and Keynes simply on this basis is inappropriate. The theory of effective demand in combination with an emphasis on the importance of investment volatility and an analysis of its determination is considered by some to be Keynes's central message (see for example Asimakopulos 1983).[3] While it is not in dispute that Keynes believed investment was volatile and considered it important to provide an explanation of investment, like Patinkin (1982, p. 6), I reject the suggestion that an emphasis on the volatility of investment and its importance in driving aggregate activity was a fundamentally novel analytical contribution of the General Theory. Indeed, following Marx, these ideas had been a staple of the business cycle literature for over fifty years and the work of Aftalion, J.M. Clark, Robertson and others had provided an accelerator theory of investment demand, giving an analytical explanation of investment volatility. Moreover, Keynes (1936, Chapter 22) claims no novelty for his views on investment volatility (see also Patinkin 1982, p. 13).

And nor, it might be added, does Kalecki (1933A, p. 67; 1933C, p. 110). However, the idea that the goods market could clear via variations in the level of output was a novel contribution of the first order before 1936. Such a theory then provides a solid logical link - which had hitherto been missing in macroeconomic theory - between investment and output as a whole and hence between investment volatility and output fluctuations.

To present the conclusions at the beginning, there are two main places where the theory of effective demand can be found in Kalecki's formal work on the business cycle. Both are where he undertakes comparative static exercises without considering the capacity-creating effects of investment. The first is where Kalecki considers a rise in the level of investment, while the second is where he considers a fall in the level of money wages. Kalecki also considers the case of a rise in the level of taxation, which is spent by government, but his analysis in this case is not consistent with the theory of effective demand. However, it is concluded that the theory of the short-period static determination of the level of output, without consideration of the capacity-creating effects of investment, while Keynes's central message, is not that of Kalecki's formal business cycle work. Rather, the theory of effective demand underpins the Kaleckian theory of the cycle.

In arguing for these conclusions, the article lays bare Kalecki's theory of output determination in his formal articles on the business cycle. The interpretation of the theory of output determination in Kalecki's business cycle work presented here differs from that of both Patinkin (1982) and Osiatynski (1985). The article also exposes some weaknesses of Kalecki's treatment of balanced budget changes in government spending and money wage cuts and critiques aspects of Patinkin's (1982) interpretation of Kalecki's work.

Kalecki published his *Essay on the Business Cycle Theory* (hereafter the *Essay*) in Polish in July 1933, a short booklet which was the first of a long line of mathematical elucidations of his theory of the business cycle. He presented a version of this model to the third European Conference of the Econometric Society held in Leyden between the 30th of September and the 2nd of October 1933.[4] On the encouragement of Georges Lutfalla, who had heard him present his paper at the Leyden conference (Lutfalla, 1987, p. 888), Kalecki (1935A) published a version in French in the *Revue d'Economie Politique*. This article was Kalecki's first piece in economics published outside Poland (Lutfalla 1987, p. 888).[5] An English version of this work was published later the same year in *Econometrica* as "A Macrodynamic Theory of Business Cycles." In 1966 a partial English translation of the 1933 booklet under the title "The Outline of the Business Cycle Theory" was published, about which Kalecki had this to say:

> The Outline of the Business Cycle Theory is the first (and most essential) part of my booklet An Essay on the Theory of the Business Cycle [translated in Kalecki 1990 as *Essay on the Business Cycle Theory*] which was published in 1933. I supplemented this study by a short passage concerning the problem of the money market taken from my "Essai d'une theorie du mouvement cyclique des affaires" published in the French quarterly *Revue d'Economie*

Politique, March-April 1935. Apart from this, nothing of importance has been added either to this or other items. (Kalecki 1966, p. 1)[6]

This partial translation of 1966 was also published, but without the warning of the additions from the *Revue d'Economie Politique* article or of the other changes, in Kalecki's *Selected Essays on the Dynamics of the Capitalist Economy* (1971). In addition to the three original business cycle publications,[7] there are two articles where Kalecki defends his business cycles theories in light of criticisms that they received. The first of these was published in Polish in the *Kwartalnik Statystyczny* [Statistical Quarterly] under the title "Critical Remarks on one of the Mathematical Theories of the Business Cycle' by Aleksander Rajchman: A Rejoinder", and as the title suggests was the response to criticisms in the same journal of the *Essay* by Aleksander Rajchman, professor of mathematics at Warsaw University and member of the Polish Communist Party. The second of these articles was published in *Econometrica* (Kalecki 1936B) and was a reply to criticisms of Kalecki's earlier *Econometrica* article by Ragnar Frisch and Harald Holme (1935) and Jan Tinbergen (1935).

The main focus of this article is on the *Essay*, but aspects of the two 1935 articles, Kalecki's responses to criticisms of the initial publications and the 1966 synthetic semi-translation are also considered where relevant. First, a brief outline is given of Kalecki's theory of profits, investment and the business cycle (essentially the same in the three original articles and in the synthetic semi-translation). Then Kalecki's theory of output is considered, followed by an examination of his analysis of the impact of wage cuts on output. Finally Patinkin's (1982) interpretation of Kalecki's business cycle work in the context of the General Theory is critically evaluated.

The *Essay* is divided into three parts. The first, entitled "Outline of a General Theory", contains a summary of the essential elements of Kalecki's theory, overlapping to a large degree with the synthetic semi-translation. Part II, "Mathematical Development", contains the mathematical elaboration of the model of the business cycle while Part III, "Applications", deals with topics "treated rather summarily in Part I... more intensively" (Kalecki 1933A, p. 66), including sections on the money market, production, prices and wages and the business cycle and cartels. Parts I and III of the *Essay* are those of relevance to this article.

2. The Theory of the Business Cycle

The *Essay* opens with Kalecki introducing his main themes and placing his work into context (Kalecki 1933A, pp. 67-68). It is clear from his introduction that Kalecki seeks to explain the business cycle - regular fluctuations in investment, profits, employment, "social income" (national income) and capacity utilisation. Kalecki makes the point that Aftalion had developed a similar theory of the investment cycle but indicates the difference is that he - unlike Aftalion - provides a theory of variable capacity utilisation where consumption is minimised during recessions and maximised during booms. It is in providing a theory of the determination of output and emphasising the variability of output at less than full

capacity that Kalecki suggests he is making an original contribution to business cycle theory.

Kalecki (1933A) begins his theoretical analysis by explicitly assuming a closed economy with no secular trend and implicitly no government activity.[8] He divides the economy into two classes, capitalists and workers. Where workers spend all their wages, as Kalecki assumes, the following relationship holds between capitalists' consumption C, gross capital accumulation A (current fixed capital investment) and profits P.

$$P = C + A \tag{1}$$

Thus investment equals saving, which is made solely from profits, on Kalecki's assumption that stock accumulation does not occur. Capitalists' consumption, argues Kalecki, consists of a constant amount B_o and a constant fraction λ (in effect the marginal propensity to consume from profits) of profits. Thus:

$$C = B_o + \lambda P \tag{2}$$

Substituting (2) into (1) allows Kalecki to obtain:

$$P = \frac{B_o + A}{1 - \lambda} \tag{3}$$

Kalecki explains that causality in this equation runs from investment to saving because:

> If some capitalists spend money, either on investment or consumption goods, their money passes to other capitalists in the form of profits. Investment or consumption of capitalists creates profits for others. Capitalists as a class gain exactly as much as they invest or consume, and if - in a closed system - they ceased to construct and consume they could not make any money at all. (Kalecki, 1933A, p. 79)

Kalecki distinguishes between orders I, production A and the delivery D of investment goods, each of which takes place at a different point in time. The change in the capital stock per unit time is deliveries less constant depreciation per unit time. He assumes that investment orders are an increasing function of the expected rate of profit and a decreasing function of the rate of interest i. The expected profit rate is determined by the current profit rate. The investment orders equation is written as:

$$\frac{I}{K} = f\left(\frac{P}{K}, i\right) \tag{4}$$

Kalecki makes the additional assumption that the rate of interest is an increasing function of the rate of profit (under the twin assumptions of no central bank intervention and no crises of confidence during the cycle). After substituting for the rate of profit, this allows Kalecki to write:

$$\frac{I}{K} = \psi\left(\frac{B_o + A}{K}\right)$$

which he then linearises as:

$$\frac{I}{K} = m\frac{B_o + A}{K} - n \qquad m, n > 0$$

and re-writes as:

$$I = m(B_o + A) - nK$$

which indicates that investment orders are an increasing function of gross accumulation and a diminishing function of the level of capital stock.

A main task of the 1933 booklet and the later two 1935 articles is to provide a theory of the business cycle using this fundamental equation. While Kalecki's theory of the business cycle is not directly relevant to this article, some understanding of its mechanism is relevant for the discussions which follow, so a brief synopsis of his theory will be given. At the trough of a depression new orders for investment goods are equal to production of investment goods (I = A). Actual additions to the capital stock, or deliveries of investment goods, are less than the amount required to make good depreciation and as a result the capital stock is falling. Since investment is neither rising nor falling between periods, profits remain constant, but the falling capital stock raises the rate of profit. The rising profit rate raises investment orders and, in the next period, gross accumulation. Higher gross accumulation raises profits, further stimulating investment orders. Eventually though the higher investment activity gives rise to the delivery of capital goods in excess of depreciation and this increase in the capital stock slows and eventually halts the growth in the rate of profit and expenditure. At the peak of the cycle investment orders are again equal to gross accumulation and profits are therefore stable, but the capital stock is increasing due to deliveries in excess of replacement and this lowers the rate of profit, causing investment orders and next period's gross accumulation to decline. Profits therefore decline, and a further downward reassessment of investment orders occurs and so on. Eventually deliveries of capital goods begin to fall short of replacement and the capital stock starts shrinking. The trough is finally reached when the positive effect on investment of shrinking of the capital stock exactly offsets the negative effect of the low production of investment goods on profits.[9]

3. The Determination of Aggregate Production

Following the above analysis of the determination of cycles of profits, investment, and changes in the capital stock, Kalecki moves on to consider aggregate production in the same section, entitled "The Mechanism of the Business Cycle". The following passage from this section is that portion of the *Essay* where (in his review of the *General Theory*) Kalecki (1936A, p. 228) claims - like Keynes - to show that investment determines the level of aggregate production. The same passage can also be found in virtually identical form in Kalecki's other pre-1936 business cycle works (see Kalecki 1933B, pp. 13-14; 1935A, pp. 295-7; 1935B, pp. 136-7):

> The fluctuations of the gross accumulation which result from this [the business cycle] mechanism [described above] must also be reflected in the

fluctuations of prices and the aggregate production. The gross real profits P are, on the one hand, an increasing function of the gross accumulation A... and, on the other hand, can be expressed as the product of the volume of the aggregate production and of the profit per unit of output. Thus aggregate production and prices (or indeed the ratio of prices to wages which determines unit profits) rise or fall together with gross accumulation in the course of the cycle.[8]

8. We assume here that aggregate production and profit per unit of output rise or fall together, which is actually the case. We shall examine this assumption in detail on pp. 98-100.

The relation between changes in gross accumulation, which is equal to the production of investment goods, and those of aggregate production and price materialises in the following way. When production of investment goods rises, aggregate production increases directly pro tanto, but in addition there is an increase due to the demand for consumer goods on the part of workers newly engaged in the investment goods industries. The consequent increase in employment in the consumer goods industries leads to a further rise in the demand for consumer goods. Since at the same time prices rise, new demand is met only in part by new production, and in part at the expense of incomes of the earlier employed workers whose real wages now decline. The levels of aggregate production and of prices will ultimately rise to such an extent that the increment in real profits balances the increment of the production of investment goods.

The account of the process is not yet complete because changes in capitalist consumption have not been taken into consideration. This consumption C, depends to a degree on aggregate profits, P, and will increase together with gross accumulation A, since from equations (2) and (3) it follows that $C = (B_o + \lambda A)/(1 - \lambda)$. The increase in capitalist consumption exerts the same influence as that in the production of investment goods: the production of consumer goods for capitalists expands; this leads to an increase in employment; and this raises again the demand for consumer goods for the workers, which causes a further rise in production and prices. The aggregate production and prices will ultimately rise to such an extent as to assure an increment of real profits equal to that of production of investment goods and capitalist consumption. (Kalecki 1933A, pp. 78-79)

Kalecki's model for determination of the level of aggregate production can be formalised. Kalecki explicitly indicates that his arguments are based on the identity $\frac{P}{Y} Y = P$ and this can be re-written, as he points out, using his profits equation which has been already been outlined, in the following form:

$$\frac{P}{Y} Y = \frac{B_o + A}{1 - \lambda} \qquad (3A)$$

The above quotation also shows that Kalecki assumes that the share of profits in national income is an increasing function of the level of production, as a higher

level of production raises prices relative to money wages (which Kalecki assumes explicitly) faster than the average product of labour declines (which he does not discuss):

$$\frac{P}{Y} = F(Y) \qquad F'(Y) > 0$$

Substituting the behavioural relation into the profits equation (3A) gives the model of output determination presented in the first part of his booklet:

$$Y = \frac{B_o + A}{F(Y)(1-\lambda)}$$

Kalecki's full investment multiplier is:

$$\frac{dY}{dA} = \frac{1}{[F(Y) + YF'(Y)](1-\lambda)}$$

In the second paragraph of the quotation cited above, he analyses the investment multiplier relationship without taking into consideration changes in capitalists' consumption ($\lambda = 0$). Since Kalecki indicates that the level of production rises by more than by the direct rise in production arising from an increase in production of investment goods, $\frac{dY}{dA} > 1$.[10] Then, as again indicated in the third paragraph of the above quotation, Kalecki includes the impact of an increase in capitalists' consumption due to higher profits in his analysis of the impact of a rise in investment ($\lambda > 0$).

Kalecki again directly considers the behaviour of output in Part III, entitled "Applications", of his 1933 booklet. This section is not translated in the synthetic semi-translation "Outline of a Theory of the Business Cycle" (1933B). In addition, it does not appear in the English or the French language versions of the business cycle article. Kalecki's analysis, under a sub-heading entitled "The curve of aggregate production", is summarised in the following quote:

> We presented gross profitability P/K as the product of the gross profit margin P/Y and capacity employment Y/K, and showed that P/Y and Y/K are both increasing functions of P/K. Each change in P/K is divided between both factors in such a way that Y/K always changes by a smaller percentage than P/K. Let us assume that this dependence between Y/K and P/K is linear, and recall that P is proportional to $B_o + A$ (where B_o is the constant part of capitalist consumption and A is gross accumulation); we then obtain:

$$\frac{Y}{K} = \frac{q(B_o + A)}{K} + r \qquad (38)$$

or

$$Y = q(B_o + A) + rK \qquad (38a)$$

The constants q and r are positive: q since Y/K is an increasing function of P/K, r since Y/K rises or falls more slowly than P/K. (Kalecki 1933A, pp. 102-3)

How does this theory of output, which Kalecki (1933A, p. 104) develops so that he can compare curves of investment, profits and production in his Figure 8,[11] relate to the theory of output presented in the first part of the *Essay*?

To derive the level of output in Part III, it can be shown that Kalecki imposes a specific functional form onto his earlier general assumption that the share of profit is an increasing function of output. This can be most easily shown by working back from Kalecki's equation (38a) using equation (3). This backward substitution gives:

$$Y = \frac{\varphi}{1-\lambda}\left(B_o + A\right) + rK$$

where $\frac{\varphi}{1-\lambda} = q$. This directly implies that $Y = \varphi P + rK$. Since in Part I Kalecki argues that, even if capitalists do not consume a proportion of profits ($\lambda = 0$), an increase in investment has multiplier effects on output, φ must exceed unity.[12] This equation can be further rearranged to yield an expression for the profit share:

$$\frac{P}{Y} = \frac{1}{\varphi}\left(1 - \frac{r}{Y/K}\right)$$

Since $\varphi > 1, \frac{r}{Y/K} < 1$ for an economically meaningful profit share. As Y/K is an index of capacity utilisation, the profit share is positively related to the degree of capacity utilisation, as Kalecki (1933A, p. 99) earlier argues. In addition, $\frac{\partial(P/Y)}{\partial Y} = \frac{rK}{\varphi Y^2} > 0$, thus demonstrating that Kalecki's explicit function for the profit share is consistent with the more general relationship drawn in Part I.

In summary there are two equations:

$$\frac{P}{Y}Y = \frac{B_o + A}{1-\lambda}$$

$$\frac{P}{Y} = \frac{1}{\varphi}\left(1 - \frac{r}{Y/K}\right)$$

and two unknowns, output and the profit share, with the capital stock given in the short period. Solving these two equations for output gives Kalecki's initial equation

$Y = q(B_o + A) + rK$, where the investment multiplier is $q = \frac{\varphi}{1-\lambda} > \varphi > 1$.[13]

This analysis clarifies the mechanism, which Kalecki does not go into, behind the conclusion of the output equation $Y = q(B_o + A) + rK$ that a rise in the capital stock, a seemingly supply-side variable, raises output in a demand-determined

system. In Kalecki's model, a rise in the capital stock, *ceteris paribus*, reduces the degree of capacity utilisation and hence puts downward pressure on profit margins and the profit share. The resulting redistribution of income causes a rise in real wages and consumption to increase the level of output.

The analysis is also consistent with Kalecki's theory of output determination under cartels, presented at the very end of the *Essay*. Here it is claimed that "in a wholly cartelised system the profit margin P/Y remains constant, i.e. output is proportional to gross profits P, and thus the former fluctuates as much as the latter" (Kalecki 1933A, p. 107).[14] In terms of the explicit profit share of Part III, Kalecki's cartels model amounts to assuming that r = 0, so that $\frac{P}{Y} = \frac{1}{q}$ and $Y = q(B_o + A)$.

While Kalecki assumes that q is positive, he does not directly make the point that to be consistent with the theory of output outlined in Part I, q must exceed unity. He does however make this assumption more explicit to derive the curve of aggregate production:

> We assume to the deviation of ± 15% of gross profitability P/K, or the value $(B_o + A)/K$, there corresponds $\frac{2}{3}$ of this, hence 10%, of the deviation in the capacity employment Y/K. This assumption seems to be broadly supported by the statistical data on social income. (Kalecki 1933A, p. 103)

This quotation implies that $\frac{P}{K} = \frac{2}{3}\left(\frac{Y}{K} - r\right)$, $Y = \frac{3}{2}P + rK$ and therefore (if $\lambda = 0$) $q = 3/2$.

Thus Kalecki's Part III model is consistent with his theory of output determination outlined in Part I of the *Essay*. Furthermore, in both Parts I and III the level of output is determined by the level of effective demand arising out of capitalists' expenditure decisions.

The only previous detailed consideration of the theory of output in Kalecki's business cycle articles has been undertaken by Osiatynski, editor of Kalecki's *Collected Works*. Osiatynski (1985, p. 98) claims that the Part III theory of output is "not quite consistent with the other assumption of the *Essay*, i.e. that relative shares are constant over the cycle" and when he re-constructs the model of short period equilibrium implied in Kalecki's *Essay* he uses this constant shares assumption (Osiatynski 1985, p. 100). On textual grounds Osiatynski is wrong; the profit share is explicitly pro-cyclical throughout the bulk of the *Essay* (Kalecki 1933A, p. 78, note 8, pp. 99-100) (excepting output determination under cartels, which comes in on the last two pages of the *Essay*). The interpretation of Kalecki's theory of output presented here differs from that of Osiatynski in remaining faithful to his assumptions and, in so doing, shows that his theories of output presented in Part I and Part III are in fact consistent.

There are however unsatisfactory aspects of the theory of output detailed by Kalecki in Part III of his booklet when he deals the impact on profits, prices and aggregate production of a balanced-budget rise in taxation. Kalecki (1933A, pp.

106-107) argues that a balanced budget increase in government spending financed by a profits tax will only raise prices, reduce the wage share and maintain the profits share without affecting output. Is Kalecki correct in his conclusion? A tax on profits of amount T implies that consumption from profits is equal to a constant amount B_o as before plus some fraction of profits after the deduction of taxes, i.e. $C = B_o + \lambda(P - T)$. The existence of government spending of amount G implies that gross profits are equal to capitalists' consumption, gross accumulation and the value of government spending ($P = C + A + G$).[15] On substituting the new consumption equation into the gross profits equation and if the balanced-budget assumption that $G = T$ is then made, then the following profits equation emerges:

$$P = \frac{B_o + A}{1 - \lambda} + T$$

The equation shows that gross profits will rise by the amount of the tax and net profits will be unaffected. Under Kalecki's previous assumptions regarding the behaviour of the profit share and his earlier theory of the determination of output, it can be shown that a balanced-budget increase in tax on capitalists' profits will raise output. A correct version of Kalecki's model for the determination of aggregate output given a balanced government budget is:

$$F(Y)Y = \frac{B_o + A}{1 - \lambda} + T$$

and the tax (or government expenditure) multiplier is:

$$\frac{dY}{dT} = \frac{1}{F(Y) + YF'(Y)} > 1$$[16]

Kalecki did not put this mistake regarding the impact of a balanced-budget increase in spending behind him until the publication of his "A Theory of Commodity, Income and Capital Taxation" in the *Economic Journal* in 1937.

4. Wage Cuts and Aggregate Production[17]

Kalecki examines the impact of a money-wage cut on real wages, aggregate production and profits in the 1933 booklet, in the 1933 rejoinder to Rajchman and the 1935 *Revue* article, but this part of his analysis is not included in the semi-translation nor in the *Econometrica* article. Regarding money wage cuts, Kalecki's basic point is that employment is determined by the goods market clearing condition. Since investment is given by previous orders, output will only change when money wages fall if the proportion of income saved alters. As the rate of profit $\frac{P}{K}$ is determined by past investment orders, and $\frac{P}{Y}$ is a function of $\frac{P}{K}$, it follows that profits per unit output (and hence the proportion of income saved) are independent of money wages under competitive conditions in the goods market. "If capitalists lower wages during depression", Kalecki argues, "[w]orkers' demand shrinks because of wage reductions. Thus the prices of consumer goods must fall,

completely erasing the advantages gained by capitalists as a whole from reductions in workers' wages" (Kalecki 1933A, p. 100).[18]

Kalecki (1933A, p. 101) reminds the reader that the conclusion that a money wage cut has no impact on output and employment may not be the case in an open economy or under cartels. Kalecki (1933A, pp. 107-8) finishes the *Essay* by considering "price rises or wage reductions in the wholly cartelized system", where prices remain constant when money wages fall, and unit profits therefore rise. Again, profits are determined by previous investment orders so there is no increase in total profits when money wages decline, but aggregate production and workers' real wages fall as the profit share rises (Kalecki 1933A, p. 108; 1933C, p. 111, p. 115). The analysis of the macroeconomic effect of wage cutting under fixed cartels' prices is also repeated in the "Essai" in similar fashion to the *Essay* and to Kalecki's reply to Rajchman (Kalecki 1935A, p. 302).

If prices remain constant after a money wage cut, Kalecki suggests that the profit share rises and workers' real incomes fall. For the goods market to clear, output must decline as the proportion of income saved has risen. Kalecki's analysis of money wage cutting in an economy partially or entirely controlled by cartels is a version of the paradox of thrift. Greater ex-ante saving generated at a given level of output leads to a fall in ex-post output until saving again equals the given level of investment. Output changes to equilibrate saving and investment. In terms of the formal version of the theory of output advanced in Part I Kalecki's analysis amounts to showing that a cut in money wages under cartels causes a rise in the profit share $F(Y)$ and thus a fall in the equilibrium level of output. In both 1933 and 1935 business cycle models Kalecki considers the equilibrating role of changes in output when real wages fall and saving rises at a given level of output.

However, Kalecki's theory of the impact of money wage cuts on output and employment under free competition or in a partially cartelized system is reliant on a strong implicit assumption for its validity. As has been noted above Kalecki (1933A, p. 70), as in all his business cycle articles, distinguishes between orders, production and delivery of investment goods, the argument being that each action of the investment process occurs in a different period of time. No explanation for why this may be the case is provided in the *Essay*, although the existence of this lag is crucial for Kalecki's theory of the business cycle.[19] Kalecki (1933A, pp. 75-76) shows that the relationship between orders and production of investment goods is approximately $A_t = I_{t-\upsilon/2}$, where υ is the average period of construction of investment goods. It is clear from Kalecki's arguments that orders are made in value terms. If an investment order cannot be swiftly and costlessly changed, an order is likely to be for a specific good at a specific price, not at what amounts to a price to be determined when the investment good is produced. However, unless the latter is the case, or Kalecki's capitalists possess perfect foresight, his conclusion that real investment and therefore production and profits are invariant to money wage changes is incorrect. Suppose an investment good is ordered on the basis of the expected price level when the investment good is produced, i.e. $E_{t \cdot \upsilon/2}(p_t)$. This implies that real gross profits are:

$$P = \frac{B_o + \frac{E_{t-v/2(p_t)}}{p_t}}{1 - \hat{\lambda}}$$

Kalecki's conclusions regarding the impact of a money wage fall on production and employment are only correct under perfect foresight where $E_t - v/2(p_t) = p_t$, or if one makes the unconvincing assumption that investment orders are made by capitalists at a price to be determined when the good is produced. If the wage cut was not anticipated in contracts for the order of investment goods, lower money wages would raise output and employment.[20] Kalecki does not appear to be aware that his conclusions require this strong perfect foresight assumption.[21]

5. Patinkin on Kalecki's Business Cycle Theory

Patinkin (1982, pp. 63-71) explicitly considers Kalecki's business cycle models in *Anticipations of the General Theory*?, examining this part of his work in depth to see whether it contains the central message of equilibrating changes in output.

Patinkin argues "from the cycle in production of investment goods, Kalecki proceeds to the cycle in aggregate production. But he does not seek to analyze the latter cycle in a rigorous fashion" (Patinkin, 1982, p. 67) and proceeds with a quote where Kalecki (1933A, pp. 78-79) describes how a rise in gross accumulation causes a rise in output and employment, causing profits to rise by an amount equal to the rise in investment and capitalists' consumption. Yet in this section of Kalecki's *Essay* he *first* analyzes the cycle in aggregate production and *goes on* to examine the multiplier proces of a change in investment raising aggregate production from one level to another. Kalecki's analysis of the impact of a rise in investment on the level of aggregate production in Part I is presented in a rigorous fashion, but not mathematically.

Patinkin admits that some have argued that Kalecki's business cycle theory does contain the concept of the equilibration of saving and investment through changes in output, but he has a number of reservations regarding these arguments. First, he argues that the proposition that investment increases output to increase saving goes back in rigorous form to Kahn's multiplier article and does not therefore constitute the theory of effective demand. Second, in the quoted passage Kalecki, Patinkin suggests, was primarily concerned with demonstrating that a rise in investment causes a rise in saving and not with the equilibrating effects of changes in output. Kalecki's major purpose in demonstrating this was "to rigorize the teachings of Marxian economics about... two basic and associated features of the capitalist economy: the relation between investment and profits, and the generation of investment cycles" (Patinkin 1982, p. 68).

Patinkin provides no evidence that "rigorising" Marxian economics was Kalecki's aim. Nowhere in Kalecki's (1933A) booklet does he refer to Karl Marx or Marxian economics. Nowhere does Kalecki use Marxian value aggregates, as was typical amongst Marxian political economists, in attempting to explain the macrodynamic features of the capitalist economy. Nowhere does Kalecki (1933A)

discuss or even mention Marxian concepts such as the labour theory of value, the falling rate of profit and the reserve army of labour (the last is however mentioned in a footnote in Kalecki 1935A, p. 296, note 9; 1935B, p. 136, note 8). None of the economists referenced in Kalecki's business cycle works are Marxists.[22] The only linkage, which is implicit, with Marxist thinking is the division between workers (who do not save) and capitalists. Kalecki does not attempt to link his theoretical work into any tradition of economic thinking, apart from Aftalion's theory of the business cycle. It is also suggestive that Kalecki's theory of the business cycle came under strong criticism from the Marxists in Poland, particularly regarding Kalecki's conclusion that the wage struggle under free competition cannot affect real wages (see editorial note, Kalecki 1990, p. 443, p. 478).

Patinkin plays up Kalecki's failure in his 1936 review of the *General Theory* (where he claims to have anticipated important elements of Keynes's work) to:

> indicate that what he calls "the Keynesian multiplier" was actually (as Keynes himself emphasized) "first introduced into economic theory by Mr. R. F. Kahn in his article on 'The Relation of Home Investment to Unemployment' (*Economic Journal*, June 1931)" (GT, p. 113); that Kahn (and after him Keynes) had not sufficed with a general description of the multiplier as dY/di [sic] = $f'(I)$, but had demonstrated that it had the form dY/dI = 1/(1 - MPC), thus establishing a precise quantitative relationship between the level of investment and that of output; and that the main message of Kahn's article had been that an increase in investment would generate an increase in savings. And I do not think that it is mere chance that Kalecki's mention of these facts would have greatly weakenend the implicit claims for priority which he presents in the two footnotes of the preceding passage [in Kalecki's review of the *General Theory*, Kalecki 1936A, p. 228].

Patinkin (1982, p. 75 and also p. 75, note 2) writes of Kalecki's "attempts to play down the importance of Kahn's multiplier", of the fact that "references to Kahn's 1931 article are conspicuously absent" from Chapter Two, entitled Investment and Income, of Kalecki's *Essays in the Theory of Economic Fluctuations*, and "of other indications in this 1939 chapter of an attempt to ignore Kahn's multiplier." The impression that Patinkin gives is that Kalecki's business cycle discussion of the relationship between investment and aggregate production amounts to no more than Kahn's 1931 multiplier article, that Kahn's multiplier demonstrates precisely that dY/dI = 1/(1 - MPC) and Kalecki's did not, that Kalecki did not establish a precise quantitative relationship between investment and output and that Kalecki deliberately attempts to play down the importance of Kahn's multiplier in his post-1936 work since it seriously weakens his claims for anticipation of Keynes. All these impressions are misleading.

Is Kalecki's analysis of saving and investment no more than Kahn's? In 1933 Kalecki was working in a framework within which investment is defined to be equal to saving (which are made solely from profits), so the goods market clears in any short period, and investment and saving cannot be coordinated through the interest rate (since investment is predetermined and saving depends only on the level of profits which depend in turn on the level of output). On the other hand Kahn's

multiplier is, as Patinkin (1982, p. 28) himself acknowledges, developed "within the conceptual framework of Keynes' *Treatise*". In other words, Kahn is still operating within the *Treatise* definitions where saving exceeds (or falls short of) investment if the interest rate is above (or below) its equilibrium level by the amount of windfall losses (or profits). Both saving and investment depend on the rate of interest and the goods market clears via interest rate rather than output variations. An explanation of why a change in investment causes an equal change in saving through a rise in production therefore is a theory of output changes clearing the goods market in Kalecki's framework while it cannot be in Kahn's. Indeed, Kahn (1984, pp. 100-101) admits that he was "handicapped" by the *Treatise* definitions in the 1931 article and that the move to defining saving and investment as identically equal which occured after the multiplier article was a conceptual breakthrough of some importance in the Cambridge journey away from the *Treatise* and towards the General Theory.

To argue that Kahn demonstrates that the multiplier is $dY/dI = 1/(1 - MPC)$ is also misleading. When Patinkin (1982, pp. 26-30) discusses Kahn's multiplier in the context of the *General Theory*, he argues that this was not the way that Kahn presented the multiplier in his 1931 article (Patinkin 1982, p. 26) and he furthermore suggests that there is strong evidence from letters between Keynes and Kahn during 1931 and 1932 that Kahn did not himself understand his multiplier article in this way (Patinkin 1982, pp. 29-30). As Cain (1979) points out, Kahn's is an employment rather than a national income multiplier and the principle leakages are reductions in transfers, rises in imports and increases in unspent profits, not a 'Keynesian' marginal propensity to save (1 - MPC). Patinkin (1982) plays up the content of Kahn's multiplier when discussing Kalecki's work, consequently reducing Kalecki's originality, and plays it down when it concerns Keynes, consequently minimising Kahn's contribution to the *General Theory*.

Patinkin's interpretation of Kalecki's failure to refer to Kahn as his attempt to play down the role of the multiplier in order to boost his claims for anticipating Keynes is also open to objection. Throughout his career Kalecki rarely referred to the work of others; he was self-taught in economics and did not possess the citation practices now considered normal. On the matter of Kalecki's failure to cite Kahn, Patinkin's case rests on weak grounds. In addition, Patinkin again to the contrary, (as has been argued above in section 3) Kalecki does establish "a precise quantitative relationship between the level of investment and that of output" in the *Essay*, both in literary and related mathematical fashion in Parts I and III.

Regarding Kalecki's analysis of money wage cuts, Patinkin (1982, pp. 76-77) rightly argues that his analysis of the impact of a wage decline on the level of output is inferior to the detailed analysis of Keynes. It is true that Kalecki's analysis is rather mechanical in assuming - under competitive conditions - that output and employment are determined solely in the goods market by exogenous investment, especially in comparison to the subtle treatment of the same set of issues in Chapter 19 of the *General Theory*.[23] However, as Robinson (1966) points out, Keynes did not examine the case of a reduction in money-wages under cartelised conditions leading to a reduction in real wages and the resulting impact on consumption, output and employment, which Kalecki does analyse.

6. Conclusion

Does Kalecki's pre-1936 business cycle work contain the theory of effective demand? There are two places in his cycle publications where Kalecki's analysis suggests the theory of effective demand, the first when he considers the relationship between investment and aggregate production and the second where he examines the question of money wage cuts.

Regarding the determination of the level of production, the theory of effective demand is clearly stated when Kalecki, after defining investment equal to saving, shows that a rise in investment raises saving by an equal amount via changes in the level of production to clear the goods market. This model of output determination is presented in Part I and repeated (but with an explicit function for the profit share) in Part III. The purpose of the analysis of output in Part III is to derive an approximate curve of aggregate production over the cycle to compare with the amplitude of similar curves for profits and gross accumulation. However, Kalecki's treatment of the relationship between the level of aggregate production and balanced-budget increases in government spending is inconsistent with theory of effective demand. As the analysis of balanced-budget government spending appears in Part III, "Applications", of the *Essay* and does not reappear in the other business cycle articles, it does not represent a central element in his work.

In Kalecki's analysis of wage cutting, production is determined by the level of effective demand, driven by investment. When wages fall, profits and saving will only rise if capitalists increase their spending by the amount of the wage reduction. Since investment is given and capitalists' consumption is determined by investment, a wage cut causes an equivalent price fall and no production change. If prices are sticky due to the dominance of cartels, for the goods market to clear in the face of what is a rise in the propensity to save, output and employment must fall. Again, here is the theory of effective demand. The role of changes in output in clearing the goods market when real wages fall is dealt with in the *Essay*, in Kalecki's (1933C) reply to a critique of the *Essay* and in the "Essai", suggesting it is an important part of his thinking.

In cases of his descriptions of the impact of changes in investment and changes in money wages on output, Kalecki does not include the capacity-creating effects of investment as part of the analysis. The analysis is therefore an exercise in short period comparative statics and indicates that in Kalecki's theory of the business cycle the theory of effective demand determines the level of output for a given capital stock.

While one can find the short-period static theory of effective demand used at several points in the *Essay*, and while the theory underpins the mechanism of his business cycle models, it is not, as Patinkin and others have suggested, in itself the main message of Kalecki's work.

The main concern of Kalecki's *Essay* is the analysis of the interaction of the theory of effective demand with the theory of investment, where investment functions as both the driving component of effective demand and a creator of productive capacity. This interaction, Kalecki believes, gives rise to cycles in

profits, investment, the capital stock and output. In analysing the business cycle in this manner, Kalecki presented the first logically consistent and mathematically determinate macrodynamic "Keynesian" model of the cycle[24] - three years before the Keynes published the *General Theory*. In some senses therefore, Kalecki's *Essay* rendered the *General Theory* obsolete even before its publication.

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NOTES

1 The entire debate regarding Kalecki's anticipation of Keynes is critically surveyed in Chapple (1994, forthcoming).

2 I have already examined this question in some detail with respect to two of Kalecki's other pre-1936 articles in Chapple (1991). My conclusions regarding Kalecki's business cycle work and the General Theory have changed somewhat since studying the translation of Kalecki (1933A) in volume one of his collected works (Kalecki 1990).

3 It is worth mentioning that while Asimakopulos (1983) believes Kalecki and Keynes overlap regarding their emphasis on and analysis of investment, he accepts Patinkin's conclusion that Kalecki was not in possession of the theory of effective demand prior to 1936.

4 The conference is reported on by Marschak (1934) in English and Lutfalla (1934) in French.

5 Apparently towards the end of 1932 Kalecki translated the *Essay on the Business Cycle Theory* into German and sent it to a German socialist for possible publication. Unfortunately this potential publisher had to flee to escape the Nazis. Kalecki then sent a copy of the manuscript to Keynes early in 1933. According to the secretary at the Institute for the Study of Business Cycles and Prices, the manuscript was returned with a note attached from Keynes indicating that he did not read German (editorial note, Kalecki 1990, p. 444). Mitra (1986) has taken this as evidence of some duplicity on Keynes's part, a charge firmly and persausively rebuffed by Bhattacharjea and Raghunathan (1988).

6 Kalecki's claim is not strictly true. References to price changes in the original *Essay* are suppressed in the translation and typically replaced with references to profit per unit output. The editorial notes in Kalecki (1990, pp. 467-72) detail the changes between the synthetic semi-translation and the original booklet. Profit per unit output will move in the same direction as the level of national income even if prices are constant if labour is hoarded over the business cycle, a point recognised in the synthetic semi-translation (Kalecki 1933B, p. 13, note 4) but not in any of the original pre-1936 articles on the business cycle, suggesting that this was a post-1936 addition to Kalecki's thinking.

7 Kalecki's *Collected Works* (1990) do not present the entire text of the 1935 *Revue d'Economie Politique* article in translation, merely noting and translating the differences between this article and the three others where they arise. Unfortunately not all the

differences are noted, and other aspects of the treatment and translation of this article are unsatisfactory.

8 Patinkin (1982, p. 65, p. 65 note eleven) incorrectly claims that the implicit assumption is a balanced budget rather than no government sector, as has been suggested here. Patinkin is incorrect because if a government sector existed, taxing profits to finance expenditure, then Kalecki's equation for gross profits should correctly read $P = C + A + T$, where T is the tax take, equal on the balanced budget assumption to government spending G.

9 The theory of the business cycle and its turning points presented in the *General Theory* (Keynes 1936, pp. 253-4, see also p. 251 for similar statements) is strikingly similar (if less formally elegant) to that advanced by Kalecki in his *Essay*.

10 This proposition can be proved formally. As $P + W = Y$, $dP/dY + dW/dY = 1$, where W is wage income. It follows that $dP/dY = d[YF(Y)]/dY = F(Y) + YF'(Y) < 1$.

11 Note that in the translation of Kalecki (1933A, p. 104, Figure 8) that the notation from the original Polish booklet is mistakenly preserved in Figure 8 and does not correspond with that used in the text. In particular Z from the original Polish work is used for profits P and P for aggregate production Y.

12 For multiplier effects $dP/dY = 1 - dW/dY = 1/\varphi < 1$.

13 Patinkin (1982, p. 69) plays down this theory of output determination as ad hoc. This is a weak criticism given that assumptions which could equally be considered as ad hoc underly his own formulation of the General Theory in terms of the "Keynesian cross" model. All that can be said about Kalecki's assumption that the profit share increases with the level of output is that it lacks microeconomic rigour.

14 The assumption that the profit share is fixed is based on there being no changes in money wages. If wages fall, the profit share will rise, because cartels' prices are sticky (Kalecki 1933A, p. 108; see also 1933C, p. 111, p. 115, 1935A, p. 302, p. 304, 1935C, pp. 189-90). Kalecki's empirically based assumption that cartels' prices were sticky in the face of declines in money wages is supported by data on cartels' prices in Poland during the 1930s (Landau and Tomasewski 1983, pp. 92-3).

15 In effect, Kalecki makes the same accounting mistake as Patinkin (1982, p. 65). See footnote 8.

16 Since $Y = P - T + W + T$, and net profits are unchanged by a tax on profits, it follows that $dY/dT - 1 = dW/dT > 0$ and the wage bill increases with a profits tax.

17 Kalecki's (1935C) analysis of money wage cutting is not considered here because it is not one of his formal business cycle articles. For a discussion of the article, see Chapple (1991).

18 Kalecki ignores any future feedback from the money market to the goods market, despite assuming that investment orders are functionally dependent on the rate of interest.

19 Kalecki (1937A, pp. 534-5) does provide a more detailed explanation for the production lag in his *Review of Economic Studies* article on the business cycle.

20 This limitation of Kalecki's theory of the economy-wide impact of a money wage cut has not been analysed in detail before in the literature (see for example Reynolds (1987, pp. 127-30), who, while discussing Kalecki's theories on wage cutting, shows no awareness of the issue). It has drawn one passing reference by Sawyer. Regarding the lag between investment decisions and production of investment goods Sawyer (1985, p. 49) writes:

> investment decisions are intended to be implemented at some stage in the future, and the actual expenditure depends on the course of prices in the intervening period (and on the nature of the contract for investment goods, e.g. whether fixed in nominal price terms). A factor which could lead to a dislocation between decisions and implementation would be unexpected inflation.

If investment decisions are set in nominal terms, as Sawyer seems to be implying above, this implies that capitalists' pricing decisions and profit realization, even in a simple world with no foreign sector, no government and no workers' savings, are interdependent.

21 In defense of Kalecki, it might be argued that he was concerned here with showing logical inconsistencies in the prevailing view that wage cuts during a depression would eliminate unemployment. The prevailing theory, it might be suggested, presented a model based on perfect foresight. This is highly unlikely to be the case, for a number of reasons. First, in no place does Kalecki make the point that he is critiquing the internal logic of an opposing theoretical view. Kalecki also shows no awareness that perfect foresight is necessary to generate the results. As an assumption, perfect foresight only becomes an important part of mainstream macroeconomics with the arrival of rational expectations in the 1970s. Mainstream macroeconomics prior to rational expectations and adaptive expectations (i.e. at the time when Kalecki is writing), relied on the assumption of static expectations. Finally, Kalecki uses exactly the same arguments in considering the impact of a money wage cut on output and employment in his later work when the pricing assumption is his own theory of markup pricing, suggesting again that his arguments in the *Essay* are not intended to logically critique the prevailing macroeconomic theory.

22 The *Essay* (Kalecki 1933A, pp. 67-8) begins by quoting and discussing Albert Aftalion's *Les crises périodiques de surproduction* (1913, p. 401) and Aftalion (1913, p. 372) is further cited in a footnote on page 104 and in the text (pp. 104-5). The *Essay* refers to Jan Tinbergen's (1931) "beautiful study of the shipbuilding cycle" (Kalecki 1933A, p. 68) regarding the mathematical solution for the model (pp. 83-5). There is also a reference to W.I. King (Kalecki 1933A, p. 89) regarding national income accounting magnitudes but no work is specified. It would seem that the unsupplied reference is to King's (1930) book. The "Essai" opens with references to Aftalion and Bouniation (Kalecki 1935A, p. 285) and refers elsewhere to Aftalion (1913) (Kalecki 1935A, 305, note 11) and Cournot (Kalecki 1935A, p. 300, note 10). The *Econometrica* article refers to Frisch (1933) regarding the use of "macrodynamic" in the title of the paper, Tinbergen (1931) regarding the mathematical solution (Kalecki 1935B, pp. 126-8) and King, again without mentioning the source (Kalecki 1935B, pp. 131-2). The synthetic semi-translation contains no references to anyone. The interesting thing about Kalecki's citation practices in his early business cycle articles is that here, as in the rest of his career, citations are sparse and often a name is cited without reference to a specific work. Kalecki also adapts his citation practices to his audience, citing Aftalion, Bouniation and Cournot to a French language audience and Frisch and Tinbergen to an audience of *Econometrica* readers.

23 Simply because an analysis is mechanical does not mean that it does not anticipate the General Theory. Patinkin's (1982, p. 10) summary definition of the central message of the *General Theory* is entirely mechanical.

24 "Keynesian" is used in the sense of being based on the principle of effective demand, as were similar post-1936 business cycle theories developed by Harrod, Lundberg, Samuelson, Kaldor and others.

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