Fundamental Errors in Keynesian Multiplier Theory and Cross Diagrams

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Abstract

Keynesian multiplier theory is misconceived mathematically and diagrammatically in that: (1) Keynes's derivation of the multiplier involves (a) an arbitrary distinction between consumption and investment, (b) an arbitrary choice of causality between investment and consumption, and (c) circular logic; (2) Keynesian cross diagrams contain false shifts of the expenditure schedule and unfounded assumptions concerning its shape; (3) Construction of these diagrams reflects poor understanding of the meaning of equilibrium and the time taken to reach it; (4) The marginal propensity to consume is neither definable at equilibrium nor predictable away from it; (5) Saving is not a leak and the true expenditure function is the 45-degree line. It is concluded that there is an urgent need to purge macroeconomic pedagogy of Keynesian cross diagrams and IS-LM analysis except as historical relics of professional error.

Keywords: Keynesianism, macroeconomics, multiplier theory, cross diagrams, IS-LM analysis.

1 Introduction

The political success of *The General Theory of Employment, Interest and Money* (Keynes, 1936) in the mid-20th century did not derive from its clarity of exposition. On the contrary, it is widely acknowledged that Keynes's style and meaning are frequently obscure, affording Keynesians their many subsequent opportunities to enlarge upon what they deemed Keynes to have meant. While this led some Keynesians to become more 'Keynesian' than Keynes, *The General Theory* itself remained poorly digested by succeeding generations of economists. Indeed, today's schools of economics are increasingly staffed by teachers who have neither read, nor specifically intend to read, *The General Theory*.

Rather, the political success of *The General Theory* derived from the belief system it created—the belief that tools had been discovered whereby governments could make a difference by acting intelligently for the general good. Essential to this belief system was the idea that governments could discern and use these tools wisely only if they were properly advised by academic economists. As Keynes's latest biographer has noted, economists and governments came to believe "that Keynes had given them the tools to prevent large-scale fluctuations in demand from occurring in the first place, or reversing them quickly when they did occur" (Skidelsky, 1996, p.87).

There is perhaps no better-known example of these Keynesian tools than the investment multiplier, an entity that, in a world struggling to overcome the tragic privations of the Great Depression, offered governments a beguilingly easy solution to the problem of chronic

unemployment. It is the purpose of the present paper to show that Keynes's investment multiplier is fundamentally unsound, improperly derived and operationally vacuous.

This paper is particularly timely for the current political situation in which some governments are seeking Keynesian remedies to the economic ills deriving from the global financial crisis. It reiterates some earlier, largely unheeded criticisms of Keynesian theory and presents arguments that offer fresh insights together with an important new identification of error in Keynesian cross diagrams.

2 Critical Context

The promulgation of Keynesian error in macroeconomic pedagogy up to the beginning of the present century has been well described by Ahiakpor (2001) in a paper entitled *On the Mythology of the Keynesian Multiplier: Unmasking the Myth and the Inadequacies of Some Earlier Criticisms*. This paper provides a useful summary and historical review of past criticisms that have been specifically directed towards the concept of the Keynesian multiplier.

Ahiakpor (2001, p.746) notes that

> Keynesian multiplier analysis has become a staple in macroeconomic education at the introductory and higher levels, without students being warned of the concept's fundamental misrepresentation of how an economy works.

Ahiakpor's criticism rests mainly on Keynes's failure to recognise the concurrent nature of consumption and production. This failure led Keynes to claim a bogus primacy for consumption in determining national income. Contrary to the Keynesian analysis, Ahiakpor (2001, p.747) states:

> No one consumes without first having earned income from production or borrowed someone else's income. …

> The income generation process in an economy is a concurrent one, not the unidirectional process described in the Keynesian multiplier story. …

> Saving (not the hoarding of cash) is not a leakage from the income-expenditure stream; it is the main source of investment finance.

Ahiakpor's (2001) overview of previous criticism of Keynesian multiplier theory lists papers by various economists including Pigou (1941 [1979]; 1933 [1968]), Robertson (1936), Hawtrey (1950; 1952), Hazlitt (1959), Haberler (1960) and Hutt (1974 [1979]). Ahiakpor (2001) discusses each of these criticisms in turn and notes that they largely fail to focus on one or more of the three crucial points quoted above which form the essence of Ahiakpor's objection to Keynesian multiplier theory.

While concurring with the specific points raised by Ahiakpor (2001), the present author notes that nobody has yet made a comprehensive attack on the mathematical and conceptual validity of *both* Keynesian multiplier theory *and* its representation in Keynesian cross diagrams. This approach is important, for if an idea is basically misconceived, the chances are that its mathematical and diagrammatic expressions will contain and, on analysis, reveal the underlying problem. Furthermore, a direct attack on the algebra of multiplier theory and the geometry of cross diagrams is urgently needed, given the fact noted by Ahiakpor (2001, p.746), that previous criticisms have reaped "hardly any success in limiting its [Keynesianism's] widespread acceptance and teaching in macroeconomics."

We shall return to discuss some modern textbook examples in due course, but first let us turn to the original writing of John Maynard Keynes (1936).

3 Objections to the Algebra of J. M. Keynes

In the chapter devoted to the marginal propensity to consume, Keynes (1936, p.113) writes:

> In given circumstances a definite ratio, to be called the *Multiplier*, can be established between income and investment and, subject to certain simplifications, between the total employment and the employment directly employed on investment (which we shall call the *primary employment*).

and then (p.115)

> Let us define, then, $\dfrac{dC_w}{dY_w}$ as the *marginal propensity to consume*.

> This quantity is of considerable importance, because it tells us how the next increment of output will have to be divided between consumption and investment. For

$$\Delta Y_w = \Delta C_w + \Delta I_w,$$

> where ΔC_w and ΔI_w are the increments of consumption and investment; so that we can write

$$\Delta Y_w = k\Delta I_w,$$

> where $1-\dfrac{1}{k}$ is equal to the marginal propensity to consume.

> Let us call *k* the *investment multiplier*. It tells us that, when there is an increment of aggregate investment, income will increase by an amount which is *k* times the increment of investment.

3.1   Arbitrary Distinction between Investment and Consumption

In choosing to call investment the primary employment, Keynes (1936) is depending on an arbitrary distinction between investment and consumption—a distinction that is wholly unsupportable whether referred to the facts of economic life or whether referred to Keynes's own permissive attitude toward useless public works.

The distinction between a capital good and a consumption good ultimately rests on the intent of the purchaser, i.e., whether the good is purchased for current consumption or as an input to further production. While some goods are almost always used for consumption (e.g., food) and others are almost always used for production (e.g., airships), the fact is that a continuum of goods exists between such extremes, and even at the extremes the distinction is rarely absolute.

A further difficulty attends this distinction when we consider the psychological notion of the marginal propensity to consume (*MPC*). For consumers it is perhaps straightforward in that individual agents decide that their current income will be either spent on current consumption or saved for future use; in that sense it is reasonable to conceive of a psychological mean for an economy in a given equilibrium or non-equilibrium steady state (see section 3.5.1.2) that measures the *average propensity to consume* (*APC*) for consumers in the aggregate and has a distribution of individual *APC* values about that mean ranging between miser[1] and spendthrift.   On the other hand, individual firms tend to specialise in producing certain types of goods; one might specialise in bread-making, another in building airships, while another might produce a range of goods having different probabilities of being purchased for current consumption or as inputs to further production. A firm staffed by 100 workers who as consumers have a mean *APC* of 0.8, may be producing goods having a 99% probability of being purchased as capital goods by other producers. Only in a perfectly adjusted market economy will the aggregate of all firms be producing goods in the exact quantities and qualities desired by the purchasers (whether for current consumption or for future production)

such that the total production of goods for current consumption, as a fraction of aggregate production of all goods, is equal to the *APC*.[2]

It is important to pay close attention to this Keynesian distinction between capital goods and consumption goods, for in Keynesian economics we are purportedly dealing with prescriptions for economies that are far from perfectly adjusted. Thus, when Keynes (1936, p.115) says that the *MPC* "tells us how the next increment of output will have to be divided between consumption and investment" he is apparently speaking of the *output* of producers. It is not at all apparent how a Keynesian 'investment'[3] stimulus could prompt producers in the aggregate to tune their outputs in exquisite balance with the appetites of the recipients of the newly created income, given that the primary justification for the Keynesian stimulus is the pre-existing chronic state of market imbalance.

3.2   Arbitrary Choice of Causality

There is no doubt that Keynes's algebraic derivation of the multiplier expresses a claimed causal relationship between investment and income and seeks to give it quantitative precision. However, the mathematical relationships do not, in themselves, depend on a causal directionality between investment and income. One could just as readily, and just as arbitrarily, call *non*-capital production the *primary* employment that generates income, some of which can be set aside for investment. Thus, we now run into the problem of defining 'primary employment'.

Even if it were possible to distinguish unequivocally between investment and consumption, this would still not tell us which of the two should be regarded as *primary* and the other as *secondary*. Contrary to *The General Theory*'s predominant view of investment as primary income, Keynes (1936, pp.125-6) gives a detailed numerical example that would support the view that *consumption is primary* and common to all economies, rich and poor. Keynes proposes a community—employing 5 million men "on its existing capital equipment"—as having an *average* propensity to consume equal to 100%. He then proposes that, in employing the next 100,000 men, the community's *marginal* propensity to consume is 99%, then 98% for the output generated by the next 100,000 men, and so on. However, this example is falsely drawn; such a community would be living at subsistence levels, with neither capital equipment nor specialised division of labour. Only as a community begins to rise above subsistence levels does the prospect of saving and investment become an option as a *secondary* luxury as division of labour both permits and requires saving and investment. In this sense (i.e., the sense that subsistence *precedes* specialisation and the division of labour), consumption may be conceived of as *primary*; however, this author sees no merit in attaching any further significance to the word *primary* in seeking to understand the distinctions and relations between consumption and investment.

Thus, Keynes's (1936) assumption that investment is *primary* is unproven and is implicitly contradicted by him in the above example. And, as we shall discuss in section 3.5.1.1 (see under the heading 'What happens when the government prints money to fund an employment stimulus?'), the promise of Keynesian multiplier theory does not depend on the production of real capital goods issuing directly from a Keynesian 'investment' stimulus. Hence, the identification of investment as *primary* is neither proven nor necessary, exposing immediately the circular logic in the algebra.

3.3   Circular Logic in the Algebra

The circularity of reasoning is as follows:

1. Aggregate income/employment is split arbitrarily into investment (*I*) and consumption (*C*).

   See section 3.1 above.

2. It is further decided arbitrarily that investment is *primary* income/employment.

   See section 3.2 above.

3. A marginal propensity for income to be spent on current consumption, i.e., the marginal propensity to consume (*MPC*), is arbitrarily conceived and defined without proper concern as to whether such a concept is measurable or even definable in practice, or whether it can be considered immutable in the face of a shock.

   See section 3.4 below.

4. It is implicitly assumed that any income saved is all invested (otherwise an expenditure-income equilibrium could not be achieved before or after the shock).

5. Emphasis is now placed on the truism (given 1 and 3) that any increase in aggregate income, ΔY, will be spent on increased current consumption as

$$\Delta C = MPC \cdot \Delta Y \qquad (1.1)$$

   and will be saved *and invested* as

$$\Delta I = (1 - MPC) \cdot \Delta Y \qquad (1.2)$$

The crucial error will now appear in procedures 6 and 7 below, in which it is assumed that the above suppositions will all remain true in the face of a perturbation in *Y* that is *forced* upon the system purely as ΔI.

6. Next, an authoritarian[4] (*i.e.*, forced *and independent of MPC on which it has no effect*) increase in investment *expenditure* (ΔI) is proposed, thereby raising aggregate expenditure by ΔI. At this point no mention is made of the fact that the authoritarian expenditure increase also determines an increase in aggregate *income* equal to ΔI; *i.e.*, the 'shock' of the forced condition is

$$\Delta Y = \Delta I.$$

7. Depending on a falsely circular reversal of equation (1.2) in point 5 especially, along with points 1 to 4, it is claimed that the forced ΔI will determine a new equilibrium displaced from the old equilibrium by $\Delta Y = k.\Delta I$, where $MPC = (1 - 1/k)$. The implication of this circular logic is that autonomous individual agents in the economy, on detecting that the economy has been 'shocked' into having an abnormally high proportion of investment spending occurring, will increase their individual consumption until the increment of aggregate consumption has outrun the new investment spending by the factor *k*. Neither the mechanism of detecting the 'shock' by individual agents nor the means and mechanism whereby they subsequently pursue the goal of collectively arranging their new consumption to outrun the 'shock' by the factor *k* is in the least bit apparent.

8. Finally, *k* is called a *multiplier* and proclaimed to the world at large as a purported policy instrument for dealing with unemployment.

Points 1 to 8 above are the essence of the basic justification for Keynesian interventionism. Even though such interventionism is founded on intellectual quicksand, therein lies the *purpose* of the multiplier analysis. The theory is invalid because it assumes that consumption spending will always outrun investment spending by the multiplier ratio, *k*, regardless of whether the investment spending is comprised purely of the economy's psychological propensity to invest or whether it has been forced on the economy through authoritarian governmental action. In the latter case—the classic textbook case of a Keynesian authoritarian investment stimulus—the alleged multiplier effect fails on three grounds:

- neither means nor mechanism exists (within the theory) for individual consumers to discern and compensate for the authoritarian investment shock;

- there is no basis for assuming a 'primary' driving role for investment spending that will determine a Keynesian multiplier effect;

- Keynesian belief asserts that the 'investment' shock need not involve investment goods at all—any kind of stimulus will do, be it investment, consumption[5] or the mere printing of money, provided that it is authoritarian. This leaves the circular logic in Keynesian algebra totally exposed for what it is, i.e., it is both logically and mathematically inadmissible.

Now there is nothing particularly novel or original in the above line of criticism. Aspects of it have been noted often enough before (e.g., Hazlitt, 1959; see Ahiakpor, 2001) but without having any appropriate effect as judged by the current state of macroeconomic pedagogy. For those who find genuine difficulty in perceiving the circular reasoning and false causality in this process it might be useful to draw a patently absurd analogy. Suppose there exists an island community in which the average propensity to be right-handed is 80%, the remainder of the population being left-handed (for simplicity, we shall assume ambidexterity to be non-existent). Suppose that the island government decides that it would be desirable to increase the population rapidly by 50% but cannot afford to fund an immigration program beyond that which would produce a 10% increase. A Keynesian solution to the problem would be to regard left-handers as *primary* persons, whose presence in a population determines that they will always be found in the ratio 1:4 relative to *secondary* persons (the right-handers). The government's desired, but apparently unaffordable, immigration problem is thus solved by sponsoring the immigration of pure left-handers. The average propensity of the population to be right-handed would then be hoped to assert itself by miraculously attracting four new self-funded right-handers for each of the imported left-handers, thereby producing the desired 50% increase in population. The final touch to this Keynesian vignette would be to suggest that the speed with which this would happen would depend on the extent to which the government's left-handed immigration initiative was foreseen by right-handed aliens.

3.4 The Marginal Propensity to Consume (*MPC*) is neither Definable nor Predictable

Leaving aside for the moment the total invalidity of the algebraic logic underlying Keynesian multiplier theory, is there such a thing as a properly definable and measurable marginal propensity to consume (*MPC*)?

We begin by noting that the *MPC* cannot be defined at equilibrium; perhaps the *average* propensity to consume could possibly be estimated from the equilibrium condition that the time rate of change of the aggregate capital stock (*K*) is zero, i.e.,

$$\frac{dK}{dt} = 0$$

where *t* is time.

Under this condition, the average propensity to consume would (by Keynesian argument) be given by the proportion of aggregate expenditure *not* used by producers for maintenance of the capital stock. However, this could not form a basis for making confident predictions about the *marginal* propensity to consume as will now be discussed.

Ideally, a Keynesian investment 'shock' will be initially manifest as a sudden increase in employment in the capital goods-producing sector. Such increased employment could be realised in any of the following ways: it could be recruited either

- entirely from the ranks of the unemployed,

- entirely by requiring existing employees to work longer hours, or

- by a combination of these two forms of recruitment.

Our task is to find what Keynesian *MPC* would logically attach to the new employment under these three different conditions.

Firstly, consider the case where the increased employment derives entirely from enlistment of previously unemployed persons. Prior to their employment, they would have been living entirely on welfare (including charity) with a probable *average* propensity to consume close to 100%. On becoming employed, they are in a position to decide how to handle the excess of their new earnings over their former welfare income. What will they do? Will they be so fearful of the prospect of future unemployment that they will save every extra dollar earned, making their *MPC* equal to zero? Or will they eat, drink and be merry pending the next bout of unemployment, making their *MPC* equal to 100%? Whatever the answer to this question might be, it cannot be divined from the *average* propensity to consume of the *employed* population at the pre-'shock' equilibrium.

Secondly, consider the case where the increased employment derives entirely from moving existing employees onto overtime. What will they do with their extra disposable income (after deduction of high marginal rates of progressive income tax)? Will they consider their erstwhile saving arrangements to be adequate and not requiring adjustment, making their *MPC* equal to 100%. Or will they seize the opportunity to do some really serious saving, making their *MPC* equal to zero? Or will they decide with mathematical precision to make their *MPC* equal to their pre-'shock' *average* propensity to consume? Only in the last and, arguably, least likely scenario will there be any information allowing a quantitative prediction of the *MPC* for these overtime workers.

Thirdly, in the more likely event that the increased employment in the investment goods sector derives from a combination of the above two extremes, the above uncertainties about the *MPC* are merely compounded.

It may be safely concluded that no *MPC* relevant to the case of an investment 'shock' can be predicted from information existing at the equilibrium prior to onset of the 'shock'. Therefore, even if a Keynesian investment multiplier existed on Keynesian terms (which we have already shown to be false and inadmissible) there is no way of estimating or predicting its magnitude either at equilibrium or away from equilibrium. Given that the marginal propensity to consume is undefinable at equilibrium, and unpredictable away from equilibrium, the drawing of rectilinear expenditure schedules in Keynesian cross diagrams (see Figure 1) is utterly without foundation. It cannot even be defended as a simplifying assumption; this is because the limiting slopes of such schedules at equilibrium are indeterminate.

While the above arguments re-echo some earlier criticisms of Haberler (1960, pp.222-232) and Robertson (described by Presley, 1979, pp.169-176) they are more vigorously pursued here, being unconstrained by any political necessity or desire to salvage anything either from *The General Theory* in particular or from contemporary macroeconomics in general. However, they need restating with the above precision because they have hitherto had no appropriate impact on the foundations of modern macroeconomic pedagogy.

3.5 Defining a Multiplier Scenario

It is recognised that Keynesians' expected extent of the multiplier effect is determined by the method in which the authoritarian expenditure increase is funded. For example, increased government spending is held to produce the full multiplier effect if it is funded by printing money whereas the multiplier is unity if it is funded by increased taxation (balanced budget multiplier = 1).

While this paper rejects the validity of the Keynesian investment multiplier, it is important to observe that a so-called balanced budget multiplier equal to unity must, according to Keynesian arguments, obtain for *all* scenarios whereby the primary increase in authoritarian expenditure does not involve the printing presses. For all scenarios in which the printing of money is not involved, one of the following must happen:

- the government must tax the community,

- the government must borrow from the community,

- private enterprise or government must invest in one sector of the economy at the expense of investment in another sector, or

- the economy must manifest an autonomous reduction in the average propensity to consume.

To limit the argument to those cases in which the Keynesian investment multiplier is purported to be greater than unity, the remainder of this paper will assume scenarios in which the authoritarian increase in investment expenditure is funded entirely by printing money.

3.5.1   Procedural errors in the construction of Keynesian cross diagrams.

3.5.1.1   False shifts of the expenditure schedule

Figure 1A shows a standard elementary textbook treatment of Keynesian investment multiplier theory adapted from Chapman (1997) and Waud *et al.* (1996). The diagram plots expenditure on the ordinate *versus* income on the abscissa. Macroeconomic equilibrium in this diagram can be at any point on the 45-degree line where aggregate expenditure, *E*, is equal to aggregate income, *Y*. The diagram contains two parallel expenditure schedules: the first of these, $E_0 = C_0(Y) + I_0$, pertains to an initial equilibrium at which $E_0 = Y_0 = \$80$ billion
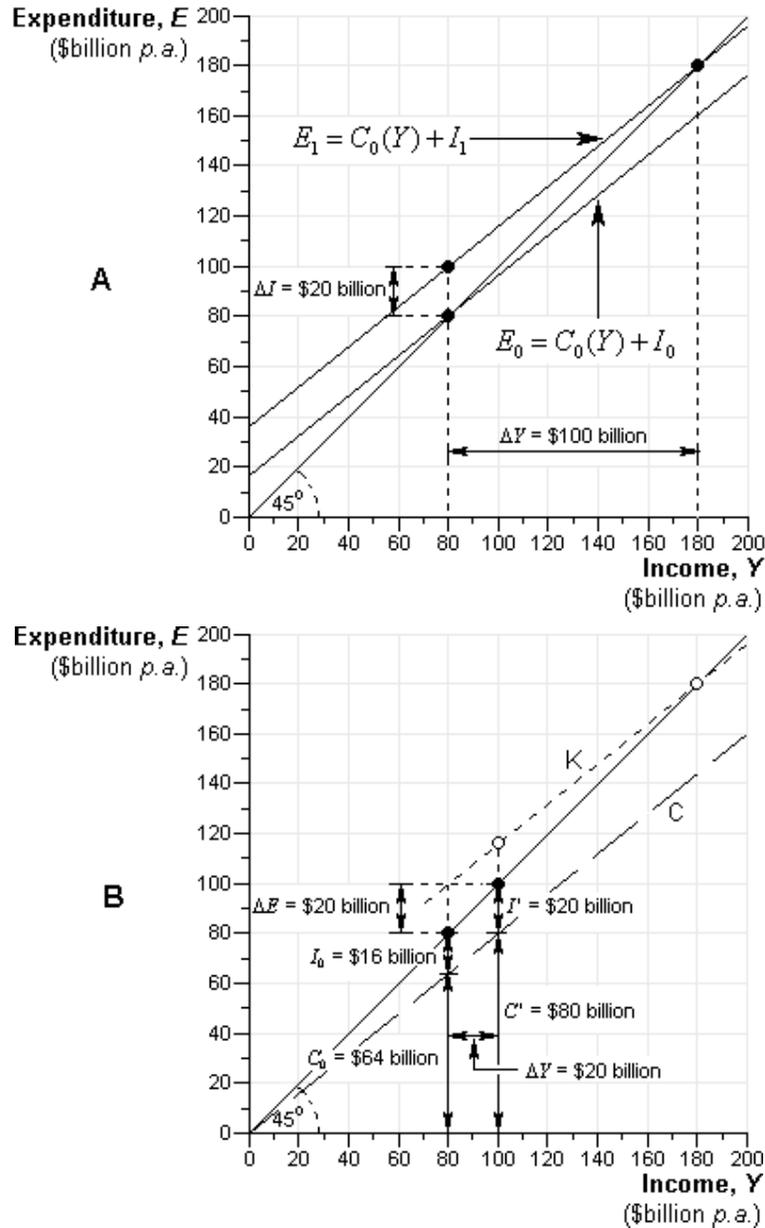

Figure 1. A: Keynesian cross diagram for a $20 billion authoritarian increase in investment [adapted from Chapman (1997) and Waud *et al.* (1996)];
B: Alternative diagram for a $20 billion authoritarian increase in income.

per annum; a second expenditure schedule $E_1 = C_0(Y) + I_1$ allegedly pertains to a new equilibrium, driven by a forced increase in aggregate investment of $20 billion *per annum*, at which $E_1 = \$180$ billion *per annum*. The same consumption function of income $C_0(Y)$ is assumed to obtain at both equilibria and, diagrammatically at least, is assumed to obtain across the entire income domain; thus, the consumption function has a constant slope—at all levels of income and in the face of all supposed investment 'shocks'—given by the marginal propensity to consume (*MPC*). In this example, *MPC* = 0.8 and the multiplier *k* is equal to 5 by the relation

$$MPC = 1 - 1/k.$$

Thus, these two expenditure schedules in Figure 1A (E_0 and E_1) are purported to demonstrate that, for the given *MPC*, an authoritarian increase in investment expenditure of $20 billion *per annum* will increase income (employment) by $100 billion *per annum*. That is to say, the authoritarian expenditure increase is multiplied five-fold in its effect on aggregate income.

It will now be shown that the *shift* in the expenditure schedule from E_0 to E_1 is falsely drawn by a flawed process that involves double counting of expenditure. The shift is always drawn as an *upward* movement of the expenditure schedule so as to determine a new equilibrium intercept that generates graphically the numerical result *assumed* by the flawed algebraic logic exposed in the preceding section. However, this Keynesian authoritarian 'investment' scenario also involves an increase in aggregate income that shifts the economy *rightward* on such diagrams. Once this rightward shift is admitted, it becomes easier to understand the double-counting involved in the standard Keynesian approach.

Figure 1B differs from Figure 1A by showing a different aggregate income and expenditure diagram representing an alternative view of the response to the same $20 billion *per annum* authoritarian 'shock'. We assume a simple economic model as follows:

- There is only consumption, *C*, and investment, *I*, with investment equal to saving [saving, properly defined, *never* includes the hoarding of cash (Ahiakpor, 1995) which is assumed anyway to be small and constant].

- The economy's income is distributed between consumption and investment according to a psychologically determined *average propensity to consume* (*APC*) equal to 0.8 (and thus the same as the *MPC* of Figure 1A).[6]

- Prior to time zero, the economy has been at a stagnant equilibrium with widespread unemployment, and zero rate of capital growth;[7] the economy's output at this initial equilibrium is given in terms of expenditure (*E*) and income (*Y*) as

$$E_0 = Y_0 = \$80 \text{ billion p.a..}$$

- At time zero the government initiates an employment stimulus ('shock'), funded by the printing of money; this new employment is assumed to be recruited entirely from the ranks of the previously unemployed. It is further assumed that the *APC* of the new employment is identical to that of the continuing employment. The size of the employment stimulus (new employment) is $20 billion p.a..

Figure 1B contains the standard 45-degree line and another line (labelled C) representing the average propensity to consume (*APC*). This *APC* line divides the pre-shock and post-shock expenditure into consumption, *C*, and investment, *I*. Given the assumption that the employment 'shock' is funded by the printing of money, there is no financial crowding out.[8]

Consequently, aggregate income, Y, increases by \$20 billion p.a. to $Y' = \$100$ billion p.a., and expenditure, E, increases by \$20 billion p.a. to $E' = \$100$ billion p.a.. Hence there is a simple, instantaneous movement along the 45-degree line upon the onset of the employment 'shock'.

This description is thus a static analysis of two snapshots, the first taken just before time zero, the other taken at time zero. The diagram says nothing about what will happen beyond time zero; this would require more information about what it is that the new employment is actually being employed to do. All we can know, from the scenario's assumptions, is that aggregate income has increased (owing to the printing of money) and the money is being spent at an equivalent rate such that there is an identical increase in aggregate expenditure.[9] Hence, the zero-time effect of the employment 'shock' is to move the economy along the 45-degree line.

The arithmetic underlying this analysis is now given, using the symbol ΔY to designate the employment 'shock' of \$20 billion p.a..

The new level of 'investment', I', is given by

$$I' = I_0 + (1 - APC) \cdot \Delta Y = \$16 + (1 - 0.8) \cdot \$20 = \$20 \text{ billion p.a..}$$

Similarly, the new level of consumption, C', is given by

$$C' = C_0 + APC \cdot \Delta Y = \$64 + 0.8 \cdot \$20 = \$80 \text{ billion p.a..}$$

Thus,

$$\begin{aligned}
E' = E_0 + \Delta Y &= \$80 + \$20 = \$100 = I' + C' = \$20 + \$80 \\
&= I_0 + (1 - APC) \cdot \Delta Y + C_0 + APC \cdot \Delta Y \\
&= I_0 + C_0 + \Delta Y \\
&= \$16 + \$64 + \$20 = \$100 \text{ billion p.a.} \\
&= Y' = Y_0 + \Delta Y = \$80 + \$20 = \$100 \text{ billion p.a..}
\end{aligned}$$

Keynesian static analysis

Keynesians usually call the above-named employment 'shock' an *investment* 'shock'. This is because Keynesians believe not only that there is a sufficiently clear and useful distinction between consumption and investment, but also that investment has a *primary* role in determining the final employment (Keynes, 1936, p.113). Therefore, the symbol ΔI is a convenient way of designating, for Keynesian analysis, what we have described above as an employment 'shock' using the symbol ΔY.

Keynesians also use a special arithmetic[10] to reach a conclusion totally different from the simple movement along the 45-degree line shown in Figure 1B. They claim that an investment shock determines an instantaneous excess demand (expenditure) over income (supply) as will now follow.

Before time zero

$$E_0 = Y_0 = I_0 + C_0 = \$16 + \$64 = \$80 \text{ billion p.a.}$$

At time zero

$$Y' = Y_0 + \Delta I = \$80 + \$20 = \$100 \text{ billion p.a.}$$

   but

$$E' = I_0 + \Delta I + APC \cdot Y'$$
$$= \$16 + \$20 + 0.8 \cdot \$100 = \$116 \text{ billion p.a.}$$

According to this arithmetic, expenditure (demand) now exceeds income (supply) and so the economy has moved *above* the 45-degree line by shifting $20 billion p.a. to the right and $36 billion p.a. upward to reach the point ($100 billion p.a., $116 billion p.a.) shown as the lower left open circle in Figure 1B. This is then claimed to move further, by the Keynesian multiplier process, to a new equilibrium at the point ($180 billion p.a., $180 billion p.a.) shown as the upper right open circle in Figure 1B. The dashed line, K, in Figure 1B is parallel to the *APC* line (labelled C), and is identical to the E_1 schedule in Figure 1A.

It is immediately apparent to the non-Keynesian reader, that this Keynesian analysis involves double counting in determining the new aggregate expenditure. The claimed equality

$$E' = I_0 + \Delta I + APC \cdot Y'$$

double-counts the $16 billion p.a. increase in consumption deriving from the new income ($\Delta Y = \Delta I$). It does this by first counting the entirety of $\Delta Y = \Delta I$ (second term in the right-hand side of the above equality) and then adds to it the consumption deriving from the new employment ($APC \cdot \Delta Y$), which, on addition of the pre-existing consumption deriving from the original employment ($APC \cdot Y_0$), yields the third term in the right-hand side of the above equality ($APC \cdot Y'$).[11]

It is always hazardous to attempt to second-guess why people think the way they do, but a clue to the rationale for the above double counting may lie in the term "investment 'shock'" to describe what we should prefer to call an "employment 'shock'". With this focus on 'investment', the Keynesians are effectively insisting that the *new level of investment* is not what we have called

$$I' = I_0 + (1 - APC) \cdot \Delta Y = \$16 + 0.2 \cdot \$20 = \$20 \text{ billion p.a.}$$

but what they obtain by adding the original investment to the entire "investment 'shock'", thus

$$I' = I_0 + \Delta I = \$16 + \$20 = \$36 \text{ billion p.a.}.$$

Given that that is what Keynesians do, how are they able to claim that they're not double counting? As will now be shown, the answer to this double-counting paradox lies in the confusion of supply and demand, and, to a certain extent, the confusion of a claimed investment stimulus with any kind of stimulus.

What happens when the government prints money to fund an employment stimulus?

Suppose the government decides that the interests of the economy will be best served by stimulating the production of a certain good *X*. The government then sets about doing this by printing money to pay all those previously unemployed people who could conceivably labour to produce *X*. This labour is not only that directly involved in the production of *X*, but also that involved in the manufacture and supply of all the inputs necessary for the production of *X*.

To keep the argument simple, we shall assume a primitive wages delivery system in which the government transports the newly printed money direct from the mint to the workplaces, to be delivered to the individual workers as cash in individual pay packets. It should thus be clear that the money will not have entered the economy *as a demand stimulus* even though the workers have taken it out of their pay packets and placed it in their pockets. Only when this

new money is spent or banked by the workers does it enter the economy as an increased demand.

This exposes an unfortunate error in Keynesian thinking. Such an employment 'shock' or stimulus is not a *demand* stimulus; it is a *supply* stimulus, paid for by enticing workers back into employment with an *income stimulus*, in return for which the workers supply *X* to the economy. This interpretation is valid whatever the nature of *X*, whether it is a capital good, a consumption good, or no good at all, i.e., whether *X* is the production of factories, follies or fantasy – see Figure 2.

The good *X* is a product for which there was no prior demand. The government's stimulus was not to create an authoritarian *demand* for *X* but an authoritarian *supply* of *X*. The stimulus to demand only comes when the recipients of the new money (the workers who have produced *X*) start to spend or bank it. To the extent that they don't simply hoard the new money, they create new demand for consumption goods and, via their savings, for investment goods, and this new demand, ΔE is potentially equal to (but not initially greater than) the new income in their hands, ΔY.

Thus, the Keynesian double counting derives from the basic error in regarding the employment stimulus as a *demand* stimulus instead of its proper status as a *supply* stimulus. Hence, the *primary* instantaneous effect of the stimulus is to shift income to the right by ΔY while the *secondary* instantaneous effect, dependent on the workers' not hoarding their earnings, is to shift expenditure upward by $\Delta E \leq \Delta Y$. If $\Delta E = \Delta Y$ then the economy has simply moved along the 45-degree line.

What happens next?

Under the newly imposed authoritarian employment stimulus regime at time zero, the economy will not be at equilibrium. Not only will the money supply be increasing at the steady rate of ΔY,[12] but there will be an excess demand for consumption goods (initially met by running down inventories) tending to raise their prices. The predicted effect on the price of capital goods is indeterminate, depending upon the nature of good *X* being furnished as a result of the government's *supply* stimulus. It is possible that there might be an oversupply of capital goods, resulting in a net lowering of the price of capital goods. The most likely outcome will be that price rises for consumption goods will outweigh any fall in prices of capital goods and so the overall price level will increase. This, in the absence of nominal wage increases will cause real wages to fall, a condition conducive to further reduction in unemployment. This is all consistent with classical economic theory and requires no Keynesian explanation.

Thus, all Keynesian cross diagrams representing investment 'shock' scenarios funded by the printing of money carry with them the 'double counting' error described above, i.e., they mistake a supply shock for a demand shock. This is the fundamental error reproduced in Figure 1A, and in textbooks, monographs and research papers the world over wherever Keynesian cross diagrams are drawn. This error is also a nice demonstration of Ahiakpor's (2001) contention that Keynesian analysis fails to recognise the primacy, or at least concurrence, of production (supply/income) relative to consumption (demand). Indeed, if the authoritarian supply 'shock' were imposed by using slave or convict labour with no monetary consideration, then there would be no demand stimulus to the economy whatsoever.

Equivalent Keynesian Public Works

Figure 2. "*Equivalent Keynesian Public Works*" Copyright © 2004-2009 Brian Chapman.
Original (upper) reproduced with kind permission of David Messent Photography (david@messentpress.com.au)
Adaptation (lower) supplied by the former DOJO Design (now **révéler**: create@reveler.com.au)

3.5.1.2 Failure to understand the meaning of equilibrium and the time taken to reach it

It was noted in discussion of Figure 1B that the position of $E' = Y'$ on the 45-degree line does not define a new equilibrium. That is to say, the equality $E = Y$ is *necessary*, but not *sufficient*, to determine macroeconomic equilibrium. Suppose that the authoritarian supply 'shock' actually involved the production of a useful capital good *X*. We should then have a situation where the aggregate capital stock would be increasing through the forced supply ΔY. Assuming the supply 'shock'[13] continued, then equilibrium would not be reached until the new capital stock had increased by an amount such that the annual injection of ΔY became just sufficient to maintain the new capital stock in the face of depreciation and user cost. An estimate of how long this would take may be obtained from the differential equation relating the rate of formation of the new capital stock K_1 to ΔY:

$$\frac{dK_1}{dt} = \Delta Y - \delta \cdot K_1,$$

where δ is the average annual rate of depreciation (including user cost) of K_1. The equilibrium value of K_1 will thus be given by equating the rate of change of K_1 to zero, yielding:

$$K_1^{\infty} = \frac{\Delta Y}{\delta}$$

The time course of generation of this *new* capital stock, K_1, is given by

$$K_1 = K_1^{\infty}(1 - e^{-t \cdot \delta})$$

where *t* is time expressed in years; it describes an exponentially asymptotic approach to 'equilibrium'.[14]

Thus, if δ were given a reasonable value of, say, 20% *per annum*, it would take approximately 15 years for the accumulation of *new* capital stock to grow to within 95% of its final 'equilibrium' value of $5 \cdot \Delta Y$. Even if δ were given a highly generous value of 30%, the 95% waiting period would still be 10 years. As Keynesian multiplier theory is purported to be a short-run (even potentially instantaneous) phenomenon brought about by short-run interventions, it is ironic that no steady-state response to a Keynesian investment shock could be conceivably attainable within the lifetime of a democratically elected government. The Keynesian multiplier's presentation as a policy instrument for the use of government is both misleading and inappropriate.[15]
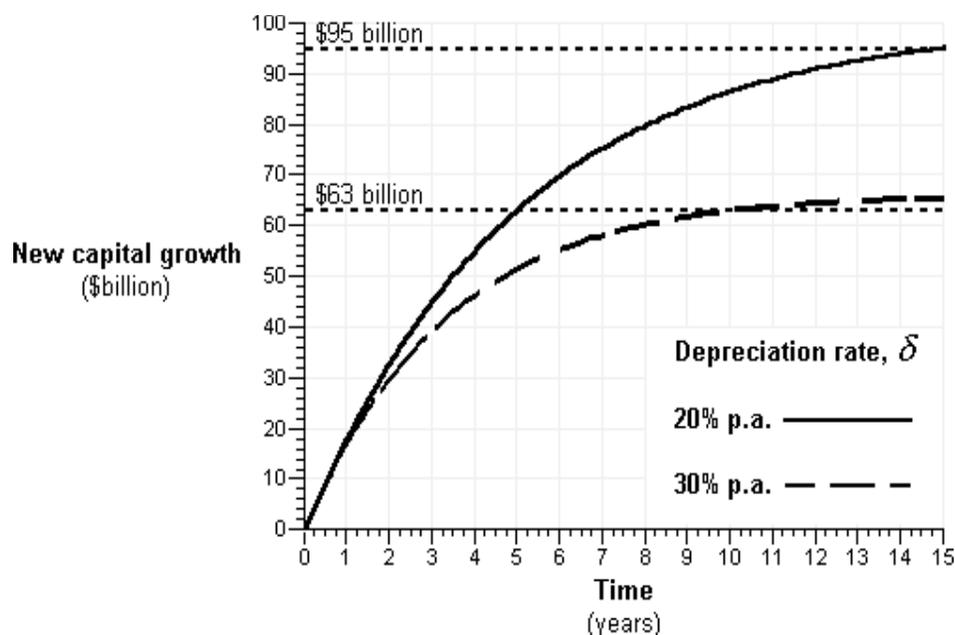
Figure 3. Time-course of exponential approach to a steady-state level of new capital stock issuing from a continuously maintained investment 'shock' of $20 billion p.a. in the face of two different rates of depreciation.

3.5.1.3 Saving is not a 'leak' and the expenditure function is the 45-degree line

Our analysis would be incomplete without including the objections emphasised by Ahiakpor (2001, p.757) who notes that the multiplier "is founded on the notion that saving takes away from the expenditure stream." He goes on to remind the reader that this notion—together with the relayed summation processes involved in the working of the multiplier through successive expenditure rounds—is valid "only if saving is the hoarding of cash, which it is not" (see also Ahiakpor, 1995 on Keynes's false 'Paradox of Thrift'). Applied to the above discussion of Keynesian cross diagrams, Ahiakpor's arguments, together with similar claims by Hazlitt (1959, chapter VIII), indicate that *the expenditure function cannot be anything other than the 45-degree line*, except insofar as there might be non-zero rates of change in the stock of hoarded cash.

This view is reinforced by Ahiakpor's (2001) important observations that Keynesianism ignores the concurrency of production and consumption and relies unduly on an arbitrary distinction between investment goods and consumption goods. Regarding the first point, he states on p.761 that

> the Keynesian multiplier argument is founded on a misconception of the role of consumption rather than production in the income determination process

Regarding the second point, Ahiakpor (2001) states,

> If it is legitimate to divide an economy's output into consumption and non-consumption goods, it is nevertheless important to keep in mind that it is the totality of incomes earned from production in both sectors that is used to purchase both goods (p.767).

All of this rather takes care of the elusive nature of the marginal propensity to consume; it turns out to be an imaginary concept of no macroeconomic significance whatsoever.

4 Effects over Time

Although we reject multiplier theory for reasons already given and as also given by Ahiakpor (2001) and Hazlitt (1959), it is important to take note of the full measure of the theory's own internal inconsistency as yet further evidence of failure of intellectual rigour in Keynesian thinking.

4.1   Is the Short Run Long Enough?

Keynesians would agree that the multiplier effect is essentially a short-run phenomenon and that all diagrams, however complex, derived from the basic model illustrated in Figure 1 assume a time period short enough for wages, prices, taxes and interest rates to remain stable, along with stable marginal propensities to consume and to import.

Given the belief[16] that the multiplier is alleged to take time to work in a real economy through serial rounds of consumption, the question arises as to what is the duration of such a 'round'? A simplistic answer to that question is that it might be supposed to equal the reciprocal of the velocity of money which, in Australia, has changed slowly over the past half-century and generally hovered around a value of 1.9 ± 0.6 per annum[17] [quoted by Waud et al. (1996)]. This would determine a duration of 4.5 to 9 months for each expenditure round, requiring at least one to two years for the multiplier effect to become significantly manifest.

4.2   Is the Velocity of Money Volatile Enough?

A further consideration relating to the velocity of money is whether or not velocity is volatile enough to sustain a 'shock' increase in aggregate income without violating the short-run assumption of a constant price level. Given (a) that the difficulties of measuring velocity are well known and (b) that the percentage increase in aggregate income envisaged from a 'shock' of realistically small size in a real economy (as distinct from the mega-shocks that inhabit Keynesian cross diagrams) will be quite small, this problem is one of theoretical interest in principle rather than one of practical significance.

Nonetheless, these two points concerning the velocity of money should have been considered in the Keynesian literature and the textbooks for the sake of intellectual completeness. Earlier considerations of the relation between the income velocity of money and the multiplier have not pressed home as precisely the need for quantitative internal consistency (Haberler, 1960, pp.231-232, 313-4; Robertson, 1936, pp.171-175).

5 Why Keynesian Economics?

5.1   "We are all Keynesians now"

Milton Friedman's words "… we are all Keynesians now …" (famously echoed out of context by former US President Richard Nixon) "… We all use the Keynesian language and apparatus …" (Friedman, 1968, p.15) certainly remain accurate in relation to macroeconomics as a discipline. Monetarists use the same rectilinear diagrams as the Keynesians—only the slopes of the lines are different, owing to different normative assumptions. Thus monetarists are only *pseudo*-anti-Keynesian so long as their theories are founded on the same intellectual quicksand as the orthodox Keynesian/Hicksian legacy of *The General Theory*. In other words, all contemporary macroeconomics must be regarded as 'Keynesian' for as long as its pedagogical and investigative tools are founded upon, derivative of, or consistent with Keynesian cross diagrams, multipliers (whether full or attenuated) and IS-LM analysis.

While the present paper, taken with the earlier literature cited by Ahiakpor (2001), proves the invalidity of Keynesian multiplier theory beyond any reasonable doubt, it begs the question as to why Keynesian economics has survived so long and why it has remained largely undeflected in its course as earlier criticisms have apparently been ignored.

5.2   A Seductively 'Generous and Gay' Macroeconomics

The historical pageant of financial collapses in Australia alone, let alone in the world at large, provides enduring testimony to the fact that economic man has an irresistible propensity to relax prudential standards at the slightest opportunity, and never seems to learn from the tear-drenched lessons that all such adventures recapitulate. Keynes's (1936) Bloomsbury rhetoric pandered directly to this weakness, and showed a cavalier freedom with the concept of investment, as evident in the following excerpts from Chapter 10 of *The General Theory*:

> Thus public works even of doubtful utility may pay for themselves over and over again at a time of severe unemployment … (p.127).

> Pyramid-building, earthquakes, even wars may serve to increase wealth … (p.129).

> Ancient Egypt was doubly fortunate, and doubtless owed to this its fabled wealth, in that it possessed *two* activities, namely, pyramid-building as well as the search for precious metals, the fruits of which, since they could not serve the needs of man by being consumed, did not stale with abundance. The Middle Ages built cathedrals and sang dirges. Two pyramids, two masses for the dead, are twice as good as one; but not so two railways from London to York. Thus we are so sensible, have schooled ourselves to so close a semblance of prudent financiers, taking careful thought before we add to the 'financial' burdens of posterity by building them houses to live in, that we have no such easy escape from the sufferings of unemployment. We have to accept them as an inevitable result of applying to the conduct of the State the maxims which are best calculated to 'enrich' an individual by enabling him to pile up claims to enjoyment which he does not intend to exercise at any definite time (p.131).

Keynes did not pause to develop a formal logic to distinguish between multiplier effects deriving from the construction of new factories and those deriving from useless public works. If the newly created capital good is an Egyptian pyramid, a Blue Ridge Parkway or a Mass for the Dead, the increase in production of consumer goods is unlikely to be significant and, according to Keynesian multiplier theory based falsely on the primacy of consumption (see Ahiakpor, 2001), the supposed multiplier effect might be smaller. However, according to the flawed logic underpinning the construction of Keynesian cross diagrams, it should make no difference at all—and this is how it is usually interpreted and taught.

The problem with Keynes's polemical examples is that they tend to lend themselves to anti-prudential interpretations and attitudes. As one of Keynes's contemporaries put it,

> Keynes's reformed capitalism had everything and more the Fabian generation had looked for in socialism: it was morally speaking egalitarian, it was fully employed, it was generous and gay … (David Bensusan-Butt, Kings College Cambridge scholar, 1933, quoted by Skidelsky, 1996, p.2).

It doesn't matter whether or not Keynes was only joking or being hyperbolic in his discussion of pyramids, dirges, duplicate railway lines from London to York, etc.. Hazlitt (1959, p.152) has noted, regarding the problem of dealing seriously with Keynesian polemic,

> In Section VI of Chapter 10 on the multiplier [*sic.* Chapter 10: The Marginal Propensity to Consume and the Multiplier], Keynes lets himself go in one of the irresponsible little essays in satire and sarcasm that run through the *General Theory* as they run through all his work. As these essays rest on obviously false assumptions, and as Keynes writes them with his tongue more or less in his cheek, it might seem to be as lacking in humor to "refute" them seriously as to "refute" a paradox of G. K. Chesterton or a[n] epigram of Oscar Wilde. But these little essays are the most readable and the most easily understood part of Keynes's work. They are quoted by many laymen with chuckles of approval and delight. So we had better give them a certain amount of serious attention.

The point is that Keynesian theory gives nothing but encouragement to someone who takes Keynes's polemics seriously. Certainly, go right ahead and build two railways to York, and if after a while you find you don't need the second one, then recruit a fresh army of unemployed to rip it up again. No harm done! In fact, set it up as a cyclic building/demolition exercise in perpetuity and then there will never be any more unemployment in England. As Keynes noted on p.383 of *The General Theory*,

> Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back.

If Keynes had lived as long as his father[18] he'd have seen many of his chickens coming home to roost.

5.3   Failure of Intellectual Rigour

The seductive power of Keynesianism is unlikely to rest simply upon the fact that it was seen to be 'generous and gay' in its prescriptions. This would hardly be sufficient to seduce academic economists into all-pervasive error.

For example, in Figure 1, (a) the rectilinearity of the expenditure schedules over the income domain, (b) the non-zero intercepts of the expenditure schedules on the spending-axis, and (c) the constancy of the slope of the expenditure schedule in the face of a major investment shock are all as fictitious as the Emperor's new clothes. Propagation of these Keynesian ideas—along with their Hicksian progeny[19]—requires suspension of intellectual rigour and critical inquiry in teachers and learners alike; sixty years of such undisciplined propagation has left the study of macroeconomics destitute.

Unfortunately, the monetarist counter-revolution failed to reclaim any of the intellectual rigour sacrificed in the Keynesian revolution. We have already noted the Keynesians' neglect of the requirement to achieve an internally consistent definition of the short run to justify the theory and practical working-out of the Keynesian multiplier. But at least this neglect is a sin of omission; the monetarists, on the other hand, appear to be guilty of sins of commission. For example, the beginning student of economics is usually taught the distinction between the short run and the long run by reference to the different time frames required for a hairdresser to meet excess demand by extending trading hours with existing capital equipment *versus* installing extra chairs or expanding into larger premises. What, then, are we to make of Blaug's weary paraphrase of Milton Friedman's discussion of the short run?

> So, money is certainly non-neutral in the short run and the 'short run' is typically two years but may actually be as long as 3-10 years; long-run neutrality will only be observed after a decade and

will only amount in any case to near-proportionality between money and prices (Blaug, 1995, p.45).

It is remarkable that such thoughts receive serious consideration in the present age of rapid technological change and financial innovation; they certainly indicate significant suspension of intellectual rigour. Thus, the monetarists have not denied the Emperor his new suit; rather, they have adjusted the hem lengths and added flares. Whatever else the above paraphrase might tell us in our quest for a definition of the Keynesian short run, we may safely conclude that monetarists, for their part, have advanced their *pseudo*-anti-Keynesian position significantly beyond the certitudes of the barber shop.

5.4   Politics and the Quest for a Belief System

That Keynesian multiplier theory and the associated Keynesian diagrams have been so widely and uncritically accepted for so long suggests to this author that Keynes was an example of the right man with the right ideas for the people of his time. Mention has already been made of Ahiakpor's (2001, p.746) statement that the writings of those economists who have questioned Keynesian orthodoxy have met "with hardly any success in limiting its widespread acceptance and teaching in macroeconomics."

The widespread, naive acceptance of belief systems associated with great men of ideas, who captured the imaginations of their contemporaries, has been well explored by Jacques Barzun (1958) in his *Darwin, Marx, Wagner: Critique of a Heritage*. Circumstances in the 1930s were ripe for this kind of intellectual phenomenon to be replayed in the sphere of political economy. In the wake of the Great Depression, Keynesian economics seemed to offer democratic governments a third alternative to the competing contemporaneous movements of fascism and communism. However, there is an unexposed irony about this compromise 'third way': in the 20th-century, liberal socialists may have occasionally winced at the description of their socialism as "communism without tanks"; Keynesian interventionists would have had even more occasion to wince had there developed a fashion for bestowing on their creed the equally accurate epithet of "fascism without tanks". In his biography of the British fascist leader Oswald Mosley, Skidelsky (1975, p.302) notes that

> Mosley was a disciple of Keynes in the 1920s; and Keynesianism was his great contribution to fascism. It was Keynesianism which in the last resort made Mosley's fascism distinctively English.

Moreover, in the second volume of his biography of Keynes, Skidelsky (1992, p.702) records that Mosley was

> the first (and only prominent) political advocate of Keynes's monetary and fiscal policies in the period 1924-1931. [Keynes] was in sympathetic contact with him up to 1931.

Finally, in the third volume of the same biography, Skidelsky (2000, p.28) states that Keynes

> loathed the Nazi regime, never visited Germany after 1933, and never drew attention to the successes of Hitler's economic policies—a commendable feat of self-denial in the circumstances.

The political implications and possibilities deriving from Keynesianism seem, from the outset, to have exposed macroeconomics to the kind of intellectual hazard that was well understood by Irving Fisher (1911), who wrote (p.viii):

> As some one has said, it would seem that even the theorems of Euclid would be challenged and doubted if they should be appealed to by one political party as against another.

To this statement it can be added that such corruption of Euclidean theorems could only develop to the extent that intellectual rigour were sacrificed. Without such sacrifice, the theorems would continue to command appropriate acceptance; *but, given the sacrifice, there would be no obvious limit to the false prophecy and pedagogical folly that might ensue.* In

what amounts almost to a clinical case summary regarding the see-sawing fortunes of the quantity theory of money, Skidelsky (1983, p.xviii) has noted that the youthful "Keynes claimed that adherence to it was a test of scientific competence; that any denial of it was a sign of a 'natural deformation of the mind'. A few years later he cheerfully jettisoned it; in the 1970s back it popped." Writing of this, among other economic ideas, Skidelsky continued:

> If economics were really like physics, it would be impossible for ideas fundamental to the subject to disappear one moment and reappear the next—like the Cheshire cat in Alice in Wonderland. Clearly the rise and fall of ideas in economics is as much connected with attendant circumstances, including ideological and political circumstances, as with their logical properties or their power of passing any test of prediction. And by this I mean not only the use of such ideas by politicians or policy-makers but their hold on the minds of economists themselves (Skidelsky, 1983, p.xviii).

Thus, the mathematical and logical flaws in Keynesian multiplier theory exposed in this paper and that of Ahiakpor (2001), together with such detailed intellectual criticism as that of Hazlitt (1959), have passed essentially unnoticed among the consensus of successive generations of macroeconomists for over 70 years. The hold of Keynesian ideas on the minds of economists has survived, despite all the flaws, almost certainly because of considerations arising from political power and the need for a belief system. For, in the end, this is the ultimate purpose of ideas like the Keynesian multiplier—to provide a basis not only for belief but for the growth and entrenchment of political power. Thus, the Pharaoh can have his soothsayers, the soothsayers can have their Pharaoh—and they can *all* have their pyramids!

More than a suggestive confirmation of this conclusion and an appropriate last word for this section may be found by turning once again to the writing of Keynes's esteemed biographer:

> Robertson and Pigou were fighting a rearguard action to show not that the classical scheme of thought denied the possibility of 'involuntary unemployment', but that such unemployment could not be part of an equilibrium state. The decline in the economy set in motion forces of recovery, irrespective of the policy of the monetary authority. However, though the existence of these forces was later admitted, and Keynes's assault on the classical theory judged to be logically flawed, orthodox theory was not thereby rehabilitated. Keynes's critics were forced to concede that recovery forces came in to play uncertainly and feebly after a long period of subnormal activity; *and they were thus of little interest to economists or governments who <u>believed</u> that Keynes had given them the <u>tools</u> to prevent large-scale fluctuations in demand from occurring in the first place, or reversing them quickly when they did occur* (Skidelsky, 1996, p.87, the present author's italics and underlining).

6   Conclusion—The 'Euthanasia' of the Keynesian

6.1   Did Keynes Recant?

It would be less than charitable to conclude this paper without giving Keynes credit for the possibility that he was moving toward a recantation from Keynesianism at the end of his life. Hazlitt (1959, chapter XXV) discusses this possibility sympathetically and notes, among other things, Keynes's (1946, p.186) reference to

> … modernist stuff, gone wrong and turned sour and silly …

In view of the present analysis, it is appropriate to echo Hazlitt's (1959, p.397) rhetorical question concerning this quote:

> What could this refer to except Keynesian theory itself, as interpreted and applied by his more zealous disciples?

While we cannot know the answer to that question we do know that mainstream macroeconomic pedagogy contains no such recantation. A few years ago, some macroeconomists might have claimed that Keynesian multiplier theory was rather dull and uninteresting – that macroeconomic pedagogy had 'moved on', so to speak. Even if the widespread Keynesian responses to the current global financial crisis had not nullified such a claim, this is a very different matter from the kind of analytical refutation essayed in the present paper.

6.2   How is Keynesian Multiplier Theory represented in Modern Pedagogy?

Most economics textbooks continue to include Keynesian multiplier theory as a major foundation of macroeconomic thinking with not a hint that the theory might be seriously flawed. The texts by Samuelson and Nordhaus (2001, pp.491-450) and by McTaggart *et al.* (2007, pp.568-585) contain richly elaborated accounts of the theory and are liberally illustrated with many Keynesian cross diagrams. Even the texts authored by Mankiw (2004, pp.765-780) and by Krugman *et al.* (2007, pp.409-413), while containing no Keynesian cross diagrams as such, still present the multiplier theory at face value, complete with the algebraic derivation of the multiplier based on an infinite series of expenditure rounds. This derivation is given explicitly in three of these examples of current textbooks (Samuelson and Nordhaus, 2001, pp.496-497; Mankiw, 2004, pp.766-767; Krugman *et al.*, 2007, pp.410-411) and is implicit in the cumulative diagram used by McTaggart *et al.* (2007, p.570, Fig.24.8), reflecting the respective authors' implicit acceptance of the erroneous notion that saving is a leak from the economy.

It is tempting to view the omission of Keynesian cross-diagrams from the textbooks by Mankiv (2004) and Krugman *et al.* (2007) as perhaps a first step towards a total rejection of multiplier theory as intellectual rigour is gradually applied to its re-appraisal. However, *Essentials of Economics* (Krugman *et al.*, 2007) contains, both in the text and in a highlighted marginal note on p.127, the unfortunate mistake:

> The **marginal propensity to consume,** or **MPC,** is the increase in consumer spending when disposable income rises by $1.

One would have hoped that the above *faux pas* might by the 21st-century have become a widely used incorrect distracter in multiple-choice questions on the definition of the MPC in Economics 101 examinations! The same mistake is repeated on p.128 of this text in regard to the marginal propensity to save.

At the time of publication of the third edition of Mankiw's *Principles of Economics* (2004), much was made of the fact that the author had relegated Keynesian multiplier theory to a few

pages in the twelfth chapter of the 14-chapter section on macroeconomics. The author's attitude to the theory's usefulness is well captured by his summarising statement on p.769:

> To sum up: *When the government increases its purchases by $20 billion, the aggregate demand for goods and services could rise by more or less than $20 billion, depending on whether the multiplier effect or the crowding-out effect is larger.*

But there is no suggestion here that the multiplier theory might be intrinsically unsound.

6.3 A Purge Long Overdue

The arguments developed in this paper drive us inescapably to the conclusion that the contemporary discipline of macroeconomics is indeed founded upon, and permeated with, much "stuff gone wrong and turned sour and silly." The widespread use of Keynesian cross diagrams[20] in introductory and intermediate textbooks reflects poorly upon the profession. These diagrams should be withdrawn as a matter of urgency from the diet of students and from the resources of academic teachers and researchers in macroeconomics. They have no place in future macroeconomic publications except as sad, historically indelible relics of professional error on a global scale among the world's macroeconomists.

We lay particular stress on the need to discard the cross diagrams because of the very real possibility that they may have directly prolonged the survival of the inadmissible multiplier theory. After all, it might be reasoned, the concept and the algebra can't be wrong if the diagram shows that they're correct! And now that the cross diagram has been shown to be inadmissible in itself, not just multiplier theory but the whole IS-LM analysis collapses.

Thus, there is no longer any justification for retaining Keynesian multiplier theory, cross diagrams or IS-LM analysis in the education and training of students. The need for such a purge is especially poignant in the context of the current global financial crisis, in response to which so many Western governments have resorted to massive Keynesian stimuli in the hope of improving economic conditions. The 'euthanasia'[21] of the Keynesian from our academies is the much-needed first step for macroeconomics to be purged of its pedagogical sickness. Whether or not macroeconomics as a discipline will survive such heroic surgery is a question beyond the scope of the present paper.

7 Acknowledgements

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[1] Here we are thinking of a miser who invests all his money rather than one who keeps his money under his bed.

[2] It would be less than honest for the author to suppress misgivings about this statement. It is possible that most economists might be quick to agree with it, but it relates to the question as to whether or not it is meaningful to equate Saving with Investment (as defined by Keynes and said by him to be merely two aspects of the same thing). There is a difficulty with this view, given that any new saving that any given individual sets aside may

be lent to a business agent who might use it to spend on maintenance, travel, or any other kind of consumption. It is mere wordplay to then reconcile the contradiction by defining the business agent's activity as *investment*.

[3] As is discussed elsewhere in this paper, the 'investment' deriving directly from a government stimulus may bear no commonly recognised relationship to the production of capital goods.

[4] One of the unfortunate defects of macroeconomic discourse is its frequent use of the word "autonomous" in an idiosyncratic sense that does not accord with its use in common parlance or in general scientific usage. We prefer the word "authoritarian" as used in the literature of the 1930s and 1940s. If Keynesian concepts such as the marginal propensity to consume have any validity at all as capturing the natural psychological behaviour of an economy comprising self-governing individuals, then it is these sorts of concepts that should attract the adjective "autonomous". The use of this word to describe an authoritarian 'shock' imposed on an economy's natural propensities would seem to be a case of outright malapropism.

[5] Keynesians frequently discuss such things as 'autonomous consumption' (which we should prefer to call 'authoritarian consumption') without giving specific examples of exactly who might be consuming what. We venture to suggest that, while the building of bridges as public works might exemplify authoritarian investment, perhaps the bombing of bridges as acts of war might exemplify authoritarian consumption. Keynesian multiplier theory and cross diagrams treat equal amounts of expenditure on these two contrasting activities as being economically identical in their determination of a new equilibrium.

[6] The Keynesian distinction between consumption and investment is neither unequivocal nor particularly useful. However, it is deeply ingrained in, and essential to, discussion of Keynesian multiplier theory; therefore, we shall allow the distinction some credibility here for the purposes of illustration. Hence, the concept of the *APC* is equally questionable, but temporarily admissible for the sake of argument.

[7] This means that the level of saving and investment is sufficient only to maintain the existing capital stock in the face of wear-and-tear and depreciation.

[8] It is also assumed that there is no psychological crowding out, i.e., *APC* remains the same.

[9] It is recognised that this new expenditure will result in the running down of inventories. For this and other obvious reasons, the time zero 'snapshot' cannot possibly be an equilibrium even though it lies on the 45-degree line.

[10] It should be noted that this arithmetic is implicit in the standard illustration of the Keynesian cross diagram. It is *not* explicitly spelt out in standard explanations accompanying those diagrams; had it been made explicit, the errors would have been long evident and the diagrams abandoned.

[11] At this point it might be asked by a non-Keynesian why Keynesians do not include the portion of ΔY *not* consumed, i.e., the portion $(1 - APC) \cdot \Delta Y$, in their new aggregate demand, thus making it equal to \$120 billion p.a.. This is because Keynesians believe that the saving associated with refraining from consumption is a 'leak' from the economy that detracts from aggregate demand. This means that, although they insist that saving is identical to investment at equilibrium, paradoxically they believe that saving and investment are totally dissociated from each other following a shock.

[12] It may be objected that it is not necessary to print new money (so-called 'high-powered' money) at the rate ΔY in order to increase the money supply by ΔY through the banking system; that is acknowledged without altering the sense or validity of the present analysis.

[13] The word 'shock' is unfortunate. It suggests a one-off 'impact' intervention, rather than a continuing intervention sustained for as long as is necessary to procure *and maintain* the desired equilibrium. Both Keynesian and non-Keynesian analyses predict that any new 'equilibrium' or steady state induced by such an intervention will collapse when the intervention is discontinued.

[14] In the scientific literature, this so-called 'equilibrium' would be referred to as a non-equilibrium steady state. This is because such a steady state as posited here requires a continuous input of financial 'energy' to maintain it; i.e., it is not a true equilibrium such as would be approached in the absence of this financial 'input' or 'investment shock'. The description given here and in Figure 3 is in accord with the well-known kinetics of first-order rate processes in physical systems. Nonetheless, we shall continue to use the word 'equilibrium' in the loose sense used by macroeconomists for the remainder of this paper.

[15] It is no defence against this judgment for Keynesians to claim an idiosyncratic meaning for their use of the word 'equilibrium' given by $E = Y$ on the 45-degree line of Figure 1. We have already shown that this equality, while *necessary*, is *insufficient* for either true equilibrium or a non-equilibrium steady state.

[16] This belief is manifest in the widely used mathematical summation of an infinite series of expenditure rounds to realise the full Keynesian multiplier effect. This summation involves the incorrect assumption that saving is a leak from the economy.

[17] This value applies to calculations based on final products, not transactions. We shall not concern ourselves here with any problems attaching to the definition of money used for the calculations. Nor shall we be distracted by allowing the macroeconomic concept of the velocity of money to be confused with issues such as the cyclical holding of cash balances and short-term bonds by wage earners (Tobin, 1956).

[18] John Neville Keynes, 1852-1949.

[19] *IS-LM* analysis.

[20] It is recognised that such diagrams are derivative creations by Keynesians rather than original creations by John Maynard Keynes.

[21] This usage is adapted from Keynes's (1936) unfulfilled apocalyptic vision of "the 'euthanasia' of the rentier."

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