

extent) prediction, they could provide at best a 'symptomatology' of the course of the cycle'. But they were of little help when 'what is at issue is . . . the cause of cyclical fluctuations in general'; then recourse would have to be had to the explanations offered by 'abstract' theories (McCloughry (ed.), 1984, p. 7).

What Keynes and Hayek had in common, therefore, was the insight of the fundamentally different character of a monetary economy. In the present context, the difference in the respective ways they embodied it in their analysis is of secondary importance. 'In the present context' must be emphasized: the limited purpose of the present essay is not meant to justify a neglect of the wider issues involved. It still remains incumbent upon us to arrive at a judgement of how successfully the two economists informed their analysis by their insight, and how adequate were the theories of fluctuations in economic activity which they developed.

10 Value and protection in the *General*

Theory

John Weeks

Introduction

Above all others, two theorists stand out, their influence if not the mechanics of their theories surviving the ravages of time: Karl Marx, the greatest intellectual influence on economics of his century, and John Maynard Keynes, the greatest of this century. The influence of the former upon the latter was probably slight,¹ but both shared a vision of the capitalist economy which sets them in common category. Both Marx and Keynes operated from the premise of intuition that capitalist economies are by their nature unstable and prone to fluctuations.² This vision or intuition is in sharp contrast to modern, neo-classical analysis that models the capitalist economy on the presumption of inherent stability, epitomized in general equilibrium analogs.³

A basic goal of Keynes in the *General Theory*, he tells us, was to provide an integration of the theory of money and the theory of value, a task which he felt previous economists had either attempted and failed or prided themselves in rejecting.⁴ Marx also sought to integrate the theory of value and the theory of money, though in the context of capital accumulation rather than short-run employment and output determination. This common vision of the theoretical task of political economy is in contrast to the marginalist-neoclassicals with their tendency to analyze conditions of optimal allocation with money 'neutral'.

The pursuance of the task of integrating value theory and money involves a fundamental conceptual difficulty: how does one specify the relationship between the monetary value generated by a capitalist economy, on the one hand, and the material production arising from the labour process, on the other? Since the onset of the marginalist revolution, mainstream economics had treated this issue as one of 'aggregation', with its difficulties subsumed under the rubric of 'index number' problems. This is, however, a trivialization of a profound conceptual building-block of economic theory. It is not too much to say that the manner in which the reconciliation

between money value and material production is made is the core of economic theory, determining basic method and subsequent analytical detail.

On this basic issue, Keynes stands out from the marginalists who preceded him and the neo-classicals to follow, even from the post-Keynesians of the Robinson-Kaldor School and most assuredly from the Clower-Leijonhufvud 'reappraisal' approach. Keynes' introduction of the concept of the 'labour unit' early in the *General Theory* is his analytical vehicle to relate money value to material production, and represents his most revolutionary break with the theory of his contemporaries, for it implies the abandonment of the marginalist theory of value. While the labour unit is a far cry from the concepts of value developed either by Ricardo or Marx, the logical consequences of its introduction displaces Keynes' method from the world of the marginalists—neo-classicals into the classical tradition.⁵

But as Brothwell shows elsewhere in this volume,⁶ Keynes chose not to break with the marginal productivity theory of production and distribution; on the contrary, he explicitly endorsed the concept of the marginal physical product of labour (the 'first classical postulate'). Thus, his use of the labour unit appears as an idiosyncratic moment of eclecticism, contradicted by what went before (acceptance of the 'first classical postulate') and what follows. Not surprisingly, the labour unit and its associated concepts such as 'user cost' disappeared from view almost at once, becoming at most a curiosity known only to students of the history of economic thought. Anyone dredging up these ideas after fifty years renders himself or herself equally curious.⁷

In what follows below, I argue that Keynes' introduction of the labour unit was profoundly important, and his own ambivalence about it disastrous for the subsequent development of macro-economics. It helped pave the way for the counter-revolution of the neo-classicals, in which the composite commodity aggregate production function devastates the theoretical insights of the *General Theory*. As a result of Keynes' endorsement of the 'first classical postulate', the integration of the theory of value and the theory of money becomes an unlikely prospect in the *General Theory*. The basis of the real monetary dichotomy remains unchallenged, only complicated in situations of disequilibrium. As a consequence, a second marginalist—neo-classical assumption that Keynes did not seriously challenge — the 'autonomous' money supply — provides the *coup de tête* for the project of theoretical integration of money and value.

The purpose of this paper is not to offer yet another interpretation

of the *General Theory*, but rather an essay on method, exploring the implications of Keynes' treatment of aggregates at certain points in his theory of employment. It shall be argued that Keynes' treatment of aggregates is in sharp contrast to neo-classical theory. But reviv- ing his discussion of aggregation cannot be the basis of a general interpretation of the *General Theory*, for Keynes himself did not pursue the more radical implications of his own analysis. In a sense the neo-classical synthesis school was quite right in discarding Keynes' novel approach to aggregates and constructing its macro-economic theory upon marginalist foundations. Analogies between social sciences and the physical sciences are suspect, but Keynes' role in economics can be compared to that of Copernicus in astronomy, who replaced a geocentric model with a heliocentric one, but did not challenge the Ptolemaic system of celestial mechanics. Like Copernicus, Keynes replaced the full-employment model with one having effective demand at its centre, but did not challenge marginal productivity theory. The debate over Keynes' contribution almost entirely involves his Copernican contribution — the role of effective demand with marginalist mechanics. This orientation is faithful to the general context of the argument in the *General Theory*. In what follows, our interest is in the *General Theory* as a shot fired (and it was perhaps little more than that) in a Newtonian revolution in economics, in which the entire basis of marginalist theory is challenged, as the general laws of gravitation challenged the Ptolemaic view of the harmony of spheres and perfect symmetry of the heavens.

My method of argument reverses the chronological development of economic theory. First considered is the macroeconomic model of the post-Keynesian synthesis. The purpose here is to demonstrate the internal inconsistencies arising from use of the marginal productivity theory of production and distribution. These problems are well known, though of little consequence in the actual practice of neo-classical modelling. The argument is that these inconsistencies derive from the particular manner in which the relation between money value and material production is treated. Here, I briefly consider the critique of the Clower-Leijonhufvud school and the 'capital controversy'. With these familiar controversies in mind, I then turn to Keynes, to argue that the labour unit provided the *General Theory* with the vehicle to avoid these inconsistencies. The concept of the labour unit itself has much in common with Ricardo's value theory, notwithstanding Keynes' critique of Ricardo for his attacks on Malthus' under-consumptionism.⁸ However, use of the labour unit in the analysis of a money-exchange (capitalist) economy requires that it be monetized (which Ricardo failed to do). The

particular way Keynes achieved this monetizing of the labour unit, converting it into the 'wage unit', resulted in a concept of extremely limited use. This, perhaps as much as Keynes's own ambivalence about abandoning marginal productivity theory, explains the still-birth of the labour unit as a concept of analysis. Finally, I present Marx's solution to the relation between money values and material production, and argue that it provides a way forward in macro-economic analysis.

The neo-classical synthesis

While on virtually every issue in economics, theoretical or empirical, there is disagreement and controversy, one finds general assent as to what constitutes the 'neo-classical' macroeconomic model. It is a model incorporating mathematical functions to explain personal and business expenditure, money demand and supply, and labour demand and supply. It is a general equilibrium mode, since in the absence of arbitrary limits (e.g. 'rigid money wages'), the values of all variables are determined simultaneously, and given the 'parameters' of the model the solution is unique. The unrealistic general equilibrium solution necessarily implies full employment of resources. In this model there can be no involuntary unemployment as such,⁹ a powerful ideological conclusion that places the blame for unemployment upon the working class itself (or, at least, its leaders), and pre-empt all serious criticism of a capitalist economy. Indeed, taken to its logical conclusion in the hands of the 'Rational Expectation' school, we learn from the neo-classical general equilibrium model that the Great Depression which prompted Keynes' *General Theory* never, in fact, occurred.¹⁰

So we are at all times clear about the exact part of the model under scrutiny, it is useful to summarize it in a table. This is done in Table 10.1, where salient characteristics are briefly elaborated. As can be seen, the functions involve variables which conveniently and purposefully divide themselves into the 'real' and the 'monetary'. The real variables are consumption, investment, output and employment, as well as the capital stock which appears implicitly. The precise sense in which these variables are real is a subject of some controversy, as we shall see. The system apparently has three price variables (the price level, the money wage and the interest rate), but whether all three function as prices in the model is also subject to question. Finally, there is the 'money supply'.¹¹ Though it is by definition a monetary variable, it has a real form, represented by M^*P , the purchasing power of money.

In anticipation of the critique of this model, we now consider its analytical progression. Presume the system initially to be

Table 10.1: *The neo-classical macroeconomic general equilibrium model*

Functional relation	Arguments	Comment
1. Investment=savings relationship (the IS curve)	$y = c(y,r) + i(y,r)$	y, c, i in physical units, 2 commodities on expenditure side
2. Money demand= money supply (the LM curve)	$M^*P = L(y,r)$	money supply given, bonds also appear as financial asset
3. Production function	$y = f(N)$	capital stock given, only one commodity in production
4. Labour demand	$W/P = f'(N)$	wage rate denominated in units of the only commodity produced
5. Labour supply	$N = g(W/P)$	supply price of labour denominated as in no. 4, above.

Guide:

y	= real output
c	= real consumption
i	= real investment
N	= employment
r	= interest rate
P	= price index of real output
W	= wage rate in monetary units
M^*	= money supply

characterised by 'perfectly flexible wages and prices', and that in any non-equilibrium state, the response of sellers and buyers is to adjust prices not quantities. Since the system is a general equilibrium one, a starting-point is arbitrary; but it is convenient to begin with the labour market, since the general equilibrium solution will necessarily require $N^d = N^s$. If labour demand by firms is less than the supply offered by potential workers, then the sellers of labour services respond by offering those services at a lower price. The lower price reduces costs of production and induces capitalists to expand output and hire more workers. An increased output requires more money to circulate it, since the transactions velocity of money is constant (but not the average velocity, considering all uses of money).

However, the supply of money is given, so more output cannot be

particular way Keynes achieved this monetizing of the labour unit, converting it into the 'wage unit', resulted in a concept of extremely limited use. This, perhaps as much as Keynes's own ambivalence about abandoning marginal productivity theory, explains the still-birth of the labour unit as a concept of analysis. Finally, I present Marx's solution to the relation between money values and material production, and argue that it provides a way forward in macro-economic analysis.

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characterised by 'perfectly flexible wages and prices', and that in any non-equilibrium state, the response of sellers and buyers is to adjust prices not quantities. Since the system is a general equilibrium one, a starting-point is arbitrary; but it is convenient to begin with the labour market, since the general equilibrium solution will necessarily require $N^d = N^s$. If labour demand by firms is less than the supply offered by potential workers, then the sellers of labour services respond by offering those services at a lower price. The lower price reduces costs of production and induces capitalists to expand output and hire more workers. An increased output requires more money to circulate it, since the transactions velocity of money is constant (but not the average velocity, considering all uses of money).

However, the supply of money is given, so more output cannot be

circulated unless there is an endogenous adjustment. This endogenous adjustment occurs through two mechanisms: (1) since money wages fall, unit costs fall, resulting in greater than normal profits, and competition erodes these supra-normal profits by reducing prices; and (2) the excess transactions demand for money pushes up the interest rate, which lowers bond prices, inducing wealth-holders to shift from money to bonds thus releasing money for transactions purposes. Thus, the increased output is circulated by virtue of lower unit prices and a shift of money from idle balances to active circulation. It now only remains to determine the distribution of expenditure between consumption and investment, and this is dictated by the interest rate.

The analysis is not significantly changed if one introduces arbitrary limits to variables; the result is to generate an 'unemployment equilibrium'. If, for example, the money wage rate is fixed and above its full employment level, then the money wage implies a price level inconsistent (too high) for full employment, given the exogenous money supply. Each solution is unique, however, in the sense that if any one variable is arbitrarily set, unique values for all the others are implied.

There is hardly an aspect of this model which has not come under devastating attack from within the orthodox analytical framework of the economics profession. Indeed, what is amazing is that not only does the model survive robustly, but is presented to students and used in policy-making as if these criticisms were trivial and peripheral.

Now over thirty years old, the 'capital critique' (or 'capital controversy') undermines the entire supply side of the model. What this critique demonstrates is that the 'capital stock' cannot be taken as given except in the case of a one-commodity system. Note that this has nothing to do with the question of whether or not the system is in equilibrium. The often given defence of marginal productivity theory, that it 'holds in general equilibrium', refers only to the uniqueness of a particular solution, and not the comparison of general equilibrium states. Consider two systems in general equilibrium which differ from each other in that in one the real wage is higher and the profit (interest) rate lower than in the other. It is not possible to say in which system the capital:labour ratio will be higher.¹² Therefore, it is not possible in a multi-commodity system to presume that workers offering their labour services at a lower money wage (implying a lower real wage with prices momentarily constant) will result in the rational capitalist selecting a lower capital:labour ratio. On the contrary, it may be the case that the lower real wage results in a higher capital:labour ratio for a given

level of output. Thus, the neo-classical model is necessarily a one-commodity model on the production side. I return to this point below.

With regard to its analysis of monetary phenomena, the model suffers from another serious and potentially devastating difficulty. The entire monetary analysis turns on the concept of an exogenous money supply. In H.G. Johnson's words: 'if the supply of money is not determined by factors independent of the demand for money, we have no basis for analysis.'¹³ The reason for this is easily seen: since money is valueless, the price level in the system is determined by the relationship between money in circulation and 'real output' (given the transactions velocity of money). If the money supply is endogenous then the price level is indeterminate within the model, as are money wages. Since equilibrium values of the 'real' variables require the adjustment of monetary variables, the entire system becomes indeterminate except explicitly as a barter economy.

The assumption of a 'given' money supply is neither empirically justifiable nor consistent with the theory of money itself. Textbooks in monetary economics tell us that anything can serve as money as long as it is consistently accepted by the parties to exchanges. If this is the case, how can the authorities fix the money supply? Indeed, does the term 'money supply' have any meaning when money has no value and can be created in private transactions (at least in principle)? Of course, the assumption of a given money supply is a theoretical simplification (abstraction) which no one seriously argues corresponds to reality. However, the central issue remains: is this a theoretically valid abstraction? The justification of the view that the 'authorities' control the money supply is based upon a particular theory of bank behaviour, which has been questioned by a number of neo-classical economists.¹⁴ Further, considerable doubt has been cast upon the idea of an exogenous money supply on institutional and empirical grounds with the Radcliffe Report being the best-known presentation of the view that the supply of money adjusts endogenously to the level of transactions.¹⁵

A new generation of theoretical criticism has called other aspects of the model into question, criticisms associated with the 'post-Keynesian' school. The general import of these criticisms is that the neo-classical model is constructed in such a way that the monetary aspect of a capitalist economy is trivialized. One aspect of this, stressed by Leijonhufvud and Chick, is that the use of the aggregate production function (even if one suspends disbelief and ignores the capital controversy critique) renders the system one in which relative prices play no role.¹⁶ Since there is only one commodity, there can be only one commodity price, and it is open to question what

'price' means in such a context. In effect, 'the price of output' in this context serves only as a deflator allowing us to revert to barter analysis.

Working within a one-commodity system has a number of important theoretical implications, not the least of which is the begging of the aggregation question. Independently of the problem of specifying the aggregate production function, the concept of 'aggregate output' is theoretically valid only if the relative prices of the commodities which make up the aggregate are invariant as the endogenous variables in the system change. This implies that the price of consumer commodities relative to investment commodities must be unaffected by movements in the rate of interest (or rate of profit), a rather strange result indeed. This invariance with respect to the interest rate has prompted critics to point out that in the model the rate of interest is not a price at all, but merely the rate of transformation of present into future consumption.¹⁷ In any case, there would seem to be something basically amiss in a model in which expenditure behaviour is specified separately for consumption and investment, and in the same breath the relative price of the two types of commodities is assumed invariant. Consider the impact of an exogenous upward shift in investment when the system is in full employment equilibrium. One consequence of this must be a change in the composition of output, with investment commodities increasing their share of 'real output'. But somehow the new excess demand for investment commodities must be signalled to producers and then eliminated by increased production, all in the context of no relative price change before, during or after.

The necessity of using the one-commodity assumption is inherent in the neo-classical macro-model, and the comments so far do not exhaust its implications. It is closely related to another common aspect of the model, that there is no 'money illusion' and the demand for commodities is 'homogeneous of degree zero in prices and income'. This implies that a proportionate increase in prices and incomes leaves the consumer at the same point on his/her indifference map. While simplistic examples can be imagined to lend credibility to such an assumption,¹⁸ it is based, in fact, on the presumption of a single commodity. The real importance of the 'homogeneity postulate' presents itself in labour market analysis. In a one-commodity economy, workers consume the same product which they produce, so that there is no difference between the cost of labour services from the point of view of capitalists and the standard of living: one is merely the reciprocal of the other. As a consequence, deflation (W/P and P/W) is not merely a 'real calculation' on the part of economic agents, but the implicit treatment

of the capital-labour exchange as barter.¹⁹ In consequence, the 'behavioural' assumption that workers are not victims of 'money illusion' is merely the restatement of the equilibrium condition for the labour market in the guise of an adjustment response to disequilibrium.

The neo-classical macroeconomic model is not basically an analysis based on simplifying assumptions; simplification is unobjectionable and necessary in all theorizing about social phenomena. Rather, the model is an analysis upon *prima facie* absurd premises which quickly manifest their logical inadequacies.²⁰ These become modes of thought whose contradictions fade through repeated use and familiarity. These assumptions are well characterized by Leijonhufvud as tribal myths,²¹ whose acceptance comes through constant repetition and the ostracism of dissenters.

However, there is a theoretical aspect of the one commodity system which has been insufficiently stressed by critics. Its essential role in the neo-classical macro-model is to resolve the relationship between money value and material production, a central problem of political economy which we stressed in the introduction, and which is the theme around which the remainder of the discussion revolves.

Value and production

The neo-classical composite commodity

Some habits of thought are so engrained in the thinking of economists that not only do they go unquestioned, but those who raise doubts are judged to be poorly trained, mentally deficient, or some mixture of both. One of these habits of thought is the concept of 'output', and its index number-haunted familiar, 'real output'. If the common man or woman were asked, 'What is the output of the coal industry', the humble informant no doubt would answer, 'coal'; and if particularly well-informed, he or she would quote a certain tonnage of coal referring to some discrete time-period. The same informant would, of course, be surprised to discover from the neo-classical economist that the coal industry does not for purposes of economic theory produce coal, but value added; and the fact that something that goes on in the coal industry results in a product which can be burned in a grate to generate heat is of no theoretical importance (except as a source of utility to the consumer).

Any first-year student of economics knows well how to model the activity of a coal-producing firm (or any other). Output is obtained by combining capital and labour, the former fixed in the short run and the latter subject to diminishing returns. If coal firms are cost-minimizers, then these two factors are used according to the rule

that their prices equal their contributions to output at the margin. Further, assuming no other factors of production and no depreciation, the 'output' of the coal firm is equal to wages plus profits (or, more euphemistically, labour income plus capital income), $W + P = pQ$.

A moment's reflection results in the nagging doubt that we may have a tautology here. The 'Q' in the equation, purporting to be a certain amount of coal, is not in fact the amount of coal which either exits from the pit or appears on the market during a discrete time-period. Rather, it is the amount of coal which is equal to wages plus profits. It is to be noted that this problem of relating a portion of the output to the value added generated (and to do so in a way which is not tautological) has nothing to do with the famous 'index number problem'. It arises even in the case of a homogeneous material output such as coal. Keynes was considerably disturbed by the tautological definition of 'output', which represented the conventional wisdom even in his time. The habit of thought in which 'output' equals value added has such a powerful grip upon the profession that the chapter in which he expresses his concern is probably the least read of the *General Theory*.²²

The problem of relating money value to material product in this manner ($W + P = Y$) is in no way reduced by moving from the level of the firm to the economy as a whole, but only obscured by incantating warnings against the sin of 'double counting'. At the level of the economy as a whole, the familiar aggregate production function tells us that the production of 'final goods' arises from the combination of labour and capital, and that this 'real output' resolves itself into factor incomes (wages plus profits in the simplest case). Yet clearly the collection of machinery available to society in any moment, combined with the workers to operate that machinery, does not in fact produce only 'final goods', but also produces intermediate commodities. Thus, the neo-classical 'output' which is the result of labour using machines is not the actual commodities emerging from production processes, but the income generated in these processes. The well-known aggregate function $Y = f(K, L)$ is not a production function, but a *value-added function*.

The question then arises, in what units is this value-added function to be measured? This is the point at which the index number problem arises. Monetary units will not serve, for this would render the function a complete tautology, making $Y = W + P$ a function of WL and rK (wages times the number employed plus the rate of return times the capital stock). Measurement must be in terms of some commodity or commodities. If the system produces more than one 'final good', then measurement is possible only if (1) the various

commodities are always produced in the same proportion, or (2) their proportions change, but they are combined by an unchanging weighting system. The first solution is tantamount to assuming a single commodity, as many writers have pointed out. The second solution is the index number problem in its pure form, since the set of weights neo-classicals have in mind are commodity prices of some base period.

The need for neo-classical production theory to restrict itself to a one-commodity world thus arises prior to the phenomenon of re-switching which has dominated the theoretical debate over the value-added function. Sraffa offered a solution to the problem of how to relate the income generated in production to the quantity of commodities produced, but this solution is itself a critique of marginal productivity theory and implies its invalidity.²³

The basic problem with neo-classical aggregate production theory is that its solution to relating the value of output to material output is on the one hand trivial and on the other fraught with internal contradictions. In as far as the solution is based upon an aggregate production function in a one commodity world the solution is trivial. Under these conditions, value production is material production, and the 'aggregate supply of final commodities' identically equal to income generated. The identity stands because there is no intermediate production in the system. When expanded to include more than one commodity, the theory takes on characteristics similar to that of the Ptolemaic system of celestial motion, with addition assumptions and restrictions complicating the model in the manner of epicycles. The function of these is not to bring the analysis closer to the concrete, but to render it increasingly abstract in order to provide logical support for established modes of thought.

Keynes on aggregation

Among the least noted parts of the *General Theory* are its passages treating the problem of aggregation. These are largely ignored even by those taking issue with neo-classical aggregation procedure with their critique apparently inspired by Keynes.²⁴ The lack of attention given to them is in contrast to Keynes' statement that proper choice of units of measurement and the definition of income were two of the 'three perplexities which most impeded my progress'.²⁵ At an early stage in the *General Theory*, Keynes takes issue with his contemporaries' treatment of aggregation:

The National Dividend, as defined by Marshall and Professor Pigou, measures the volume of current output or real income, and not the value of output or money income. . . . But it is a grave objection to this definition for such a purpose [formulating economic models] that the

community's output of goods and services is a non-homogeneous complex which cannot be measured, strictly speaking, except in certain special cases, as for example when all the items of one output are included in the same proportions in another output.²⁶

It would appear from the last part of this quotation that Keynes' concern is over the problem of weighting, the index number problem as such. However, it quickly becomes clear that his disquiet is not with the relatively banal (though unsolvable) difficulty that index numbers ignore substitution effects. This we see in his famous reflection upon the content of comparing the relative happiness and statecraft of Queens Elizabeth and Victoria.²⁷ Indeed, he explicitly accepts price and quantity deflators as valid tools for calculating historical comparisons of income and welfare. His objection is not to statistical measures, but rather to conceptual devices employed in abstract modelling; namely, the 'general price level' and 'real income'. These 'vague concepts' that are 'awfully imprecise and approximate', whose use should be limited to cases 'when we are attempting historical comparison'.²⁸

His particular objection is to the concept 'real income', whose 'precise definition is an impossible task'.²⁹ With this conclusion in hand, Keynes abandons the concept of 'real income' altogether for purposes of theorizing, and in doing so, abandons also the marginalist camp. For if real income cannot be defined precisely, the aggregate output which is the result of combining capital and labour is a will-o'-the-wisp, having the role in economics played by the unicorn in zoology. His analysis, he tells us, will use other categories,

In dealing with the theory of employment I propose . . . to make use of only two fundamental units of quantity, namely quantities of money-value and quantities of employment. . . .

It is my belief that much unnecessary perplexity can be avoided if we limit ourselves strictly to the two units, money and labour, when we are dealing with the behaviour of the economic system as a whole.³⁰

If we do 'limit ourselves strictly' to money and labour, then we necessarily must reject the entire neo-classical macroeconomic model, since all of its equations are calculated in units of 'real income/output' or employ the 'imprecise and approximate' measure identified as the general level of prices (see Table 10.1). Here in Chapter 4 of the *General Theory* Keynes makes a fundamental break with his fellow economists (and subsequent ones). What is involved is much more profound than merely a selection of appropriate units. Indeed, it is unfortunate that he called Chapter 4 'The Choice of Units', for it would be better described as 'Choice of Method'.

The choice of money and labour as theoretical quantities indicates a particular method of abstraction. These are not concepts created by the mind of the theorist, but categories the theorist confronts in the concrete ('real world'). While neither is a simple category – many things can serve as money and labour comes in many varieties – for all of their complexities they are categories which cannot be refuted, discredited through logic. One can argue that they are not the appropriate categories upon which to construct a theory of employment, but one cannot question their validity. In other words, here Keynes has not created abstractions, but drawn his abstractions out of the confusing complexity of reality. At this point, at least, his basic method of abstraction is similar to that employed by Marx, who selected the category 'commodity' from the concrete in order to construct his theory.³¹

Neo-classical categories are by contrast creations of the theory in many cases. 'Utility' is an obvious example, which imposes a certain interpretation upon consumption, income and leisure, when other interpretations are possible.³² The concept of 'real income/output' is also a mental construct, with no direct analog in the economic process. While obviously people's material circumstances improve and deteriorate, and countries at different times produce more and less wealth, these do not in the concrete take the form of a homogeneous or composite commodity, much less one which can be continuously differentiated with respect to labour and capital. Real output, the general price level, and the stock of capital are all concepts whose relation to reality is not obvious, which accounts for their 'imprecise and approximate' character.

Whether or not Keynes was aware of the basic methodological distinction between ideal abstractions (creations of the mind) and abstractions drawn from reality is difficult to judge, for one finds little explicit treatment of methodology in his writings.³³ However, there is considerable circumstantial evidence in the *General Theory* to suggest that at the very least he had a strong intuition that reality should inspire theory. This orientation manifests itself frequently, particularly in his discussion of expectations, where his abstract analysis continuously interacts with his concrete experience of the financial world of his time.³⁴ His open contempt for mathematic models is another example.³⁵ Even more striking by its contrast to neo-classical theory is his lengthy discussion of the basis of the macro-economic variables income, consumption, investment and saving, all of which are defined with reference to the categories of the capitalist enterprise, prior to employing them in an abstract model.

For one used to neo-classical parables such as 'capital arises in

the abstinence from current consumption', Keynes' method of definition is extraordinary. His definitions are all derived from the cash-flow or net worth position of capitalist firms. Income, for example, is defined as the sales of the capitalist firm, minus purchases from other firms, with a complicated adjustment for the change in the value of equipment.³⁶ Here he has been faithful to his pledge to adhere strictly to money values, as well as defining categories so they are directly quantifiable. More important theoretically, and little noted, his treatment of income involves no tautological identity with aggregate supply. Income in the *General Theory* is *not* the value added generated by the production of final goods and services (as in the neo-classical production function), but business receipts from sale of all commodities, minus intermediate costs (user cost).

Further, because this conceptualization of income is empirically based, it is necessarily dynamic, while the neo-classical concept, real income = aggregate supply, is static. Neo-classical theory income determination is static because of its comparative static, general equilibrium context. But methodological causality runs the other way, too: the measure of income itself is static, based upon 'normal economic motives in a world in which our views concerning the future are fixed and reliable in all respects'.³⁷ Neo-classical real output is that income which accrues to the factors of production when all firms use the same technique, with technology unchanging, and capital values given.

Keynes' money income is defined and measured net of anticipated and unanticipated changes in the value of equipment and inventories due to the interaction of technical change and competition.³⁸ In the concrete operation of a money economy, capitalist firms continuously suffer capital losses or enjoy capital gains as a result of price changes. These, in turn, affect the distribution of cash flow between factor incomes and non-factor costs. If technical change results in a fall in the value of the firm's equipment, then the full value of the equipment at time of purchase cannot be recaptured in product sales. This fact of business life, which is independent of the issue of whether expectations are fulfilled or not,³⁹ shows why it is necessary to define income independently of the production of final commodities (aggregate supply).⁴⁰ Because of changes in the valuation of equipment and stocks, money income may be less, the same, or more than the money value of consumption commodities plus investment commodities.

Thus, in Keynes' theory there are three aggregates, defined independently of each other (though not functionally independent):

1. total factor income, equal to sales minus intermediate cost, with adjustment for accumulation of equipment and changes in the value of stocks and equipment due to price changes;
2. aggregate supply of final commodities, the consumption and investment commodities which capitalists place on the market; and
3. aggregate demand, the expenditure by workers and capitalists on consumption commodities, and the expenditure of capitalists on investment commodities.

In neo-classical theory there are only two aggregates for the first two above are the same by definition. To my knowledge, Keynes and Marx are the only important theorists to distinguish clearly these three aggregates, though Marx did so on a quite different basis.⁴¹ With only two aggregates, macroeconomics is the analysis of the matching of expenditure and income (value added), so we do indeed have an 'income-expenditure' model in the strictest sense. With three aggregates, the analysis is inherently dynamic, which partly explains how Keynes could consider dynamic processes while employing what appears to be comparative statics, an apparent contradiction commented upon by numerous authors.⁴²

Before turning to Keynes' specification of aggregate supply and the labour unit, it is important to bring out a further characteristic of his treatment of income in Chapter 6. It is to be noted that income is defined with reference to the *total value* of entrepreneurial sales and stock accumulation.⁴³ In this procedure, it is the total money value of commodities which is taken as the independent variable. That is, Keynes agrees with the person in the street that the value of coal is equal to the price one pays for it, not the wages paid out by coal firms plus the profits they obtain.

Treating the value of commodities as their true value – intermediate cost plus factor income – brings Keynes close to a full break with marginalist value theory. On this basis, he could move on to relate the money value of commodities to their material production and completely break the income-output tautology. Indeed, in his appendix to Chapter 6, he seems on the verge of this step. After defining 'user cost', whose largest component is in general materials cost, he says that user cost 'has, I think, an importance for the classical [marginalist] theory of value which has been overlooked'; and that,

The concept of user cost enables us, moreover, to give a clearer definition than usually adopted of the short period supply price of a unit of a firm's saleable output. For the short period supply price is the sum of the marginal factor [labour] cost and the marginal user cost.⁴⁴

The reason for this clearer definition arises from the nature of commodity prices themselves, as he goes on to say.

Whereas it may be occasionally convenient in dealing with *output as a whole* to deduct user cost, this procedure deprives our analysis of all reality if it is habitually (and tacitly) applied to the output of a single industry or firm, since it divorces the 'supply price' of an article from any ordinary sense of its price...⁴⁵

If one continues down this road, the labour theory of value awaits the traveller, or at the least, the Straffian standard commodity. With explicit consideration of intermediate costs, a part of the value of a commodity (however measured) is not created in production but represents the passed-on value of other commodities. Since a machine also passes on its value through depreciation in use – what Keynes calls the 'sacrifice' of equipment⁴⁶ – it is not at all clear why equipment should be singled out among non-labour inputs for the distinction of creating value. Keynes was well aware of this line of logic, and explicitly endorsed it in a strikingly nineteenth-century classical passage in his chapter on capital.

It is much preferable to speak of capital as having a yield over the course of its life in excess of its original cost, than as being *productive*...

I sympathise, therefore, with the pre-classical doctrine that everything is *produced by labour*, aided by what used to be called art and is now called technique, by natural resources which are free or cost a rent according to their scarcity or abundance, and by the results of past labour, embodied in assets, which also command a price according to their scarcity or abundance. It is preferable to regard labour... as the sole factor of production, operating in a given environment of technique, natural resources, capital equipment and effective demand. *This partly explains why we have been able to take the unit of labour as the sole physical unit which we require in our economic system, apart from units of money and time.*⁴⁷

Thus, we find a consistent thread of argument from the definition of income via user cost to some labour-based value theory. The labour-based value theory would then provide the link between material production and money aggregates, the first measured in homogeneous labour units and related to the second via a theory of the purchasing power of money. When these passages are extracted from context and strung together, it appears that Keynes was on the verge of a Newtonian revolution in economics. One possible theoretical line coming out of these passages is the mark-up theory of pricing claimed by some post-Keynesians as the true microeconomics of aggregate analysis.⁴⁸ However, Keynes' explicit endorsement of a labour-based value theory would provide a considerable improvement upon the current mark-up literature.⁴⁹ A major empty box in mark-up models is the theory of total profit, for while the

degree of monopoly might be a plausible explanation of differential mark-ups, it cannot explain the average mark-up for the economy as a whole.⁵⁰ A labour-based value theory resolves this problem, since wages plus profits equal the current labour input, and the division between the two can be determined in a number of ways.⁵¹

However, these quotations from Keynes are passages taken out of a basically marginalist context and can by no stretch of the imagination nor textual interpretation be said to characterize the *General Theory*. After in one place carefully defining the concept of user cost and warning the reader that industry supply curves should not be constructed on the basis of marginal labour cost alone, Keynes proceeds to abandon his own advice and use supply functions net of user cost.⁵² Whatever might be the validity of specifying aggregate demand and aggregate supply net of user cost, it is a complete tautology to specify industry demand and supply in this way. Industry supply net of user cost is the value added of the industry. But the expenditure by purchasers on an industry's output minus user cost yields no recognizable economic category; it is purely arbitrary. It is not the industry's value added (though it may equal it if supply equals demand), and it does not equal the final demand for the industry's output. If the industry produces a consumer commodity or an investment commodity, its entire output is 'final', and nothing should be netted out, neither from the supply function nor from the effective demand function. If the industry produces an intermediate commodity, then none of its demand is final, net or gross of user cost. Thus, specifying industry supply and demand functions net of user cost is arbitrary, and cannot be the basis for aggregation to economy-wide aggregate supply of 'final goods' on the one hand, and the effective demand for these, on the other. This is what Keynes does, though warning the reader against such an exercise. At the end of Chapter 6, he writes:

It is easily shown that the conditions of supply... can be handled in terms of our two chosen units [money and labour]... without reference to quantities of output, whether we are concerned with a particular firm or industry or with economic activity as a whole.⁵³

This is allegedly achieved 'for a given firm (and similarly for a given industry or for industry as a whole)', by the following function,

$$Z_r = \phi r(Nr^r).$$

Where Nr is employment and Z_r 'the return expectation of which will induce a level of employment Nr^r '. It is quickly clear that this rather vague and convoluted definition of Z is nothing more than

price times quantity. For he then specifies an output function, $O_r = w_r(N_r)$, and writes,⁵⁴

$$p = \frac{Z_r}{O_r} = \frac{\Phi_r(N_r)}{w_r(N_r)}$$

Once an output function is introduced as the implicit basis of the aggregate supply function, we are back to a neo-classical-style production function which Keynes proclaimed that he wanted to avoid. The close kinship of the Z-function to the familiar $Y = f(K, L)$ is shown in Chapter 20 when Keynes does some mathematical manipulations. Here he is considering the elasticity of employment with respect to changes in aggregate demand, and we are told that in general the first derivative of Z with respect to N is less than unity. In other words, there are diminishing returns to labour. Just as a rose by any other name would smell as sweet, a functional relationship between output and labour in which the addition of labour results in diminishing returns is a neo-classical production function, whatever it may be called.⁵⁵ Thus, the neo-classical synthesis model with a one-commodity aggregate production function can find a close cousin, if not a virtual twin, in the *General Theory*.

In summary, one can conclude that Keynes was certainly concerned with the marginalist treatment of the relationship between material production and money values. He was concerned enough to propose some of the elements of an alternative treatment, and to include in passing an endorsement of pre-marginalist value theory. However, he was not concerned enough to abandon marginal productivity theory, preferring to incorporate it into a theory of employment whose innovative features were the stress on effective demand, the dynamics of a money exchange economy, and the role of expectations.

Marx on value and production

In the economics profession Marx is treated as a bizarre eccentric to be ignored or a dangerous dogmatic to be refuted (usually in the form of a straw man). This is unfortunate, but not surprising, for Marx was a bitter critic of the economic system which provides the livelihoods of most economists. Much of the treatment of Marx's contribution directs itself to his value theory. Obsession with Marx's theory of value and exploitation has resulted in little attention being directed to his analysis of capitalism as a money economy, even by Marxists.

It was argued above that a fundamental problem when analysing

a money economy is the relationship between the values generated by production and the material output of production. Only when this relationship is specified can one produce a theory of distribution, employment and accumulation. An analysis of distribution presupposes a determinant quantity to be distributed; a theory of employment is derivative from a theory of what the employed produce; and accumulation must ultimately be limited by material production over and above current resource use. Neo-classical theory, as we have seen, provides a particular solution to this analytical problem. Output is apparently defined in 'real' terms. The move from quantities to money value is achieved via the quantity theory of money. This formulation of the relationship between physical quantities and money values becomes increasingly complex and intricate due to the contradictory nature of the basic concepts, real output/income and money.⁵⁶ While the purpose of elaboration and complexity should be to move theory closer to reality, in the neo-classical synthesis greater complexity makes theory more at variance with reality and increasingly limited even in formal application. The analytic movement is from the abstract to the more abstract,⁵⁷ until one reaches the point where the apparently simple parables hold only in general equilibrium states.

Keynes was not content with this theoretical method. In the *General Theory* his attempt is to theorize in a way that moves the analysis from the abstract to the concrete, so that complications reveal rather than obscure the great variety of economic phenomena. He did not, however, break with the marginalist solution to the relationship between material quantities and money values. His alternative, with the labour unit playing the role of theoretical mediation, is so fraught with analytical difficulties⁵⁸ that it is hardly surprising that subsequent economists retreated to the pre-Keynesian solution.

Considerable literature has been devoted to Marx's theory of the value of commodities. Virtually none has taken up his macro-economics as such, what he called the analysis of the circulation of commodities, though recent work by Foley could be interpreted as doing so.⁵⁹ Marx argued:

[T]he difficulty [in aggregate analysis] does not lie in analysing the value of the social product itself. It arises when the value components of the social product are compared with its material components.⁶⁰

That is, the problem arises when, as one must, the theorist seeks to relate the money income generated in production to some portion of society's output. To say that income is the money value of 'final goods' is sheer tautology except when there is equilibrium in

the goods market. If there is excess demand or excess supply in the goods market, then money income maps on to the production of final goods only because convention defines inventory change as investment.⁶¹ But if we define 'final goods' as those bought by the consumer or by capitalists with the characteristic of being used to produce other goods and having a life longer than the current period, then in general, money income does not represent the quantity of final goods produced. And if one accepts the assertion that economies are never actually in equilibrium, then it follows that money income never corresponds with the production of final goods, measured in real or money units. How, then, is income to be related to production?

Marx sought to resolve this problem with a two-part argument. First, he pointed out that every commodity has two aspects – it has an exchange aspect (its price) and a material aspect. The difference between the two is manifested in any exchange, in which the seller appropriates the money value of the commodity, and the buyer takes possession of its material form. The point is an obvious one. Modern macroeconomics, following a tradition going back to Adam Smith,⁶² treats the material character of commodities as being of no analytical importance, focusing solely upon the value added generated by production. This treatment is justified by arguing that to do otherwise would be 'double-counting'. However, the double-counting argument is merely the way one measures value added with logical consistency. It is not a defence of why macroeconomics should address itself to value-added aggregates rather than total commodity value inclusive of intermediate costs. For example, input-output analysis does not make double-counting errors, though it analyses commodity production and circulation in terms of the gross value of those commodities.

In Marx's theory of circulation, the 'price' of a commodity corresponds to what one normally means by that term – what is paid for it. With prices defined in this way, he must necessarily include on the production side all of the inputs that constitute the cost of production, including those consumed in production – intermediate commodities. We should note that 'intermediate' here is defined with respect to each commodity, for the output of any production process may serve as the input to another. Further, for the economy as a whole, the flow of new products over a period includes articles of personal consumption, equipment, and inputs which will be consumed in production in the next or subsequent periods. It is true, of course, that theoretical situations can be constructed in which value added is equal to the money value of consumer commodities and investment commodities, or even where value added equals

consumption commodities alone and net investment is zero (Marx called the latter situation 'simple reproduction').

However, even in these two cases the value of intermediate commodities cannot be said to be included within the value of final commodities, nor their demand derivative from the latter. These intermediate commodities will be carried forward and consumed in the production of commodities in the subsequent period. Further, the demand for intermediate commodities produced but not used in the current period is obviously not determined by the demand for final commodities in the current period, but the demand for the latter in subsequent periods. Finally, some intermediate commodities of the current period go to produce intermediate commodities in the next period, in an infinite chain that never involves a final commodity. This implies that a portion of total output is never incorporated into final commodities in any meaningful sense.

For a neo-classical theorist such an argument is like passing from a Euclidian to a non-Euclidian world, in which suddenly one encounters impossible angles and shapes. These non-Euclidian flows never appear in a neo-classical model because it is an equilibrium-based system in which time does not exist; and, more fundamentally, commodities are not produced, but rather it is income that is produced. Because income or value added is by its nature homogeneous, the temptation to employ a one-commodity assumption is irresistible.

The great advantage of the gross product approach to macroeconomics is that it corresponds to the way economics actually function – commodities are in fact produced with intermediate products. This, however, is an argument that would leave most economists cold, notwithstanding how sensible it is. In terms of abstract analytics, considering the gross product lends an inherent dynamism to the theory, with each period organically linked to the next through the current use of past production. Instability can be analysed in terms of the conditions of production (productivity and costs) in one period differing from conditions of exchange (income flows and demand) in the next. Technical change, banished to the 'long run' in neo-classical (and post-Keynesian) analysis serves as the major destabilizing factor. Commodities carry forward stamped with the production conditions of a particular kind, entering circulation with market conditions unsettled by innovations. In this way, one can consider the gains and losses in capital values which Keynes stressed in the *General Theory*. Further, this framework is well suited for incorporating expectations.

However, the gross product framework would seem to suffer from at least one serious difficulty. By considering the material

character of commodities, has it not abandoned macro-aggregates altogether and reduced the economy to an infinite number of markets and production processes? At this point, one moves to the second step in Marx's analysis, his method of aggregation. Marx's procedure was to divide all commodities between those intended for consumption by people and those intended for use in the production of other commodities. This division is not to be confused with either the intermediate/final commodity dichotomy nor the consumption/investment commodity distinction. Production commodities ('means of production') include both equipment (fixed capital) and inputs which are completely consumed in the production process.

This division of the total product implies an analysis of aggregate demand quite different from the Keynesian or neo-classical formulation. Production in the current period is initiated by capitalists advancing money in exchange for the means of production and labour services.⁶³ This exchange, money capital converted to productive capital in Marx's terminology, has some kinship with Keynes' 'finance motive', particularly in recent elaboration of that concept.⁶⁴ This advance of money capital determines the aggregate demand for the current period, directly for means of production and indirectly for consumption commodities by the payment of wages. Since the time-period of analysis corresponds to a production period, consumer commodities are produced and sold in the current period, while means of production sold currently were produced in the previous period. This treatment of production and sale, which corresponds to the way that firms operate, links each period with the next, as mentioned above.

This commodities-into-commodities framework captures a fundamental feature of capitalist economies which is largely lost in neo-classical general equilibrium: the impulse to production and exchange comes from the owners of capital, for output is determined by their decision about how much capital to advance. We find the same stress in Keynes' supply functions (for a firm, industry or the economy as a whole). However, in Marx's framework, the central role of 'entrepreneurs' is made much more explicit by dropping the derived demand treatment of inputs and labour, and considering the demand for these as the first step in commodity circulation and production.

This alternative macroeconomic framework, in as far as it is an analysis of markets and money aggregates only, is in no way dependent upon a labour theory of value.⁶⁵ The labour theory of value enters to resolve the fundamental relationship between the material aspect of commodities and their exchange or money

aspect. Means of production and consumer commodities are each aggregated on the basis of the labour time necessary to produce them, past and current, under prevailing techniques.⁶⁶ While aggregating by labour time certainly has its difficulties, these difficulties are probably less theoretically debilitating than those associated with the concept of 'real income'.

Conclusion

It is unfortunate that Keynes felt that Marx's contribution to economic science could be digested in an afternoon. This dismissal, along with his preference for Malthus over Ricardo, the other great value theorist of the pre-marginalist school, resulted in his discarding the foundation for an alternative to marginal productivity theory. Had he not been so taken by the kinship of his effective demand theory to the under-consumptionism he found in Malthus' apologetics for the British landlord class, he might have given Ricardo his due, as Marx certainly did.⁶⁷ However, had Keynes pursued the Ricardian and Marxian insights, it is quite possible that he would have been written off by his fellow economists as a hopeless eccentric, for the majority of them found even his innovations within the marginalist framework to be unpalatable. Had Keynes taken the more radical route and made a clear break with his 'classicals', the fiftieth anniversary of the *General Theory* might have gone unheralded by the economics profession.

Notes

1. Here comes to mind Keynes' famous comment that he read Marx in an afternoon.
2. An interesting discussion of Keynes on this issue is found in Fine (1980), pp. 46 ff.
3. Recent neo-classical literature has developed disequilibrium dynamics. This analysis remains in the context of a general equilibrium framework, representing a generalization of the basic neo-classical model of an inherently stable capitalist economy. See Muellbauer and Portes (1978).
4. See Leijonhufvud (1968), pp. 22 ff.; and Keynes (1936, ch. 21).
5. I shall use the term 'classical economics' to refer to the pre-marginalist economists from Smith to the latter Mill, as opposed to Keynes' use of the term John Brothwell, 'Why aren't we all Keynesians now . . .'. Chick argues that Keynes did not accept marginal productivity theory as one usually thinks of it, because his demand for labour is the *effective* demand, not the *rational* demand.
7. Chick, for example, to whom we refer below. See Victoria Chick, 'Time and the Wage-Unit in the Method of *The General Theory*: History and Equilibrium', in Lawson and Pesaran, (ed.) (1985).
8. Keynes, 1936, pp. 362-4.
9. For a clear discussion of this, see Harris (1981), pp. 241, 261.
10. On this extraordinary argument and an insight into how logic can subdue reality and lead to Bedlam as Keynes put it, see Sargent (1976) and Darby (1976).
11. Because the money supply is constant, it is not necessary to treat non-uniqueness which results from money being neutral.
12. This is because of 're-switching'. A technique which had been abandoned as too 'capital-intensive' in the high wage system, when (say) wages fell to their

- current level in that system, may be the prevailing technique in the low-wage system. Of the many discussions of re-switching, one of the clearest is in Fine (1980), pp. 96–118.
13. Johnson (1972), p. 59.
14. The neo-classical treatment of bank behaviour is critically assessed in Chick (1979), pp. 14 ff.
15. HMSO (1959).
16. Leijonhufvud (1968), pp. 89 ff.; and Chick (1983), ch. 7.
17. Leijonhufvud (1968), pp. 157–85.
18. Branson, for example, seeks to convince one of realism of this assumption by offering the case in which one morning we awake to discover that there has been a currency reform, so, for example, ten 'old pounds' will be replaced by one 'new pound'. The analytical correspondence between this example and an actual process of inflation with time lags between price changes and income changes – not to mention distributional effects – is not clear. Branson (1972), pp. 61–2.
19. See Chick (1983), ch. 7.
20. Other inadequacies we have not mentioned are: the inconsistency of Walras' Law with the Quantity Theory, the stylized treatment of market behaviour, and that Heath Robinson figure, the Walrasian auctioneer. On these, see respectively Harris (1981), pp. 58–60; Coddington (1983), pp. 92–4; Clower, in Hahn and Brechling (eds) (1965).
21. Leijonhufvud (1981), ch. 7.
22. These are Chapters 4 and 6, and appended to the latter, 'Appendix on User Cost'.
23. Straffa (1960), ch. IV).
24. Leijonhufvud (1968), for example, in his insightful chapter, 'The Aggregate Structure of Alternative Models', makes no reference to Keynes' lengthy discussion of economic aggregates, appearing in Chapters 4, 6 and 7 of *The General Theory*.
25. Keynes (1936), p. 37.
26. *Ibid.*, pp. 37–8.
27. *Ibid.*, p. 40.
28. *Ibid.*, p. 43.
29. *Ibid.*, p. 39.
30. *Ibid.*, p. 43.
31. For a brief discussion of Marx's method, see Weeks (1983), ch. 2 and appendix. Implicit in the concept of utility is a particular ends-means value judgement, postulating that work is the arduous means by which one achieves the pleasurable end of consumption (or non-work). On the arbitrariness of the ends-means dichotomy, see Leijonhufvud (1968), pp. 233–4.
32. Here we refer to methodology in the broadest, epistemological sense.
33. See Keynes (1936), chs 5, 11 and 12.
34. See Keynes (1936), p. 280, footnote, for example.
35. *Ibid.*, pp. 53–4. Again, comparisons with Marx present themselves.
36. See Marx's reference to empirical categories in the context of his analysis of value and surplus value. Marx (1976), ch. 15.
37. Keynes (1936), p. 294.
38. *Ibid.*, pp. 57–60, where he distinguishes between basic and current supplementary cost.
39. Whether anticipated or unanticipated, smooth or irregular, technical change results in the devaluation of old equipment – unless one believes there is no such thing as inferior technologies.
40. Keynes was quite explicit about this. Referring to his treatment of income, he says
- ... [W]e are still left with the advantage that we do not require at any stage of the analysis to allocate the factor cost between the goods which are sold and the equipment which is retained. (Keynes, 1936, p. 67)
41. Marx's treatment of aggregates is found in Volume II of *Capital*, where he brings forward from the first volume his distinction among money capital, productive capital, and commodity capital. The first corresponds to aggregate demand, the third to aggregate supply, and the second allows for the analysis of the generation of value added. Marx (1978), chs 1–3.
42. See Chick (1985); and Leijonhufvud (1968), pp. 50 ff.
43. In Keynes' notation, A is total sales, A_1 purchases of commodities from other capitalists, and G and G' the value of equipment and stocks at the beginning and end of the period over which income is measured. Current value accruing to the entrepreneur is thus: $A - A_1 + (G' - G)$. Current income is this money value minus expenditure on maintenance of equipment and stocks (noted as B by Keynes). For a rare (and not very sympathetic) discussion of Keynes' definition of income, see Tew (1953).
44. Keynes (1936), p. 67.
45. *Ibid.*
46. *Ibid.*, p. 53.
47. *Ibid.*, pp. 213–14, last emphasis added.
48. Eichner and Kregel (1975), p. 1276.
49. See Coddington (1983), pp. 92 ff.
50. Fine and Murfin (1984).
51. For an exposition of the argument that 'bargaining power' or 'class struggle' determines factor shares, along with a labour-based value theory to justify the argument, see Edward Nell, 'The Fall of the House of Efficiency', in Weintraub (ed.) (1973).
52. Keynes (1936), pp. 23–5.
53. *Ibid.*, p. 44.
54. He defines the price as $p = Z/O$, which he calls the 'ordinary supply curve'. It is unclear what he means by this, for it certainly is not the Marshallian supply curve, which is $p = MC$.
55. Chick has a different interpretation of the Z function, arguing, 'variations in output per man due to diminishing returns ... have been removed from the labour unit' (Chick, 1985, p. 205). She has pointed out that only in Chapter 3 of *The General Theory* does Keynes refer to a production function for output as a whole.
56. In particular, the re-switching phenomenon, the inconsistency between Walras' Law and the Quantity Theory, and the inclusion of the Walrasian auctioneer to avoid 'false trading'.
57. Coddington puts it succinctly:
- [I]n order to provide a basis for a manageable analysis of market phenomenon, the [neoclassical] analysis of individual choice has to be of a particularly stereotyped and artificial kind. (Coddington, 1983, pp. 92–3)
58. While sympathetic to Keynes' attempt, Chick judges it 'incomplete and unsatisfactory' (1985, p. 205).
59. Foley (1982). Straffa's analysis is a special case. While it considers material production, it does not have a theory of money values.
60. Marx (1978), p. 506.
61. Part of the accumulation of inventories represents intermediate commodities. Since they have not been incorporated in final commodities, they cannot be eliminated by a double-counting argument.
62. It would be a relatively familiar world to a Straffa, however, for we are describing 'the production of commodities by means of commodities'.
63. Marx used the term 'labour power' to refer to the commodity that workers sell. Graziani notes the intellectual lineage of the 'finance motive' from the work of Marx. Graziani (1984), p. 13. For an empirical study of the finance motive, see Smith (1979).
64. It is, however, inconsistent with the marginal productivity theory of value, since means of production, currently consumed or long-lived, pass their value

- (however defined) on to subsequent periods. That is, they cannot create value as the neo-classical 'capital stock' does.
66. Much recent debate in non-marginalist value theory is over the validity of aggregating in terms of labour time. See Steedman and Swezey (eds) (1981); and Weeks (1982), chs I and II.
67. Marx considered Ricardo to be the best representative of British or continental political economy, and devoted the lion's share of his history of economic thought (*Theories of Surplus Value*), to Ricardo's analysis.

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