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## Hamlet without the Prince: Cambridge Macroeconomics without Money

By J. A. KREGEL\*

Keynes' *General Theory* was exclusively concerned with a monetary economy in which changing beliefs about the future influence the quantity of employment. Yet money plays no more than a perfunctory role in the Cambridge theories of growth, capital, and distribution developed after Keynes. This essay attempts to explain this paradox with reference to the relation between Keynes' monetary revolution and the value theory revolution which simultaneously occurred in Cambridge in the 1930's.

### I. The Instability of Credit

The *General Theory* has often been described as provoked by the Slump, yet F. Vicarelli (1984) argues that it also represents the theoretical formulation of reflection on the nature of capitalism begun in the 1920's. Hayek describes this period: "We all held similar views...more fully elaborated by R. G. Hawtrey who was all the time talking about the inherent 'instability of credit'" (in Milton Friedman, 1969, p. 88n). Indeed R. G. Hawtrey's 1913 *Good and Bad Trade* foreshadowed a monetary theory of effective demand:

[T]he manufacturer's efforts in producing...goods depends upon there being an effective demand for them.... It is only because the dealer anticipates... this effective demand...that he gives the manufacturer the order.... The manufacturer...accepting the order, and the banker...discounting the bill,

are both endorsing the opinion of the dealer. The whole transaction is based ultimately on an expectation of a future demand, which must be more or less speculative. [p. 78]

The impact of money on the level of activity inspired not only Hayek and Keynes, but Robertson, Schumpeter, Pigou, Cassel, and others. These economists, to whom Keynes addressed his 1923 *Tract on Monetary Reform*, all implicitly accepted the quantity theory of money; open rejection of this common analytical framework in the 1930 *Treatise on Money* made communication with his contemporaries difficult, and Keynes had to look elsewhere for sympathetic criticism.

### II. Cambridge Value Theory in the 1930's

At the same time, a group of young Cambridge economists, Kahn and Joan and Austin Robinson, were extending Sraffa's 1926 criticisms of Marshall's theory of value to produce the "Imperfect Competition Revolution." It was among these economists, and others involved in developing imperfect competition such as Harrod, Kaldor, and Kalecki, that Keynes' ideas created interest. They did not, however, have first-hand experience of the earlier "monetary" debates, indeed, for many skepticism of the quantity theory (see R. F. Kahn, 1984, p. 52) deterred them from the study of monetary factors which had inspired Keynes' generation. Thus the Cambridge economists who formed the "Circus," and others such as Harrod, who played a central role in discussing and elaborating the *General Theory*, were all involved in the value theory revolution before they joined Keynes' monetary revolution. It is not surprising that they should have perceived a relationship, although Keynes believed that developments

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in value theory were independent of his own pursuits.

The *Treatise* replaced the equation of exchange as determinant of the price level with the “fundamental equations” which combined Marshall’s short-period supply and demand factors in a sort of reduced-form equation representing the composition of expenditure relative to the composition of output. Money retained only indirect influence on prices via the influence of the rate of interest on the divergence of saving and investment producing “windfall profits.” Here Keynes followed Wickcell and called “natural” the interest rate that produced price equilibrium. Keynes’ new interlocutors were to draw on their value theory expertise to provide two crucial elements for the transformation of the “fundamental equations” into the analytical framework of the *General Theory*: Kahn’s analysis of short-period supply and Sraffa’s conception of commodity rates of interest.

#### A. Kahn’s Short-Period Analysis

It was Mr Kahn [in his multiplier article] who first attacked the relation of the general level of prices to wages in the same way as that in which that of particular prices had always been handled, namely as a problem of demand and supply in the short period rather than as a result to be derived from monetary factors.

[Keynes, 1939, in 1973, p. 400, fn. 1]

Kahn also convinced Keynes that the price of investment goods should be handled in an analogous fashion, thus separating the combined supply and demand aspects of the fundamental equations which opened the way to an aggregate demand function representing consumption expenditures (from wages) and investment expenditures (from profits) and an aggregate supply function to determine the “aggregate” price level as an application of his value theory investigations into “short-period supply” to Keynes’ monetary studies. While others, such as Hicks, were applying value theory to the demand for money, in Cambridge it was being applied to the “fundamental equations.”

Indeed, Kahn (p. 99) considers his greatest contribution to Keynes’ theory as the demonstration that investment generates the savings required to finance it, which convinced Keynes to adopt savings-investment equality. This eliminated the second term of the fundamental equations and facilitated application of aggregate supply and demand analysis, but it also eliminated money from even an indirect role via interest rates on prices. Sraffa was to provide the new role for money and the rate of interest.

#### B. Sraffa’s Commodity Rates of Interest

In his 1932 review of Hayek’s *Prices and Production*, Sraffa formulated commodity rates of interest to criticize Hayek’s use of Wicksellian “natural” rates of interest (which had equated saving and investment in the *Treatise*). Hayek’s theory suggested that if the presence of money was “neutral,” the natural rate of interest would equate investment to full employment saving and Say’s Law would necessarily prevail.

Hayek’s “neutrality” required the money rate of interest equal the “equilibrium” (natural) interest rate so that money savings should buy the same amount of producers’ goods as if the supply and demand for capital met in “their natural form.” Sraffa pointed out that natural rates exist implicitly for every commodity, and explicitly whenever there is a forward market. These rates will be uniform in an equilibrium in which “the spot and forward price coincide” for each commodity. But when savings, whether in money or natural form, are positive there may be as many natural rates as there are commodities for:

[U]nder free competition this divergence of rates is as essential to... transition as is the divergence of prices from the costs of production; it is, in fact, another aspect of the same thing... [This] applies as much to an increase in saving, which Dr. Hayek regards as equivalent to a shift in demand from consumers’ to producers’ goods, as to changes in the demand for or the supply of any other commodity.

[1932, pp. 50–51]

Since it is the competitive price adjustment process, not the nonneutrality of money which causes divergence of individual commodity rates and these from the money rate, neutrality cannot be defined in the conditions Hayek proposed.

Sraffa's criticism suggested that the influence of money was not via interest rate effects on saving and investment, but via the divergence of commodity rates which was just "another aspect" of the divergence of demand prices from supply prices leading to production decisions for consumption or investment goods. The rate of interest provided a parallel representation at the level of individual production decisions for the divergence of aggregate demand and supply prices which was emerging from the elaboration of the fundamental equations, but one in which money was clearly central to the determination of the expenditure decisions which brought changes in production and employment.

### III. Interest Rate Parity and Liquidity Preference

In Keynes' monetary economy, money offered an alternative to investment in other durables; it thus required a comparable definition of its rate of interest in terms of spot and forward prices. Keynes thus defined the money rate of interest as "nothing more than the percentage excess of a sum of money contracted for forward delivery, e.g. a year hence, over what we may call the 'spot' or cash price of the sum thus contracted for forward delivery" (1973, p. 222). This change in the way money entered Keynes' analysis allowed an analogy with the *Tract's* "interest rate theorem" (see my 1982 article) to explain decisions to take positions in durables (including money) since every durable has spot and forward prices in terms of itself as numeraire giving its "commodity" or "own-rate of own interest": "just as there are differing commodity-rates of interest at any time, so also exchange dealers are familiar with the fact that the rate of interest is not even the same in terms of two different moneys..." (Keynes, 1973, p. 224).

In the exchange market, equilibrium is achieved when the forward discount or pre-

mium reaches equality with the interest differential. Just as the forward discount in the *Tract* measured the market's "preference" for holding that currency, Keynes now argued that the market's preference for holding money was also measured by the discount of future over spot money in terms of money: the rate of interest. Equilibrium was thus defined by the equalization of the relative advantages of taking positions in durable assets, that is, when all the own-rates evaluated in money were equal to the own-rate on money.

In this way Keynes gave expression to the way "changing views about the future are capable of influencing the quantity of employment and not merely its direction" (1973, p. vii), for every decision to purchase (invest in) a durable at prevailing spot prices depends on expectations of future conditions as expressed in future prices: the relation of spot to forward prices or supply and demand prices determines rates of return on investment in durable goods or their marginal efficiencies, while liquidity preference sets the spot and forward price of money, the rate of interest. Marginal efficiencies and liquidity preference thus reflect views of the future or the state of general expectation. The composition of asset holdings and overall expenditure decisions were thus directly influenced by changing views of the future. Since each individual had to reach his or her own view on the relation between present and future prices to determine the investment and expenditure strategy which maximized expected rates of return, decisions to buy investment goods or to hold money would be characterized by diversity of view as to expected rates. Equilibrium would be established when market prices for any activity produced a balance of divergent expectations. In such conditions, as Shackle has stressed, actual events may disappoint every agent's expectations, forcing frequent reconsideration of position and making decisions to invest liable to constant fluctuation. It was only possible to discuss equilibrium on the assumption of a given state of general expectation in which an increase in investment, or shifts between activities, eliminates discrepancies in own-rates evaluated in money

(marginal efficiencies) by means of adjustment in spot prices, current production (i.e., net investment), or the degree of liquidity, depending on the type of market and type of activity (see M. Tonveronachi, 1983, pp. 167–68).

Changes in expected future conditions thus influence divergences in marginal efficiencies which reflect differences between costs of production and prices which initiate expenditure decisions and affect both future supply and prices. Adjustment continues until marginal efficiencies and the money rate of interest are brought into equilibrium. Equilibrium could thus be represented in the aggregate in terms of effective demand equating aggregate supply price or on the individual level as uniformity of own-rates given by spot and forward prices of durables.

Further analysis of the nature of money and the behavior of liquidity preference was necessary to determine whether the equilibrium thus achieved was durable at less than full employment, for if money rates could be brought to a sufficiently low level to lead individuals to spend all of their income on current production, then full employment was the only stable position. Keynes suggested that since interest rates represented expectations of future rates, such a policy would only succeed if individuals could be convinced that reductions in money rates would not be reversed. His simple formula showing how capital loss offsets yield for smaller rises in interest the lower the prevailing rate (1973, p. 202) suggested that healthy skepticism (reinforced by the appearance of “semi-inflation” if money wages progressed more rapidly than productivity as expenditure increased) would lead rational investors to increase liquidity preference, causing the money rate to be the one to “decline most slowly as the stock of assets in general increases” (1973, p. 229), producing equilibrium (and confirming the skeptics’ opinions) before full employment is reached.

But orthodox theory had argued that even if increased hoarding reduced the demand for goods, this would only change the direction, not the amount, of employment if money were produced by labor. Keynes’ “essential properties of money” rather than the

liquidity trap are meant to meet this point; if the elasticities of production and substitution of money are negligible then the demand for money is not a demand for goods and money provides a “sink” for purchasing power.

#### IV. Own-Rates and Aggregate Supply and Demand

Discussion of a monetary economy characterized by money bearing these essential properties formed the introduction to early drafts of the *General Theory*, reflecting Keynes’ announcement of a “Monetary Theory of Production” in the Spiethoff *Festschrift*, but was to be replaced by the short-period equality of aggregate supply and demand price representing the principle of effective demand. Money appears as an integral part of the discussion of the determinants of investment, reflecting Keynes’ move towards the identification of investment as the *causa causans* in determining output and employment; while money loses pride of place, it gained in importance, providing the very basis for the explanation of the inherent instability of investment in a capitalist economy, and the explanation for persistent unemployment equilibrium by means of the “essential properties.” The final title announces a general theory in which “Employment” is determined by “Interest and Money.”

Thus the two influences from the value theory revolution provided parallel frameworks for presentation of Keynes’ revolution in monetary theory; the “Marshallian” analysis in terms of aggregate short-period supply and demand prices took on the more visible role in chapter 3, representing the changed role of money as the basic determinant of individual investment decisions determining asset prices reflecting liquidity preference, and explaining unemployment equilibrium.

Hicks was clearly more impressed by the aggregate supply and demand framework, but proposed his own Walrasian basis by aggregating a general equilibrium system into “bundles” representing three “market” equilibria in which equality of the natural and market rate of interest replaces that of “aggregate” supply and demand prices of the

principle of effective demand. This formulation placed money within the Walrasian framework and replaced Keynes' discussions of money and investment decisions with a constraint on the demand for money so as to produce a horizontal "Keynesian" range to the *LM* curve where a stable interest rate (the only price) also implied fixed wages and prices. Keynes vigorously denied such a relation and instead suggested that: "the difference between myself and the classicals lies in the fact that they regard the rate of interest as a non-monetary phenomenon" (1973b, p. 80). Keynes felt that his analysis of the effect of money and interest on investment had been overlooked because readers had placed undue emphasis on the difference between expected and actual demand. He repeats the point made to Hicks in a series of articles published in 1937, arguing that in his theory money was a "real" factor which could affect relative money prices and outputs in the long period as well as the short, while in difference to the theories of Wicksell and Hayek, the rate of interest was a purely monetary factor, independent of any real or natural forces:

Put shortly, the orthodox theory maintains that the forces which determine the common value of the marginal efficiency of various assets are independent of money, which has...no autonomous influence, and that prices move until the marginal efficiency of money, i.e., the rate of interest, falls into line with the common value of the marginal efficiency of other assets as determined by other forces. My theory, on the other hand maintains that this is a special case and that...the opposite is true, namely that the marginal efficiency of money is determined by forces partly appropriate to itself, and that prices move until the marginal efficiency of other assets fall into line with the rate of interest.

[1973b, p. 103]

## V. Extensions of the General Theory

Thus there were two possible lines of development: extension of the short-period

Marshallian (or Hicks' Walrasian) aggregate supply and demand framework to analyze factors such as capital accumulation, which were traditionally treated as "long period" problems, or analysis of a monetary economy where money is a determinant of the investment decision within the own-rate framework. Most economists, including Keynes' younger colleagues, pursued elaboration of long-period analysis and Kahn, Robinson, Kaldor, Harrod, among others, built on the aggregate version of Marshall's short-period to tackle the long-period problems of capital accumulation and distribution. Thus the Harrod-Domar growth models spawned multiplier-accelerator models, and the analysis of capital accumulation produced the Cambridge theories of aggregate income distribution. It is characteristic of these latter theories that investment is exogenous, eliminating the need to discuss the monetary elements which Keynes had used in the *General Theory* to explain investment decisions. While investment and expectations play a crucial role in the post-Keynes Cambridge theories, the fact that they were considered exogenous made analysis of the monetary factors Keynes considered crucial to their determination unnecessary. Of little importance to the formulation of short-period aggregate supply and demand, monetary factors and Keynes' concerns for cyclical instability had even less importance in the extension of these constructions to stable long-period equilibria.

For economists who preferred Hicks' Walrasian version, the analysis of long-period problems such as capital accumulation suggested flexibility of wages and prices, and variation in the rate of interest adjusting capital intensity to produce full employment. It was thus the aggregate supply and demand version of Keynes' theory, incorporated into traditional theory as a temporary general equilibrium with fixed prices, that failed transition to long-period conditions of flexible prices and production coefficients; the Cambridge objections to these formulations, made in Marshallian terms, had little impact. Indeed, in the Cambridge capital theory debates it was necessary to abandon Marshall and resort to Sraffa's theory of prices to

demonstrate the unlikely conditions required for the traditional results, but this left Keynes' theory still characterized by *ad hoc* short-period rigidity.

Joan Robinson, after a long career forging the long-period extension of the Marshallian short-period version of Keynes, finally rejected this approach in favor of the study of "historical" time, but has recently suggested (1978) that post-Keynesian analysis should be extended to reconcile Keynes and Sraffa. This would imply integrating Keynes' essential monetary relationships with Sraffa's. Keynes' extension of Sraffa's commodity rate analysis to a monetary economy was clearly an attempt to respond to Hayek by showing just exactly why money was not neutral. Just as Sraffa went on to develop a similar framework to specify the essential logical relations between distributive variables and relative prices, Keynes' extension of the interest rate parity theorem can be considered as the identification of the logical relations between the money rate of interest and the level of output and employment in a monetary economy. While Sraffa's relations imply no particular causal relationships, Keynes' system explicitly proposes money as the real or causal variable constraining a capitalist or monetary production system. It is the recognition of this role of money that has been absent from Cambridge, and all other, macroeconomics after Keynes.

Recently, there has been a renewal of interest in Keynes' monetary analysis. For example, Paul Davidson (1972) analyzes investment in terms of spot and future prices, drawing on the monetary detail of the *Treatise* to support liquidity preference, while Hyman Minsky (1975) has linked the role of aggregate expenditure to the determination of the relative prices of consumption goods and capital assets to identify the influence of the financial system on investment cycles. Luigi Pasinetti's (1981) discussion of the relation between natural rates and the social relations producing money rates of interest builds on similar factors. I (1982, 1983) and E. J. Nell (1983) attempt to draw direct links between the concepts of own-rates in Keynes and Sraffa.

From Hicks's reformulation of Keynes' supply and demand analysis in Walrasian terms to Don Patinkin's recent emphasis on its Marshallian origin, the profession (with the exception of D. Dillard, 1954, and more recently A. Barrère, 1985) has considered the principle of effective demand independently of Keynes' explicitly announced intention to analyze a monetary production economy and his claim that the distinctive aspect of his theory was to be found in the essential properties of interest and money which made the latter a real factor and the former a monetary factor. Recognition of this distinction as expressed in Keynes' own-rate framework may yet produce the monetary revolution in economic theory promised by Cambridge economics after Keynes.

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