Commodity Money, Say's Law, and Keynesian Economics

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Introduction

A central premise of Keynesian theory, the one above all others that distinguishes it from earlier theory, is that aggregate demand can be less than output. Although Malthus, Marx and a few other 19th century economists were modern in this sense, most classical writers considered such a situation impossible, even absurd.[1] The principle by which the classics rejected the possibility of insufficient aggregate demand is now known as "Say's Law." This principle or law had several defenses. One was that no one would save without at the same time investing or lending to others who wished to invest; no one would ever desire to add part of his saving to money balances.[2] Although this description of behaviour could be true for most people most of the time, it was and is nonetheless false; some people some of the time desire to add some of their increments of wealth to their stocks of money. Institutional arrangements, if nothing else, guarantee that this will be true; reserve requirements on saving deposits, for instance, prevent saving in that form from becoming available in its entirety to investors.

But Say's Law had an ultimate defense. There was a time when it would have seemed artificial to consider money anything but a commodity. And if money is a commodity, Say's Law is

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[1] "The doctrine [that there can be a supply of commodities in the aggregate surpassing the demand] appears to me to involve so much inconsistency in its very conception, that I feel considerable difficulty in giving any statement of it which shall be at once clear, and satisfactory to its supporters." John Stuart Mill, *Principles of Political Economy* (London: Longmans, Green and Co., Ltd., Ashley Edition, 1926), p. 557.

[2] There is not universal agreement that hoarding is essential to Keynesian economics. Mrs. Joan Robinson for one rejects the notion that hoarding has anything to do with the possibility of a gap between aggregate supply and demand and refers to "The 'Hoarding' Fallacy." "The question of how wealth is held, whether in money or securities, has only the slightest connection with the interaction of investment and saving." Joan Robinson, *Introduction to the Theory of Employment* (New York: The Macmillan Company, 1937), p. 15. In a recent text with John Eatwell, *An Introduction to Modern Economics* (Maidenhead: McGraw-Hill, 1973), a Keynesian-Kalecki model is developed without money. They write "... it is this divorce between saving and investing, or between getting income and spending, which gives rise to instability in effective demand. This does not mean that the problem is somehow to be blamed on the monetary system. A private-enterprise economy could not operate without money in some form or other but, as we shall see, it is private enterprise, not the money, which gives rise to instability." p. 97. Although Robinson and Eatwell derive many of the propositions we associate with Keynes, their model, lacking money, is Ricardian. It implies the propositions they attempt to refute. There are two sectors, corn and machines. Both goods are produced with fixed proportions of labor and machines. Labor gets a fixed proportion of output, institutionally determined, paid in corn. Capitalists are motivated by the desire to accumulate. Robinson and Eatwell assert that investment determines the production of corn, but this simply would not be the case. No corn-producing capitalist would fail to use his machines to the full; he always has the means to pay his workers, because they are paid a fraction of the output in the good produced. In their model, no one holds inventories, so the capitalists must offer the corn they save in exchange for machines. Although Robinson and Eatwell insist that investment determines profits, it is clear that profits determine investment. A reduction in wages would increase profits and thus increase the demand for machines, expanding production and employment in the machine sector if there are idle machines there. Thus, their model implies the very propositions they argue against, and it does so because it lacks money.

true.[3] If people save and do not lend to investors or invest themselves, in the usual sense of that term, then they intend to "invest" in money. When money is a commodity, people demand goods when they hoard just as truly as when they demand bread or machines.[4] The demand for money could exceed the supply, and when it did, the supply of other commodities taken together would exceed the demand for them, but it would be false to say that there was a deficiency of aggregate demand, since a reallocation of resources would have permitted a clearing of all markets without any decline in aggregate production.[5] (We shall explain presently why a reallocation of resources might not occur.)

Money has been undergoing constant evolution, and today virtually no one thinks of it as a commodity at all. Governments everywhere have taken over its management and replaced it with fiat money, and commercial banking has further reduced fiat money to a fraction of the total stock. Under modern circumstances a deficiency of aggregate demand is possible when, given a fixed stock of money, people wish to add to their money holdings. No arrangement of resources by the private sector could eliminate the deficiency, since private firms are not permitted to supply that which is demanded.

Although money is not now a commodity or ever likely again to be one, barring a catastrophic international crisis or adoption of one of the proposals for a commodity-reserve currency, an examination of the implications of it being a commodity can nonetheless be instructive.[6] We gain not only a greater appreciation

[3] Subject to the qualification that the security market equilibrates. Even in a barter economy there could be an excess supply of goods, if there were at the same time an excess demand for bonds. In this paper we shall make the usual assumption that the security market equilibrates.

[4] There is confusion in Marx on this point. "To Marx, J. B. Say was variously 'inane,' 'miserable,' 'thoughtless,' 'dull,' 'comical,' and a 'humbug.' The doctrine he represented was 'preposterous,' 'a paltry evasion,' 'childish babble' and 'pitiful claptrap.'" Thomas Sowell, *Say's Law* (Princeton: Princeton University Press, 1972), pp. 180–81. Marx rejected Say's Law because a person is not bound to purchase because he has just sold. At the same time, Marx treated gold production as sales without purchases. Thus, if people wished to hoard, there would be no deficiency of aggregate demand; all markets could be cleared if gold production equalled desired hoarding. Mrs. Joan Robinson, a critic of Say's Law and an admirer of Marx, failed to realize in her exposition of Marxian Analysis that Marx implicitly presented a proof of Say's Law. See: Joan Robinson, *An Essay on Marxian Economics*, 2nd ed. (New York: St. Martin's Press, 1966), pp. 44, 47, and 67.

[5] Although this point has been made often enough in the literature, it is neither widely known or accepted by the economics profession. Although Thomas Sowell, *ibid.*, quotes extensively from John Stuart Mill, he omits the following passage. "In order to render the argument for the impossibility of an excess of all commodities applicable to the case in which a circulating medium is employed, money must itself be considered a commodity. It must, undoubtedly, be admitted that there cannot be an excess of all commodities, and an excess of money at the same time." John Stuart Mill, *Essays on Some Unsettled Questions of Political Economy* (London: John W. Parker, 1844), p. 71. Some more recent, post-Keynesian statements can be found in: Jacques Rueff, "The Fallacies of Lord Keynes's General Theory," *Quarterly Journal of Economics*, LXI (May 1947), 343–67; Bela A. Balassa, "John Stuart Mill and the Law of Markets," *Quarterly Journal of Economics*, LXXIII (May 1959), 264; Thomas Mayer, "The Empirical Significance of the Real Balance Effect," *loc. cit.*, pp. 276–77; Arnold Collery, *National Income and Employment Analysis* (New York: John Wiley & Sons, Inc., 1966 and 1970), Chapters I and II; Robert A. Mundell, *Man and Economics* (New York: McGraw-Hill Book Company, 1968), pp. 108–110.

[6] Proposals for a commodity-reserve currency were made by Benjamin Graham and Frank D. Graham. See: Benjamin Graham, *Storage and Stability* (New York: McGraw-Hill Book Company, 1944); Frank D. Graham, *Social Goals and Economic Institutions* (Princeton: Princeton University Press, 1942), pp. 94–119. See also Milton Friedman's critique: "Commodity-Reserve Currency," *Journal of Political Economy*, LIX (June 1951), pp. 203–32, reprinted in *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), pp. 204–50. Recently Professors Hart,

of some parts of classical analysis, but in addition we understand modern monetary and income analysis better by having one more thing with which to compare and contrast it.

In this paper we shall present a familiar model that contains supply-and-demand functions for money and commodities and implicitly a supply-and-demand function for securities. It will contain one novel assumption: part of the output will be added to the stock of money. We shall be concerned with an economy that operates at full employment and one that operates with a rigid money wage and unemployment. In addition, we shall consider the case of complete mobility of capital between sectors and then the case of complete capital immobility. What we achieve is a new analysis that introduces a special and historically interesting assumption about money into *L-M* and *I-S* analysis. In the last section of the paper we shall examine a model in which money wages are rigid and capital is immobile. We shall conclude that, even though Say's Law is true, the monetary and fiscal policy implications of Keynesian theory are unaltered. But we shall show that Keynes's analysis of the effect of wage reductions must be modified.

The Equations

For a closed economy in which money is a commodity, there exists the following relation:

$$I_W + G_W + M_W = S_W + T_W,$$

where I is investment, G is government expenditures, M is the output of the money commodity, S is saving, and T is taxes. All variables are expressed in wage units, W being the symbol for the money wage rate.

With G_W and T_W exogenously determined, the three endogenous variables are: I_W, S_W, and M_W. Saving varies with disposable income, Y_W minus T_W, and investment varies inversely with the rate of interest, r. We, therefore, have the following equilibrium condition, where Y_W is output in wage units:

$$I_W(r) + G_W + M_W = S_W(Y_W - T_W) + T_W. \quad (1)$$

$I_W(r)$ and $S_W(Y_W - T_W)$ are the investment and saving functions.

The demand for money in wage units, M_W^D, a demand for a stock, depends on Y_W and r. In equilibrium it must equal the supply of money, a multiple, g, times all past production of the money commodity valued in wage units, $(P^M/W)M_0$, plus the current production of the money commodity in wage units, M_W. P^M is the price of the money commodity in terms of the unit of account, say the dollar; it is fixed by the government and will, therefore, be treated as a parameter.[7] M_0 is the physical quantity of the money commodity in existence at the beginning of the period. To simplify, we assume that the money commodity has no other use, so that a decrease in its value could not lead to its consumption. Setting demand equal to supply, we have

$$M_W^D(Y_W, r) = g\left[\left(\frac{P^M}{W}\right)M_0 + M_W\right]. \quad (2)$$

Equations (1) and (2) contain at least three variables, whether the system operates at full or less than full employment. With full employment, Y_W could be constant, but then W, r, and M_W would be endogenous. With unemployment based on a rigid money wage, W would be given, but Y_W, r, and M_W would be endogenous. We are at least one equation short to determine r, M_W, and W in the full employment case and r, M_W, and Y_W in the unemployment case. We must consider supply conditions.[8]

The current output of the money good in wage units, M_W, equals the value of output of the money good, P^M times M, divided by the wage rate, W, where M is the quantity of the money good produced. Therefore,

$$M_W = \left(\frac{P^M}{W}\right)M. \quad (3)$$

To avoid the necessity of dealing with many relative prices, we assume that there are only two distinct goods produced, the money commodity and everything else. Government, consumption, and investment demands are, therefore, all satisfied by the same good. The quantity of that good produced is X and its price is P. Total output is the sum of the output of the two goods.

$$Y_W = \left(\frac{P}{W}\right)X + \left(\frac{P^M}{W}\right)M = \left(\frac{P}{W}\right)X + M_W. \quad (4)$$

The output of each good is a linear-homogenous function of the quantities of labor and capital employed in its production. Letting ℓ_M be the ratio of labor to capital and K_M the quantity of capital used to produce the money good, we have

$$M = K_M f(\ell_M). \quad (5)$$

The marginal products of labor and capital in producing the money commodity, the partial derivatives of Equation (5), equal the real wage and the real rent of capital, W/P^M and R/P^M, where R is the rent of a unit of capital. Therefore, we have

$$f'(\ell_M) = \frac{W}{P^M} \quad (6)$$

and

$$f(\ell_M) - f'(\ell_M)\,\ell_M = \frac{R}{P^M}. \quad (7)$$

There are three similar equations for the non-money good. They are

$$X = (K - K_M)\,\phi(\ell_X), \quad (8)$$

$$\phi'(\ell_X) = \frac{W}{P}, \quad (9)$$

and

$$\phi(\ell_X) - \phi'(\ell_X)\,\ell_X = \frac{R}{P}, \quad (10)$$

where K is the existing stock of capital, which in equilibrium is always in use and ℓ_X is the proportion of labor to capital used to produce the non-money good.

Finally, we know that the quantity of labor used to produce the money good plus the quantity used to produce the non-money good equals employment, L. Therefore,

$$\ell_X K + (\ell_M - \ell_X)K_M = L. \quad (11)$$

Full Employment with Mobile Capital

If the quantity of labor in use, L, equals the total supply offered, Equations (1) through (11) describe a fully-employed economy. The eleven equations imply an equilibrium solution for eleven endogenous variables: M_W, r, Y_W, $W, P, X, M, K_M, \ell_M, R$, and ℓ_X. The exogenous variables are: G_W, T_W, g, P^M, M_0, K, and L.

Without making further assumptions, it is not possible to reduce this system of eleven equations to two independent equations in two unknowns, for the demand and supply of money and the demand and supply of goods are interdependent. There is a special case in which things work out quite simply, however. Assume that the factor proportions are the same in both sectors: ℓ_X equals ℓ_M. If the factor proportions are the same then they must equal L/K, both of which are known. Since P^M is an exogenous

Kaldor, and Tinbergen revived the proposal. See: Albert G. Hart, Nickolas Kaldor, and Jan Tinbergen, "The Case for an International Commodity Reserve Currency" (United Nations Conference on Trade and Development, E/Conf. 46/P/7, 17 February 1964). Harry G. Johnson examined their proposal in his *Economic Policies Toward Less Developed Countries* (London: George Allen & Unwin, Ltd., 1967), pp. 229-36.

[7]If there is no established unit of account, P^M is equal to one. All prices are then relative prices.

[8]In *I-S* and *L-M* analysis, M_W would not appear, so the two equations would yield a solution for r and W in the full employment case and r and Y_W in the unemployment case.

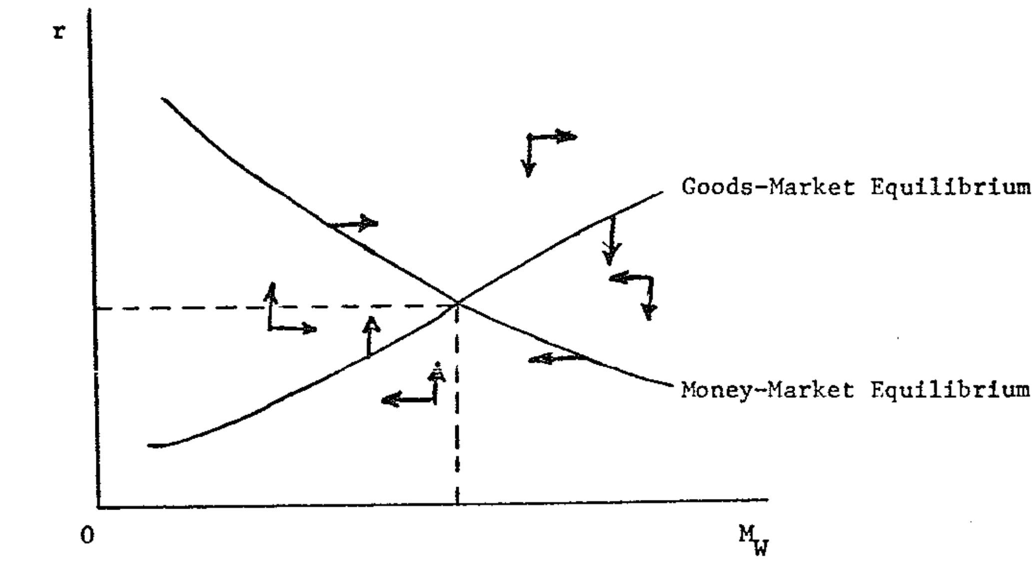

Figure 1

variable, the money wage rate is determined by Equation (6), once ℓ_X is set equal to L/K. Since ℓ_X and W are known, Equation (9) determines P, the price of the non-money good. In other words, with the price of money fixed by the government, the money wage rate and the price of the non-money good are determined directly from the production functions, in this special case of equal factor proportions.

What about Y_W? Since W/P and W/P^M are determined from the production functions, Y_W, as given by Equation (4), varies only with X and M, the composition of output. With P/W and P^M/W given, the total differential of Equation (4) is $dY_W = (P/W)\,dX + (P^M/W)\,dM$, which can be rewritten as $[(P/P^M)\,dX/dM + 1]\,(P^M/W)\,dM$. It is implicit in Equations (5) through (11) that dX/dM equals $(-P^M/P)$.[9] Therefore, dY_W is equal to zero, and Y_W is also determined from the production functions and is independent of the composition of output.

With Y_W and W determined from the production conditions, Equations (1) and (2) are sufficient to determine the rate of interest, r, and the output of the money good expressed in wage units, M_W.

In Figure 1 the positively-sloped function, which is labeled goods-market equilibrium, is a graphic depiction of Equation (1). According to that equation, if r were to increase, investment would fall and, given G_W, T_W, and Y_W, equilibrium would necessitate an increase in M_W; the function is, therefore, positively sloped. The negatively-sloped function, which is labeled money-market equilibrium, is a graphic depiction of Equation (2). According to that equation, if r were to rise, given P_M, W, M_0, and Y_W, the demand for money would fall and equilibrium would require a reduction in the supply of money; M_W would decrease. The equilibrium values of r and M_W can be found at the intersection of the money-market and goods-market equilibrium lines.

[9] dX/dM is the slope of the implicit production-possibility function. Under competitive conditions, it will equal the negative of the ratio of prices in equilibrium.

An increase in G_W or a reduction in T_W would cause the goods-market equilibrium line to shift to the left, raising the rate of interest and reducing the production of money. If, for example, G_W increased, given Y_W and T_W unchanged, either I_W or M_W would have to decrease. If r were to be unchanged, then I_W would be unchanged and the value of M_W corresponding to each value of r would be less; the function would shift to the left, raising r and lowering M_W in equilibrium. Since prices were determined without reference to Equations (1) and (2), they are independent of the composition of output and the rate of interest and would be unaffected by these fiscal actions.[10]

Consider now an increase in the money stock. The monetary authorities could create more money by raising g, the ratio of the total money stock to commodity money. This change could be affected by open-market purchases of bonds, increased discounting, or a lowered reserve requirement. An increase in g causes the money-market equilibrium curve to shift to the left. For with Y_W given, the demand for money in wage units after the increase in g would be the same at each rate of interest as it was before. Therefore, at each rate of interest the real supply of money must be the same, which can only be so if M_W falls. So, corresponding to each rate of interest, M_W would be less. A shift of the money-market equilibrium line to the left in Figure 1 lowers the rate of interest and the production of money in wage units. Since the rate of interest would fall, it would be at least in part a monetary phenomenon. In spite of the change in the money stock and the production of money, prices would again be unaffected, since they depend only on production conditions, given the price of money itself unchanged; the quantity theory of money would have no applicability in this full-employment model for changes in the money stock brought about in the manner specified.

There is, however, another way the money supply could be increased: the price of money could be raised. An increase in the price of the money commodity, P^M, would raise all prices in proportion, since with ℓ_M given, Equation (6) implies that W is proportional to P^M, and Equation (9) that P is proportional to W. Since P^M/W and Y_W would be unchanged, the money-market and goods-market equilibrium lines would be unaffected by a change in P^M, given g constant; the rate of interest and the composition of output would not depend on the price of money. Therefore, a change in the price of money with a proportional change in the nominal stock of money leaves the real stock of money unaffected in equilibrium. The quantity theory of money only holds then for increases in the money stock brought about by a change in its price.

The reader is again reminded that this analysis assumes identical factor proportions in the two sectors. If factor proportions differed, changes in demand would alter not only the composition of output, but factor returns and the price of the non-money good as well. An increase in g, for example, causes M_W to fall. Resources would be reallocated away from the production of money to the production of investment goods. Now if factor proportions differed, the movement of resources between the two sectors could not occur without a change in the proportions. In the new equilibrium, real wages, whether measured in terms of the money commodity or the non-money commodity, would be greater if the non-money sector were relatively labor intensive and less if it were relatively capital intensive. P, the price of the non-money good, would rise as more of it was produced. Changes in taxes and government spending would also alter real wages and the price of the non-money good.

Although we have assumed the supply of

[10] Milton Friedman has made essentially the same point. See: Milton Friedman, *The Optimum Quantity of Money and Other Essays* (London: Macmillan and Company, Ltd., 1969), p. 20.

labor to be given, one might prefer to assume that it varies with the real wage. In that case, changes in monetary or fiscal policy would alter employment when factor proportions differed. An increase in G_W, for example, would cause resources to move out of the money sector and enter the non-money sector, altering the real wage. If the supply of labor were positively related to the real wage, output and employment would rise if the non-money sector were relatively labor intensive and fall if relatively capital intensive.

Before considering the rigid-wage case, there is one more point worth making. Our analysis assumes the validity of the neo-classical theory of income distribution. For those who reject that theory, it may be useful to point out that essentially the same conclusions can be obtained without assuming anything explicitly about capital and income distribution. If we deflate money variables by the price of the non-money good rather than by the wage rate, we could consider the following system of five equations in five endogenous variables, where the fourth equation is a production-possibility function.

$$I_P(r) + G_P + \left(\frac{P^M}{P}\right)M = S_P(Y_P - T_P) + T_P$$

$$M_P^D(Y_P, r) = g\left[\left(\frac{P^M}{P}\right)M_0 + \left(\frac{P^M}{P}\right)M\right]$$

$$Y_P = X + \left(\frac{P^M}{P}\right)M$$

$$X = f(M)$$

$$f'(M) = -\left(\frac{P^M}{P}\right).$$

Except for our remarks about real wages, all previous results could be obtained from this alternative model. If, for example, $f'(M)$ were assumed constant, then the same results follow as in the case in which we assumed equal factor proportions.

Unemployment with Mobile Capital

By assuming that W is a parameter and L a variable, reversing their roles, the model of a fully-employed economy becomes one with unemployment. The system of eleven equations then implies an equilibrium solution for the following eleven endogenous variables: r, M_W, Y_W, P, S, M, K_M, ℓ_M, R, ℓ_X, and L. The exogenous variables are G_W, T_W, g, K, P^M, and W.

Since both W and P^M are exogenously determined, Equation (6) determines ℓ_M, the factor proportions in the industry producing the money good. If we again begin by considering the special case in which factor proportions are the same in both sectors, then Equation (11) determines employment; employment is equal to the capital stock multiplied by the labor-capital ratio in both sectors as determined by W/P^M. With L known, Equations (5) through (11) again determine Y_W, which, therefore, is independent of the composition of demand. With Y_W determined and G_W, T_W, P^M, W, and M_0 exogenous, Equations (1) and (2) again determine r and M_W. Therefore, the analysis we developed for the full-employment case, using Figure 1, applies equally well to this case of unemployment. An increase in government spending or a reduction in taxes alters the composition of output and changes the rate of interest, but has no effect on the other variables, including employment. Similarly, an increase in the money supply, brought about by the monetary authorities increasing g, would reduce the rate of interest and the production of money, replacing it with investment, but employment would be unchanged.

Although employment would be independent of G_W, T_W, and g, there are two parameters on which it would depend. They are P^M and W. Even though no wealth effect on saving has

been introduced into the analysis and even if the demand for money were infinitely elastic at the existing rate of interest, an increase in P^M or a reduction in W would raise the level of employment. Consider Equation (6). If W/P^M fell, by either W falling or P^M rising, the marginal product of labor would fall. Since this could only occur if ℓ_M rose, with factor proportions the same in both sectors, we see from Equation (11) that L would rise. A reduction in the money wage (or an increase in the established price of the money commodity) would expand employment, for a reduction in the money wage would entail a reduction in a "real" wage.

What if factor proportions differed? If factor proportions differed, then employment would depend on demand conditions, and shifts in the goods-market and money-market equilibrium curves would alter employment. A decrease in T_W or an increase in either G_W or g would lead to an expansion in the production of the non-money good and a higher rent on capital. The higher rent on capital would reduce the production of the money commodity, given its fixed price. M_W would fall. Resources would move out of the industry producing the money good and enter the other sector. Consider Equation (11). If K_M fell because of a reduction in the production of money and if the factor proportions were unequal, employment would increase if ℓ_X exceeded ℓ_M and would decrease if the reverse were true. With factor proportions initially unchanged, the money-good sector releases factors in the proportion in which it uses them. If it is less capital intensive than the non-money good, the absorption of the released capital in that industry would require more labor than the money industry has discharged; employment would increase. If the money industry releases more labor relative to capital than the non-money industry uses, the full employment of the capital stock would entail a reduction in the use of labor. Fiscal and monetary policy, therefore, might have the consequences expected of them, but the results could also be perverse.

Full Employment and Immobile Capital

In the short period it may be more plausible to assume that capital is immobile between sectors. Let us, therefore, assume that K_M and K_X are constant. We lose one variable, since K_M would now be exogenously determined, but we gain one variable, since there would be two different rents for capital, R_M and R_X, which need not be equal. Under these circumstances, Y_W would depend on the composition of output. It would be impossible, therefore, to solve for any of the variables in the eleven equations without solving for the others. Certain generalizations can nonetheless be made.

Relative factor prices are determined in part by demand conditions. Changes in the goods and money markets would alter the composition of output and cause labor to move from one sector to the other. A reduction in T_W or an increase in either G_W or g would reduce the production of the money good and raise the production of the non-money good. The exit of labor from the money industry would raise the marginal product of labor there; W/P^M would rise. Since P^M is unchanged, W would rise. The higher wage rate on top of a higher rent for the scarce capital in the non-money sector implies an increase in P. Since the marginal product of labor would fall in the non-money sector, P would rise more than W, and in this sense the real wage would fall. The changes in relative factor returns and the composition of output could alter Y_W and, through repercussions in the money and goods markets, moderate or reinforce the original disturbance.

Unemployment and Immobile Capital

Since P^M and W are both given in the unemployment case, we can find employment in the money sector directly from Equation (6), when K_M is also assumed given. With ℓ_M determined,

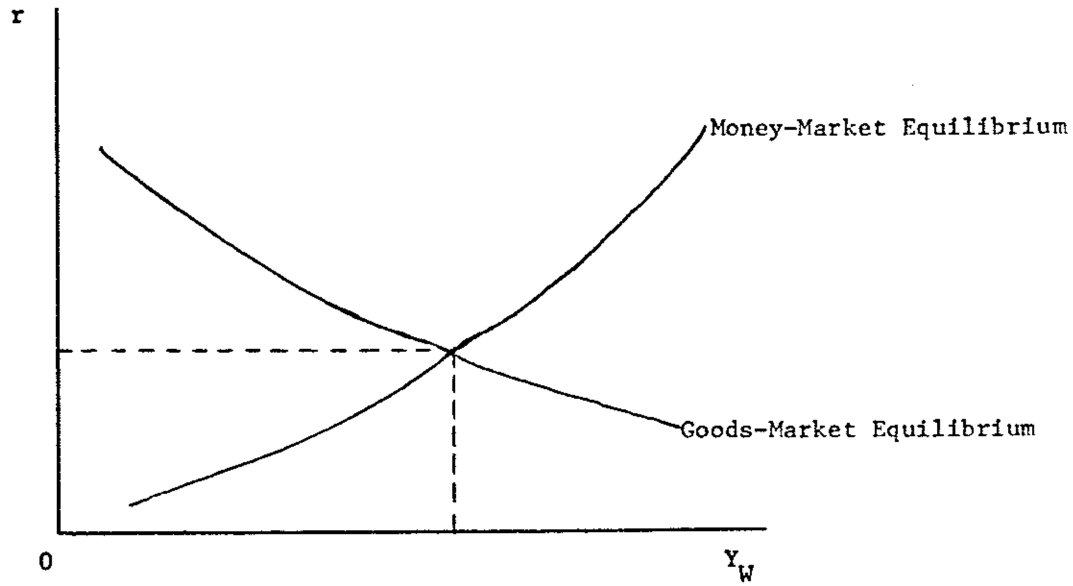

Figure 2

and K_M given, M is determined by Equation (5). But if P^M/W and M are known, then we can assume in Equations (1) and (2) that M_W is known. Equations (1) and (2) can then be solved for r and Y_W. The goods-market and money-market equilibrium lines in Figure 2 are the familiar I-S and L-M curves.

All the usual results of the familiar income-expenditure model concerning monetary and fiscal policy in an economy with unemployment can be derived with the aid of Figure 2. An increase in government spending, a reduction in taxes, or an increase in the money stock through an increase in g would raise output and employment. With P^M, W, and K_M all given, the production of the money commodity is fixed. Changes in the composition of demand, therefore, without any change in aggregate demand could alter output. If the demand for the non-money good fell and the demand for the money good rose, output would fall even though aggregate demand was unchanged. For an increase in the demand for money would have no effect on the production of the money commodity, given P^M/W, while a simultaneous contraction in the demand for the non-money good would reduce its output. As a consequence, a reduction in consumption, government or investment demand would lower output and employment, even though Say's Law were true. It is not a deficiency of aggregate demand that causes unemployment in the above instance, it is a change in its composition, given rigidity in the production of the money good.

The model does contain one unfamiliar result, however. Consider an increase in P^M/W brought about either by a reduction in W or an increase in P^M According to Equation (6), ℓ_X would increase and so would M_W. Consider the money-market equilibrium curve in Figure 2, which was based on the assumption that M_W and P^M/W were constant. If g is not changed, the increase in P^M/W raises the value of the money stock as measured in wage units, causing the money-market equilibrium curve to shift to the right. The increase in M_W, the current output of the money industry in wage units, also causes the curve to shift to the right. If the

money-market equilibrium curve were horizontal at the existing rate of interest this might have no effect on Y_W and L, but we have also to consider the goods-market equilibrium line. Consider Equation (1). An increase in M_W, given r, increases the left side of the equation. If equilibrium is to exist in the goods market, the right side must increase by the same amount; only an increase in income in inverse proportion to the marginal propensity to save would achieve this result. Therefore, corresponding to each rate of interest, Y_W would increase by the increase in M_W divided by the marginal propensity to save. A reduction in the money wage would, therefore, raise output and employment, as would an increase in the price of money. Notice that this result does not depend on a wealth effect on saving, for we have not assumed that the reduction in the wage rate decreases saving at each income level.

Keynes, in his *General Theory,* assumed explicitly that the production of gold was perfectly inelastic, and he therefore ignored the effect of wage reduction on M_W.[11] But even if Keynes's assumptions were granted, which I think few would grant, and the employment of labor and capital were unchangeable in the money sector, so that M were constant in the short run, a reduction in the wage rate would increase M_W. In Keynes's analysis, therefore, flexible wages and unemployment equilibrium are incompatible even in the absence of a Pigou effect or even if the Pigou effect is transitory. Those who believe that a *laissez-faire* economy may not offer full employment in equilibrium may be able to find support for this view in what Keynes said, but cannot find such support in Keynes's *General Theory.*

We shall end by considering a possible objection to this last point. Although the result is independent of the units in which output is measured, it might be thought sensitive to our assumption that the money good is not consumed. If the money good were also a consumption good, a reduction in wages with a proportional reduction in the price of the non-money good would raise the real income of the producers of the money good, but might lower perceived real income of others who consume the money good, since its relative price would have increased. If this were true, then an initial reduction in wages might have no effect on the output of the non-money good, because the increase in demand by one group would be offset by a reduction in demand by those who sensed a reduction in real income when the relative price of the money good increased. But if wages were flexible downward, they would continue to fall and the relative value of the money commodity would continue to increase. If the money good were a normal good—if the quantity consumed decreased as its value increased—a point would be reached at which the money good would become such a small part of consumption, eventually zero, that further increases in its relative value would make no one feel worse off.

[11] John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan and Company, Ltd., 1936), pp. 234–5.