

Keynesian and Classical Models Compared and Evaluated

Chapter XV

A COMPARISON OF FORMAL MODELS

To begin this comparison of Keynesian and Classical macroeconomic models, let us retrace very briefly the steps through which we developed our Classical model, in Chapters V through VIII.

We started with the simple idea of the "quantity theory," expressed symbolically as

$$(1) \quad M = lPy$$

This idea, that money is held only so long as necessary to bridge the necessary time-gap between transactions, and then moves along against goods, provides not only a theory of the price level, but necessarily incorporates, as well, a simple explanation for the volume of output (and by implication) employment. If prices (P) are flexible, then they will always rest at the level which permits output (y) to be at the maximum level permitted by resource supplies and technology. Only with this assumption is it possible to explain why prices (in the short run) vary proportionately with the supply of money.

This theory might do well enough in an economy where each man produces what he sells and sells what he produces. But if labor is hired by a specialized agent, an entrepreneur, we need to expand this simple analysis by recognizing that employment decisions depend on the relationship between two kinds of price levels—the price level of goods and the price level of labor (the money wage). To have an employment theory, therefore, we added the equation, already implicit,

$$(2) \quad y = y(N) \quad (\text{the production function})$$

together with

$$(3) \quad \frac{dy}{dN} = \frac{W}{P} \quad (\text{the condition for profit maximization})$$

and

$$(4) \quad N = N\left(\frac{W}{P}\right) \quad (\text{the supply of labor function})$$

Equilibrium in the labor market requires equality between the supply and demand for labor (a real wage equal to the marginal supply price of labor and as well to the marginal product of labor). Equilibrium in the market for goods requires equality between the supply and demand for goods (a price level at which the entire output can be sold which it is profitable to produce, given the state of technique and the wage level). These conditions of equilibrium are added to the first one—that equilibrium in the public's money holdings requires equality between the supply and demand for money (a price level for the goods exchanged just high enough so that there are no idle balances).

Since the theory that all money which is received automatically gets spent does not square with the fact that many people save who do not themselves invest, we added the notion that the market rate of interest fluctuates to keep investment spending equal to the nonspending of income by consumers. For the rate of interest to perform in this way it was necessary to revise the interpretation of equation (1) to imply only that wealth holders always prefer to hold earning assets rather than barren cash, and to round out the system with:

$$(5) \quad s = s(r)$$

$$(6) \quad i = i(r)$$

$$(7) \quad s = i$$

The resulting model had certain properties of which the following summary will remind us: (a) the only equilibrium is with full employment; (b) changes in M can influence only the price level, not the rate of interest, the real wage, nor the levels of output and employment; (c) only in the disequilibrium process, as explained by Wicksell, is there any tie between the rate of interest and the rest of the model; but this explanation is necessary to make good sense out of the theory of prices and for us to understand how the banking system fits into the picture; (d) if

money wages are rigid at too high a level, or fail to fall fast enough, full employment is impossible; but the theory is not clear whether the result would be a continuously falling employment and output level, or some quasi-equilibrium at less than full employment, and, if the latter, at how much less.

From the standpoint of subsequent students of economics, it was in some ways unfortunate that Keynes did not see how he could graft his ideas on to this Classical model, but felt that he had to reject it, and to start over again. It should be recorded that he tried the older approach. This two-volume *Treatise on Money* (published in 1930) was a long and painstaking development along the lines pioneered by Wicksell and others in the Classical tradition. But Keynes ended his work on the *Treatise* deeply dissatisfied. He wrote, in the preface:

This book . . . has occupied me for several years, . . . during which my ideas have been developing and changing. . . . The result is, I am afraid, that there is a good deal . . . which represents the process of getting rid of the ideas which I used to have. . . . I feel like someone who has been forcing his way through a confused jungle. Now that I have emerged from it, I see that I might have taken a more direct route. . . .

Five years later, his new approach appeared, his *General Theory of Employment, Interest and Money*. In this he attacked the Classical theory as unrealistic in its assumptions and incorrect in its logic. Rather than to modify and correct it, he started over again, developing his own theory in about the order in which we have done, in Chapter X, XIII, and XIV. That is, he started with the idea of a consumption function, and the recognition that total income was derived from (and, on simple assumptions, equaled) total spending for consumption and investment:

$$(I) \quad c = c(y)$$

$$(II) \quad y = c + i$$

$$(III) \quad i = i_0$$

As we have seen, (I) and (II) can equally well be rewritten:

$$(Ia) \quad s = s(y)$$

$$(IIa) \quad s = i$$

From this model derive the multiplier, and the basic Keynesian fiscal policy conclusions. We found that we could substitute for (III)

$$(IIIa) \quad i = i(y)$$

without making any real difference, so long as the modified stability condition was observed.

But Keynes was too good a Classical economist really to assume investment autonomous (or dependent only on income); rather, he accepted (with certain qualifications that we shall refer to in a moment) the Classical idea that investment depends on the rate of interest:

$$(IIIb) \quad i = i(r)$$

or, combined with the notion embodied in (IIIa),

$$(IIIc) \quad i = i(r, y)$$

His principal qualifications were, one, that the investment schedule was relatively steep: even at zero r , investment would be at a finite rate, not necessarily sufficiently high for full employment; and, two, that the position of the investment schedule was highly unstable (he emphasized psychological reasons for its instability) and subject to wide swings that (for purposes of his formal theory) must be considered autonomous.

These latter qualifications play an important role; nevertheless the admitted dependence of i on r made the model incomplete without a theory of the interest rate. It had to be a theory other than the Classical one, or the rate of interest would admit by the back door the Classical doctrines of automatic stabilization of aggregate demand. In his interest theory he embodied ideas which derived from his own earlier work and which had been at least partially foreshadowed in Wicksell's disequilibrium analysis. (By stating his theory in stock rather than flow form, however, he failed himself fully to see the exact nature of his innovation, nor could many subsequent economists—even down to the present—see through his novelty of form of statement to appreciate both its link with the past and the nature of its substantive innovation.) Thus we have:

$$(IVa) \quad M = M_t + M_s$$

$$(IVb) \quad M_t = lPy$$

$$(IVc) \quad M_s = L(r)$$

or simply

$$(IV) \quad M = lPy + L(r)$$

So long as prices are assumed as rigid, and no account is taken of the necessity for employers to find a profit margin between the wage and price level, equations (I), (II), (IIIb), and (IV) define a "complete" model, in the sense that there are as many equations as unknowns.

But Keynes was also too good a Classical economist to assume away the price and profit mechanism. Thus we add

$$(V) \quad y = y(N)$$

$$(VI) \quad \frac{dy}{dN} = \frac{W}{P}$$

Realizing that addition of the Classical supply of labor function would imply a full-employment solution, and believing that in any case money wages are not flexible, Keynes substituted an autonomously determined money wage

$$(VII) \quad W = W_0$$

In his verbal discussion, he admitted some departure from the assumption of a completely rigid money wage, as already indicated.

Keynes did not reject the logic of the Classical supply of labor schedule

$$(4) \quad N = N\left(\frac{W}{P}\right);$$

in fact he retained it to define the position of full employment. But he argued that this equation could not always be fulfilled simultaneously with the others—i.e., that equilibrium at less than full employment is possible.

It should not be difficult to see that the two models, Keynesian and Classical, overlap considerably. Bringing them together for purposes of comparison (with the order rearranged in the Keynesian model) we have

	Classical		Keynesian
(1)	$M = lPy$	(IV)	$M = lPy + L(r)$
(2)	$y = y(N)$	(V)	$y = y(N)$
(3)	$\frac{dy}{dN} = \frac{W}{P}$	(VI)	$\frac{dy}{dN} = \frac{W}{P}$
(4)	$N = N\left(\frac{W}{P}\right)$	(VII)	$W = W_0$
(5)	$s = s(r)$	(Ia)	$s = s(y)$
(6)	$i = i(r)$	(IIIb)	$i = i(r)$
(7)	$s = i$	(IIa)	$s = i$

The differences that show up on the surface are only three:

- a) Keynes added the speculative demand for money to the Classical transactions demand [equation (1) versus (IV)].
- b) Keynes suppressed the supply of labor function and assumed rigid wages; [(4) versus (VII)].
- c) Keynes assumed saving (consumption) to depend on income rather than upon the interest rate [(5) versus (Ia)].

Which of these constitutes the really crucial difference between Classical and Keynesian analyses? Some economists have said that it is the first of these differences, others that it is the second, others the third, while still others say it is none of these but something else that does not show up directly in this formal structure.

To show that the crucial difference is not the consumption (saving) function, some economists correctly point out that, if the only modification in the Classical model were the substitution of (Ia) for (5), the conclusions of the Classical model would hardly be altered at all. This can be seen by recognizing that (2), (3), and (4) still define a full-employment equilibrium of y , N , and W/P . Adding equation (1) solves for the absolute price and wage level. With y already determined, then, by (Ia), so is s . Given s and equations (6) and (7), r and i are determined. If M is changed, only prices and wages are altered. If the s or i schedules shift, only r will be altered. The only difference is that, now, a shift in either the production function or the supply of labor will alter the rate of interest, because, by altering y , they will change the level of saving relative to investment. But this is a minor difference, of little importance for short-run economic policy, because the aggregate production function and labor supply change only slowly and steadily.

Others go on to argue that the speculative demand for money is not very important because we can add this, too, to the Classical model without changing its basic conclusions (this is true whether we add this alone or with the consumption function as well). We saw in Chapter IX that the speculative demand schedule did not necessarily spoil the Classical full-employment equilibrium. We saw in Chapter XIV that if we insert flexible wages [i.e., equation (4)] into the Keynesian model, we may still find an equilibrium at full employment. Ignoring many necessary qualifications (contained in the analyses referred to in the two previous sentences), one can then go on to argue that the really crucial Keynesian innovation was the introduction of rigid wages. Only if rigid wages are assumed can there be any "equilibrium" at less than full employment. Since Keynes' principal claim was to have demonstrated this possibility,

it is clear that wage rigidity is his crucial assumption. This, some critics add, is nothing very original; for even the Classical economists fully recognized that rigid wages would cause unemployment; in fact it was the only possible cause of unemployment. It is merely that Keynes was the first to write a whole book about the special case in which wages are rigid.

Keynes himself anticipated this criticism, and went to great pains to argue that his conclusions did not depend on the assumption of rigid wages. Many (perhaps most) later Keynesians have agreed with Keynes' own apparent judgment that the really crucial cause of unemployment was the speculative demand for money.¹ It was this which prevented the interest rate from stabilizing aggregate demand, thus throwing an insupportable burden upon wage and price flexibility, which were actually far from perfect anyway. Further, if the speculative demand schedule were very elastic, almost no amount of deflation would work. Rigid wages are thus not the *cause* of unemployment; they merely prevent unemployment from creating a painful, largely useless, even bottomless deflation.

Another view argues that neither the consumption function, liquidity preference, nor rigid wages is the really crucial Keynesian innovation. Suppose that we accept the Classical model in full, except to specify that, at least at times, there may be an inconsistency between saving and investment; that is, equations (5), (6), and (7) may have no solution at a positive rate of interest. This can occur if the interest elasticity of saving is slight—and Keynes argued that saving depended primarily on y and only secondarily, if at all, on r —and if the interest elasticity of investment is also limited, and this was also something Keynes stressed. If such an inconsistency exists, wages and prices would fall without limit, unless wages are sticky. If such an inconsistency exists, the rate of interest would fall toward zero, except to the extent that the speculative demand for money would cushion its fall. But wage rigidity and the speculative demand are mere details. The fundamental cause of unemployment lies in the insufficiency of investment relative to saving, and the inability (quite apart from speculation) of the interest rate to do much about it. In this view, then, the fundamental Keynesian ideas are contained in the simple three-equation model; the rest is mere window dressing. The

¹ "Men are unemployed . . . because people want the moon;—men cannot be employed when the object of desire (i.e., money) is something which cannot be produced and the demand for which cannot be readily choked off. There is no remedy but to persuade the public that green cheese is practically the same thing and to have a green cheese factory (i.e., a central bank) under public control." (*General Theory*, p. 235.)

simple model ignores the interest rate, but the interest rate is not very important anyway.

We do not have to choose one among these competing views as correct, rejecting the others. They are matters of emphasis, and of degree.

One striking fact, however, emerges. Whether we emphasize that unemployment is caused by wage rigidity, by speculation, or by inconsistency, the primary determinant of the *extent* of unemployment, and therefore of the level of national income and output, is the slope of the consumption function. For if neither the interest rate nor the wage and price level is able to equate saving and investment (at full employment), the level of income will (at less than full employment). *How far income must fall below the full-employment level to do this depends on the slope of the consumption function.* Thus the consumption function, insufficient by itself to explain anything, becomes the kingpin of the Keynesian structure after all. This is what justifies Hansen in calling it the "heart of the Keynesian analysis," and which supports the extensive and continuing efforts to define, refine, and to measure statistically the nature and stability of the relationship of income and consumption.