# Modigliani and Keynes

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There cannot be many economists whose very first published work achieved the fame and influence of Franco Modigliani's 1944 article "Liquidity preference and the theory of interest and money". He was 26 years old then; it was his doctoral thesis at the New School for Social Research in New York, to which he had gravitated (along with other refugees from fascism and nazism) after fleeing Mussolini's Italy in 1939. The article contains no acknowledgments and only few references to the literature. It is a fair guess that his main thesis advisor – if he had one at all – would have been Jacob Marschak. Elsewhere Franco described Marschak as his teacher and mentor; it was he who introduced Franco to the ideas of Keynes (I shall call him Franco because it would feel totally artificial to call my dear friend anything else).

When I was a graduate student, six or seven years later than Franco, we learned about Keynesian economics, not so much from *The General Theory* itself, but from a few key articles that condensed Keynes's argument into simple, unambiguous mathematical or diagrammatic form. There were several of these expositions: the most important were by John Hicks (1937), Oskar Lange (1938) and Franco. He had read these earlier papers and learned from them, even before he read *The General Theory*, but his own particular emphasis was slightly different, more particularly monetary.

Franco and I shared the opinion that Keynes was the most important economist of the 20th century, and *The General Theory* the single most important work. Why did we not make use of it directly and have our students read it? (James Tobin's first exposure to Keynesian economics came from the book itself, when he was still an under-

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*BNL Quarterly Review*, vol. LVIII, nos 233-234, June-September 2005, pp. 11-19.

graduate; but that was pure accident.) I do not remember ever discussing this with Franco. My view is that *The General Theory* is a confusing book, very difficult for students. It contains several different lines of thought that are not brought coherently together. They may even be in some respects mutually inconsistent.

The articles that I mentioned did not have that luxury. Their virtue was that they described the properties of a precisely described 'model economy'. Each of them pursued just one line of thought – and caught it. In so doing, they simplify, as I said at the beginning.

What I have described as a virtue – and Franco would certainly have agreed with this – some Keynesian economists regarded as a vice. Either they preferred some other strand of ideas to be found in the book, usually a not very well specified one, or they thought that the value of Keynes's work actually resides in the multiplicity of imperfectly coordinated ideas, so that simplification into a specific model is a falsification. I do not want to argue this sort of question here; Franco's own writing showed where he stood, and it is his version of Keynesian economics that concerns me.

The 1944 article was, as its title announced, mostly about Keynes's theory of interest: the concept of liquidity preference as a determinant of the interest rate, and the function of the interest rate and the money supply in macroeconomic theory. It is interesting, then, that the main influence of the paper lay elsewhere. Franco insisted explicitly that the standard Keynesian assertions about aggregate output, employment and macroeconomic policy were fundamentally consequences of nominal wage rigidity (at least downward rigidity) and not especially of Keynes's theory of interest. Money and monetary policy have real consequences because money wage rates do not fall proportionally when money income and expenditure fall.

As you will see, he never changed his mind about that. If others argued that this reading sold 'the Keynesian revolution' short, because there is nothing startlingly original in the claim that wage rigidity can generate involuntary unemployment, Franco was unmoved. In the first place, he would say, wage rigidity is a fact in the modern economy, not just an interesting theoretical possibility; and, in the second place, there remains plenty to be learned about the mechanisms that convert wage rigidity into real economic fluctuations, and about the policy measures that can function as a remedy. That is what macroeconomics should be about.

Franco's way of formalizing wage rigidity was to define full employment as a situation in which employment was equal to the supply of labor, itself defined in the usual way as a function of the real wage (and perhaps other things). Suppose that current employment is less than full, and the current money wage is $w_0$. Then employment can and will increase, in response to increased demand for labor, with no change in the nominal wage, until the labor market reaches or approaches full employment. At full employment, the relation between the money wage and employment is derived quite classically from the volume of employment and the price level along the labor-supply curve.

The demand side of the 1944 model was taken directly from Hicks's "Mr. Keynes and the 'classics'"; the supply side of the model just said that the price level would be equal to marginal cost at the level of output determined by effective demand. Franco drew and shifted IS and LM curves in the standard way, although he was a little more careful about their shape at the extremes than most authors. This was the model that became 'Keynesian economics', to the satisfaction of some and the chagrin of others. Those of us who were more or less satisfied with the basic framework, including Franco and me, also thought that the model should be seriously improved and extended, on both the demand side and the supply side. Carrying out that program was the 'normal science' of the time in macroeconomics.

It may be worth mentioning that Franco writes the three basic building-blocks, the investment function, the saving function and the demand for money to hold, entirely in nominal terms (for instance, nominal investment demand is a function of nominal income and the nominal interest rate, and similarly for the others). Some authors prefer to model real investment or the real demand for money as a function of real income and the real interest rate. When it suited him, Franco was prepared to invoke the appropriate homogeneity properties, so not much hangs on this distinction.

In the article, Franco treats this model as a sort of 'general' theory, and he distinguishes two special cases. The 'Keynesian case' is what we call the 'liquidity trap', though I do not remember that he uses those words then, as he did later on. The demand for money and the LM curve become infinitely elastic at a low interest rate $r''$. "We have the Keynesian case when the 'full-employment equilibrium rate of interest' is less than $r''$. Increases in the money supply cannot in-

crease employment because they will be absorbed without noticeable effect on the interest rate. The location of the IS curve determines real income and employment.

The 'classical case' occurs when the equilibrium interest rate is so high that the non-transactions (asset) demand for money is essentially zero (the LM curve is perpendicular to the income axis). Changes in the interest rate leave the total demand for money unchanged; but only a change in the demand for money can move output and employment. A shift in saving and investment behavior can affect only the interest rate.

I think that this terminology is too restrictive. There are Keynesian forces and classical forces at work nearly all the time (it is only a slight distortion to think of these as effective-demand-side and supply-side forces). The limiting cases are just limiting cases; a sophisticated Keynesian economist and a sophisticated classical economist would not want to limit themselves to the extremes.

The key thing to remember is stated as one of the Preliminary conclusions of the paper (Modigliani 1944, pp. 75-76):

> "The liquidity-preference theory is not necessary to explain under-employment equilibrium; it is sufficient only in a limiting case, the "Keynesian case". In the general case it is neither necessary nor sufficient; it can explain this phenomenon only with the additional assumption of rigid wages".

In addition, as he shows, the combination of wage rigidity with a straightforward quantity-theory of money also behaves in a 'Keynesian' manner, not in the 'classical' vein.

I would only call attention to the use of the word 'equilibrium'. All that it means in this context is a solution to the equations of the model: IS-LM plus an elementary supply side. The 'rigid' nominal wage is whatever it is, a historical fact. Franco says that one may call this an equilibrium because no price or quantity that can move has any tendency to move; demand and supply are equal everywhere except in the labor market, but there is no tendency for the wage rate to change, because the wage is rigid.

Many later economists, including self-consciously Keynesian economists, have been skeptical of Keynes's claim to have found and explained an 'unemployment equilibrium'. To validate that claim, in their view, one would have to show that no agent – employer,

worker, consumer, investor – has any significant motive to change his or her behavior. In this context, obviously, the 'rigidity' of the money wage in the face of unemployment needs to be explained, behaviorally, motivationally, and not taken for granted.

Keynes himself offered one such explanation. If each group of workers is primarily concerned with its relative wage as compared with some natural reference group, then any reduction in a particular wage rate would be resisted because it must mean a deteriorating relative wage in that industry or occupation. Workers cannot bargain over the general wage rate. Keynes suggested that a reduction in real wages brought about by a rise in the price level would be accepted because all wages would be affected in the same way; relativities would not be disturbed. Other accounts have been suggested more recently. Franco did not evince much interest in this sort of analysis. My guess is that at this stage Franco would not have insisted on this rigorous notion of equilibrium. It was the fact of sticky wages that stood out. If it were to be called instead a persistent disequilibrium, that would not have mattered much to him.

Since those days many economists have deepened the notion of equilibrium with 'involuntary' unemployment, but those developments were in no one's mind in 1944. On the other side of the street, so to speak, it has been shown by others – Frank Hahn and myself, for example – that complete wage flexibility can bring its own problems. In our example, an explicit intertemporal model, wage flexibility can maintain perpetual full employment but only at the expense of plainly pathological fluctuations of investment and output. This possibility had been loosely foreseen by Keynes in *The General Theory*: the temporary need for 'equilibrium' deflation can force up the real interest rate and thus choke off investment (and thus future output), even without the presence of involuntary unemployment. Later on, Franco would notice, approvingly, another defect with wage reductions as a recipe for full employment: if prices fall proportionally with wages, the real wage may not change or might even rise, so there would be no stimulus to the demand for labor.

Sixty years later, at the end of his career (2003), Franco published an article aimed mainly at undergraduate students: "The Keynesian gospel according to Modigliani". Once again he (*ibid.*, pp. 6-7) tells them that Keynesian economics

> "starts by rejecting as an unrealistic fairy tale the classical postulate that wages and prices are sufficiently flexible in both directions so that the demand for money quickly adjusts to any given supply. At least in this century [...] the flexibility of nominal wages on the down side does not exist if it ever did".

Franco carries this reasoning a step further in defining the difference between Keynesian and 'classical' perspectives. The pre-Keynesian presumption had been that an excess demand for money would lead individual firms and households to try to increase their holdings of money by selling more and buying fewer goods. The attempt to add to aggregate holdings of money must fail, if the money supply is inelastic. But the resulting fall in wages and prices would increase the *real* money supply and clear the money market that way. This mechanism is blocked if nominal wages and, therefore, prices are rigid (Franco was by this time holding explicitly to a mark-up theory of the price level).

The role of liquidity preference – dependence of the demand for money on the interest rate – was to provide an alternative asset-market pathway to equilibrium in the money market. Excess demand for money would lead to attempted net sales of securities. The result would be higher interest rates and *this* would decrease the asset demand for money until the money market had cleared.

In 2003 as in 1944, however, Franco insisted that the possibility and stability of unemployment 'equilibrium' rested on the downward rigidity or stickiness of nominal wages. In more general terms, here is a mechanism through which nominal events can have real consequences: even more explicitly it shows how it is not the price level but real income, via interest-sensitive investment and the multiplier, that is the immediate variable that adjusts to nominal disturbances. This is the "essence of *The General Theory*" according to Modigliani. This set of ideas is what became known after the war, somewhat disparagingly, as "American Keynesianism". It is a little amusing that its founders include an Englishman, a refugee from Poland and a refugee from Italy, along with a handful of Americans like Samuelson, Tobin and Solow.

I have not mentioned the life-cycle theory of saving, because it will be discussed separately by others. In one respect, however, it has a particular relevance to this version of Keynesian economics. Like the permanent income theory, it makes real or nominal consumption

spending relatively insensitive to current income. The result, of course, is that the short-run multiplier is that much smaller. In other words, a larger part of the effectiveness of monetary policy is made up of induced investment spending. The intermediate-run dynamics also takes on greater significance as the long-run effects work themselves out, but those matters cannot be taken up here. Recent events in the United States would lead anyone, including Franco, to the conviction that short-to-medium-run consumption behavior can be substantially influenced by irregular but fairly persistent forces. Some of these may relate to the way that consumers interpret the effect of one-time events on their life-cycle prospects or permanent income, but it is in the nature of irregular forces that they are hard to categorize.

Toward the end of the 2003 paper, Franco mentions two other matters that should be recorded for completeness. The first is a brief and conventional discussion of fiscal policy as a stabilization device, emphasizing the importance of the degree of accommodation afforded by the central bank: the extreme cases are that the bank holds the money supply constant or that it expands or contracts the money supply so as to keep the interest rate constant. I want to quote and endorse the last paragraph of this passage (*ibid*., p. 22).

> "The Keynesian recognition of the possible employment effects of fiscal policy has given origin to a widely held view that the essence of Keynes is the advocacy of fiscal deficits. While this association might have had some basis [...] in the immediate aftermath of the Great Depression, it is totally false at present. In particular, my view, which I believe would be broadly acceptable to those who understand the fundamental Keynesian message, is that employment stabilization should be primarily the responsibility of monetary policies, except for automatic fiscal anti-cyclical stabilizers, while the main effect of non-cyclical budget deficits should be recognized as that of redistributing resources between generations".

I would only add that discretionary fiscal policy has a few other functions: effects on static resource allocation, on income distribution and – when necessary – on persistent excesses and shortages of effective demand.

The second note is about the possibility of real-wage rigidity and the more or less insoluble problem it poses for monetary policy in response to an adverse supply shock, like the great oil crises of the

1970s. The problem is that workers try to make up for the loss caused by the initial rise in prices; and firms try to cover the rise in unit labor costs by raising prices further. Downward nominal rigidity remains, so tight money is genuinely contractionary.

> "This dilemma, between accommodating inflation or risking high unemployment, arises whenever there is endeavor to pursue a real-wage target inconsistent with the mark-up target of firms" (*ibid.*, p. 23).

The dilemma exists even without strict mark-up pricing because no one is prepared to bear the cost imposed by the initial loss of effective productivity. One is tempted to look for a political solution, if only there were one. Modern Keynesianism is at least willing to face up to the problem.

At the end, I want to come back to the place of 'American Keynesianism'. I am not sure that Franco would have agreed with me – though I guess he might – but I do not think it matters in the slightest whether this approach to macroeconomics is 'the essence of Keynes' or something else. Axel Leijonhufvud wrote a once much-discussed book called *Keynesian Economics and the Economics of Keynes*. He maintained that there was a difference between them, and that the economics of Keynes was what mattered. I think that figuring out 'what Keynes really meant' is an antiquarian interest. That the question can be asked already suggests that it is a confusing book. To my way of thinking, it is Keynesian economics – constructed, as I pointed out, by a multinational crew – that matters, its successes and its failures. Normal science is the product of a research community.

An instructive comparison is with the theory of evolution. Charles Darwin created a great intellectual revolution. Evolutionary biologists may read *The Origin of Species* today for its general historical interest, because it is a landmark of biological thought. But today's 'Darwinism' is what later evolutionary biologists have made of it. Some of that body of knowledge repeats and extends what Darwin wrote. Some of it must be at odds with Darwin's own ideas and beliefs. Most of it concerns issues that Darwin could not have known about because they depend on concepts and observations that came after him. As between Darwinian biology and the biology of Darwin, there is no doubt which should be taught to students today.

So the architects of modern – not really American – Keynesian economics, among whom Franco Modigliani has an honored place,

have constructed a body of macroeconomic theory. It is actually not much in favor in elite universities today, for reasons that can be disputed. It is clear that Franco, as late as the year he died, believed it was the best available tool with which to understand the most important developments in the industrial world. Whatever gets written in learned journals, my guess is that if you were to wake up a representative macroeconomist in the middle of the night, tell him that the European Central Bank has just raised its interest rate by 100 basis points, and ask him what will happen next, he will begin by shifting IS and LM curves in his head. And that is something he learned either directly or indirectly from Franco Modigliani and his friends.

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