

Franco Modigliani and oligopoly

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1. Some personal recollections

I met Franco in 1948 – over half a century ago! – in Chicago, when he was teaching at the University of Illinois, where I had arrived with a research scholarship. He and his wife Serena would often invite me to dinner, and we would go on talking long into the night, until Serena had no choice but to send me on my way. I spent the period from January to September 1949 at Cambridge, continuing in my role as a researcher, and at Harvard came into frequent contact with Schumpeter. I became personally acquainted with Salvemini, who had an office at that University, having taught history there until a few years before. For me he was like one of the family, since my father – a staunch anti-fascist from Puglia – had brought me up to love and admire him. Shortly after my arrival in Cambridge a room became vacant in the cottage where I had found accommodation, and Salvemini moved in; and so it was that every morning I would set out in the company of a ‘piece of Italian history’, and I did my best to take advantage of the situation preparing all sorts of questions in advance. For his part Franco revered Salvemini, and when he came to Harvard from Chicago on a brief visit I introduced them. From then on they kept up regular if not intensive correspondence. Franco was drawn to Salvemini not only on the intellectual plane, but also at the level of political and social commitment. Franco used to visit Italy every year since Rome was his home town and he had lived there until his first year at university, when he was compelled to emigrate as a Jew: here he had his mother, brother and other relatives, as well as a great many friends.

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2. Franco Modigliani's interests as an economist. Oligopoly

Franco's interests as an economist cover five main fields: Keynes and unemployment, monetary mechanisms and real mechanisms, prices and wages, saving and life cycle, and company finance. Naturally, these are not watertight compartments. We shared an interest in these fields, but our main common interest became the third one, that of the mechanisms at work in determining prices and wages. To begin with, there was my book on oligopoly published in 1956, and subsequently revised in the following editions. Franco was favourably struck by it and wrote a review article dealing with both my book and a book that had come out in the same months by Joe Bain entitled *Barriers to New Competition*. Franco's article, "New developments on the oligopoly front", appeared in the June 1958 issue of the *Journal of Political Economy*. The overall judgement of my analysis was decidedly positive, and the article prompted the then director of the prestigious series published by the Harvard University Press, John Kenneth Galbraith, to have the book translated and bring it out in the series, which in turn led to invitations and translations of that and other books in various countries. All this I owe to Franco. As was to be expected, he had some reservations about certain points of my analysis in his review. I, too, had some reservations about his interpretation of my model, the main one being that he found in it an essentially static approach with promising leads for dynamic analysis, while I set out to present a dynamic analysis from beginning to end. My analysis of the determination of prices might also be seen as static, but it was designed to prepare the basis for an explanation of variations in prices. Franco embarked on an analysis of price determination in quite an original way, pointing out that his intention was not to offer a faithful account of the arguments set out by Bain and myself, but to develop the logical essence of our approach (Modigliani 1958, p. 402).

The model for the determination of prices and their variations in oligopoly is called the 'full cost', or 'mark-up' model, and is based on the concepts of 'exclusion price' and 'elimination price'. Fundamental for the identification of the levels of these two types of prices is the extension of the market (the volume of sales at a certain price), which is however to be considered together with the absorption capacity of the market itself and the distribution of sales among firms of various

sizes. The absorption capacity is given by elasticity of demand, which does not mean the infinitesimal elasticity of traditional theory, but a notion that contemplates finite variations, which I call “empirical elasticity”. In an economy that is developing, the extension of the market tends to increase over time, with effects on both firm sizes and costs which in turn play the most important role in the determination of prices and their variations.

These are features of my analysis, while Franco’s focuses on the characteristics of the traditional demand curve and disregards development. Moreover, Franco dubbed as “Sylos’s postulate” the assumption that, in order to discourage the entry of new firms, the existing firms leave their production unchanged if newcomers enter the scene. It is an assumption in stark contrast with that of traditional theory, which has it that the firms are compelled to cut down on their production if new firms come in: from my viewpoint this is the case in conditions of perfect competition, but not in those of oligopoly. However, it is in any case not the rigid assumption one might expect when the term ‘postulate’ is brought in: my point is that the assumption applies in certain market conditions – I begin with a market situation ‘*cr  e au hasard*’, considering a certain economic space and a given ‘empirical elasticity’ of demand – but not in others. Nevertheless, the fact remains that the existing firms do not necessarily adjust production when other firms attempt entry. Between myself and Franco there are no logical contrasts, but different assumptions, and thus different lines of analysis.

It is an issue of some importance since it is not a matter of the determination of prices and their variations in a very particular form of market but involves the whole theory of prices. On the one hand, we have the traditional theory, based on general market equilibrium, which is in turn based on the – totally unrealistic – assumption of generalised perfect competition, while on the other hand there is the non-traditional theory which assumes non-competitive forms of market – and in particular oligopolistic forms, now to be observed in various configurations in industry and the services. In agriculture we see competition of the classical type, which presupposes there are no obstacles to entry, but which, nowadays, in the advanced countries where public intervention in support of prices is the rule, can be considered irrelevant since in advanced countries agriculture has limited importance. The theory of non-competitive forms of market

can offer the possibility to interpret not only the determination of prices, but also their variations. To explain the trend in the general level of prices the traditional theory, in the form it most commonly takes today, suggests that such a trend must be viewed in connection with monetary policy and demand, while for the non-traditional theory it is the costs, and in particular wages, that are to be taken as terms of reference. Basically, this theory is founded on the principle of full cost.

3. Dynamic analysis

Franco made frequent use of dynamic analysis both in his various theoretical works and in his contributions to the formulation of two econometric models. The first of these models, developed by a group of economists under Franco's guidance on the initiative of the Federal Reserve System, the MIT and the University of Pennsylvania, had to do with the American economy, while the second, again the fruit of teamwork under his coordination, was a Bank of Italy project and concerned the Italian economy. These models shared certain features with a model I had been working on not long before and published in 1967, but they were rather more complete and complex (like myself, Franco had a positive passion for empirical verification). Various other models had already appeared, but these had the great virtue of treating price variations in simple terms – the dynamic use of a rationalised form of the full cost principle presents no great difficulties. As I recall, the principle takes for reference the direct cost, variations in which are determined by variations in the unit cost of labour, which is in turn given by the ratio between wages and labour productivity, and variations in the prices of raw materials and energy, while the fixed unit cost and expenditure for capital invested are covered by the mark-up. As for wages, Franco and I used an extended form of the so-called Phillips curve taking into consideration among the independent variables not only unemployment, but also the cost of living, variations in which are in turn seen as dependent mainly on variations in producer prices and commercial services, accounted for by means of the full cost principle. For years marked by strong social conflict I used the number of strikes as auxiliary variable.

4. The investment function

In his analysis of the function of investments Franco started from a study by Bishop and succeeded in combining analytic elements drawn from traditional neoclassical theory, and also from Keynes and the analysis of prices in oligopoly. Neoclassical theory gave him the production function, Keynes the concept of expected profits and the role of interest, the Keynesians the capital/product ratio and technological progress in the extremely simplified terms of Harrod, and oligopoly theory a means to determine expected prices.

Franco had come to the fore with his 1944 article on “Liquidity preference and the theory of interest and money”, in which he discussed the central point in Keynes’s book – published just a few years before – namely ‘equilibrium unemployment’, concluding that it depended mainly on the assumption of downward wage rigidity – here Franco departs from Keynes. Original and important, on the other hand, was his ‘liquidity trap’ theory, although Franco saw it as theoretically significant but of little practical utility – a judgement he would probably have modified after the long Japanese stagnation with interest close to zero and negative real interest, and indeed after recent experience in America. Keynes had a valid but extremely simplified conception of price determination – prices depended essentially on wages. If, however, the expediency of adopting the full cost principle is recognised, then the formation of prices appears far more complex, and to have important interpretative implications, as can be seen with both Franco’s investment function and the – very different – investment function I formulated for my econometric model. Nevertheless, the fact remains that while the models of traditional theory are static and lend themselves little – if indeed at all – to dynamic analysis, Keynes’s static theory can readily be adapted without forcing to formulate dynamic models, as demonstrated by the models offered by Harrod, Domar and various other Keynesian economists. Ultimately, many works by Franco himself, such as the study on fluctuations in the saving-income ratio of 1949 and the life-cycle model, presented in 1960 and further developed in various other works, can be viewed within this perspective.

5. Unemployment and inflation

Unemployment was a recurrent object of concern in Franco's analyses, showing both his involvement as an economist and his civil commitment. His last endeavour in the field led to a Manifesto on unemployment in Europe in 1998. Launched by Franco, the "Manifesto" was the fruit of the combined labours of six economists, including myself, while a very considerable number of the world's leading economists vouched their broad support. The work was coordinated by Beniamino Moro. Here I shall confine my remarks to recalling that the "Manifesto" recommended a variety of measures, the main one being in favour of a powerful new boost to investments, private and public, and policy by the Central European Bank in support of the relaunch, putting behind it worries about fomenting inflation, which we all then saw as quite a remote risk.

Analysis of inflation – of the forces, that is, that bring about a sharp rise in prices – can be carried out adopting the traditional theory of prices or the approach associated with the theory of oligopoly, seen as the most common form of market, with various configurations in industry and the services. According to the traditional theory, the decisive impulse comes from the flow of monetary means; when the flow increases too rapidly, inflation looms up. On the other hand, in oligopoly theory – let me put it thus for the sake of brevity – apart from certain exceptional periods like wartime, when the government prints a huge quantity of banknotes to meet urgent needs, the monetary flow normally accompanies production and may surpass it; however, the force driving prices up does not come from money but from cost items such as wages, the prices of raw materials and energy sources. Rises in the cost of living can also be brought about through public intervention, such as tariff and indirect tax hikes.

Wage increases depend on unemployment, variations in the cost of living – including the prices of public services and rents – and, in certain periods, the frequency and intensity of strike action. Wages, that represent the most important variable, depend principally on unemployment: governors of central banks look first of all at the behaviour of unemployment to take their decisions and, in certain periods, other cost items like oil prices. I believe that some central bankers, like Greenspan, helped by their native pragmatism and scant

confidence in the traditional theoretical models, pay relatively little heed to the rate of liquidity growth, which does not constitute a real problem in peacetime, but attach great importance to unemployment and the conditions of development. Other central bankers seem to follow the two criteria simultaneously: they are monetarists but, at the same time, keep close track of variations in unemployment and income; as far as we can tell from their policy, however, their main concern is with money, excess of which can generate inflation. The “Manifesto” points out the error of this attitude, and the fact that in normal conditions the primary aim of credit policy must be to favour investment and employment; any fear that such a policy might lead to inflation was out of place seven years ago, and it remains so today. It is, of course, true that as a rule the cost of living is not stable in the advanced countries but tends to grow at a rate of 2-3% a year – a trend I have described as ‘structural inflationary pressure’. The increase is not to be attributed to money, however, but to the increasing unit cost of commercial services, where wages rise as in the industrial sectors but productivity grows more slowly and, often, with increases in charges. The “Manifesto” certainly does not go into this type of analysis, but it is my conviction that, as far as price variations are concerned, the approach is in perfect accord with the position taken by Franco and the other authors.

The “Manifesto” has, I believe, retained its relevance. Today, however, I would suggest particularly close scrutiny of the prospects facing the American economy, which conditions the economies of the other countries – notably in Europe – and is in turn conditioned by the weight of various types of debts. And I would recommend placing greater stress on the importance of research, both at the European level and within the single countries. There is a primary need for innovative investments, also because over the long period this is the only way to stand up to the competition of the emerging countries, which is fast growing ever keener for the products of the traditional industries.

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