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The theory of employment: two approaches compared

ALESSANDRO RONCAGLIA[*]

1. Introduction

This issue of our journal contains – together with an article by Parrinello (2014) on the distinctive features of demand-led growth models – a hitherto unpublished item of particular interest, namely a letter of 14 September 1956 from Franco Modigliani to Paolo Sylos Labini (with footnotes containing the annotations of the recipient: Modigliani, 2014a), found among the papers of Modigliani by Antonella Rancan, who has taken care of its English translation – the original letter is in Italian, and is published in the parallel issue of our sister publication, *Moneta e Credito* (Modigliani, 2014b) – illustrating in her article (Rancan, 2014) the historical context of the letter with extremely useful details on the friendship between the two economists and the theoretical and cultural background to their discussion.

This document is important both from a history of economic thought viewpoint, concerning as it does the relationship between two major 20th century economists, and from the viewpoint of the theoretical importance of many of the issues considered in the exchange. In this introductory article we shall focus primarily on the latter perspective, while considering only in a marginal way the influence of their epistolary debate on the development of their thought.[1] In the light of subsequent developments of our discipline, it is evident that both economists tried to develop and discuss theoretical models endowed with a strong link to the real world, so that their debate concerns simultaneously themes now confined to macro- or microeconomics, the theory of employment or to the theory of market forms. In this brief article I shall mainly consider the

[*] Sapienza University of Rome; email: alessandro.roncaglia@uniroma1.it. Thanks are due to Sergio Modigliani for authorising publication of Franco Modigliani's letter, and to two referees for their detailed and useful comments.

[1] For a first attempt in this direction, see Rancan (2015).

macroeconomic issues raised by Modigliani's letter and Sylos Labini's comments on it, notwithstanding the subsequent debate on oligopoly theory being mainly related to microeconomic and game theoretical issues.

In this article we will examine the issues raised in Modigliani's letter with three objectives in mind. The first is the most immediate: to bring Sylos Labini's point of view into sharper focus, and so cast light on his brief annotations to the letter. The second helps us towards the first but is rather more complex: to point out the basic differences between the two economists' approaches, Modigliani's 'neoclassical synthesis' (he made some essential contributions to its construction) and the approach taken by Sylos Labini, who harked back directly to the classical economists. Finally, the third objective overlaps with the second, namely to see how these two very different points of view can relate to one another. On the one hand, we will see the possibilities for collaboration not only on the purely scientific, but also on the academic and political level – and, on the other hand, the incomprehension that arose in discussion. This was shown particularly by the economist following the mainstream who, despite his respect for his colleague, could only grasp his innovative contribution by translating it into the terms of his own theoretical structure – indeed, as the letter shows, he felt duty bound to bring his friend back onto the right road that led through the theoretical structure he had departed from.

To pursue these objectives within the limits of a brief article a useful starting point (see section 2) lies in the theory of employment proposed by Modigliani in his celebrated 1944 article (and further developed in his article of 1963, precisely to take into account certain aspects, like the existence of oligopolistic markets, brought to light in Sylos Labini's book of 1956). As we know, Modigliani's theory constitutes the core of the so called 'neoclassical synthesis', in the sense – as we will see – of a synthesis between the traditional marginalist theory based on equilibrium between the demand and supply of factors of production and the elements considered innovative in Keynesian theory. We will also see how the analytic framework proposed by Modigliani departs only slightly, and only in a few aspects that we may consider secondary, from the

'Pigouvian' framework that Keynes set out to contest with the *General Theory*.

The 'Sraffian' critique of an aspect central to the neoclassical synthesis, namely the inverse relationship between real wages and employment, was subsequent to Modigliani's letter, although some of the points were in circulation (as evidenced in an article by Joan Robinson, 1953); in circulation, too, was the idea of returning to the approach of the classical economists, prompted in particular by Sraffa's edition of Ricardo's *Works and Correspondence*, published between 1951 and 1955. An economist well aware of these issues was Sylos Labini; he had gone through a period of study at Cambridge (1950-1951) under the supervision of Dennis Robertson whilst also spending some time with Piero Sraffa and Joan Robinson in particular. From his graduate thesis onward, Sylos Labini had on his own initiative adopted the approach of the classical economists, stressing in particular the dynamic aspect, with an eye to the role of technological progress. These were the factors that led him to study with Schumpeter at Harvard (1948-1949), and which emerged from his studies reinforced.[2]

Sylos Labini's inevitably fragmentary answers to Modigliani, actually simple jottings in the margin of the letter, thus rested on an articulated dynamic conception owing much to his return to the classical approach. Full awareness of the analytic weakness of the neoclassical synthesis was to arrive only subsequently, with the debate on the theory of capital marking the 1960s and 1970s. What alienated Sylos Labini from the neoclassical conception from the very beginning of his studies was above all its static nature and the exogenous role attributed to technical progress, upon which the evolution of the economy mainly depended.

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[2] In his writings, Sylos Labini repeatedly stressed Schumpeter's attention to the themes of dynamic change and technical progress; however, in important aspects of his theoretical edifice Schumpeter relies on the traditional marginalist theory of value and distribution (see Roncaglia, 2005, pp. 416-434). These elements of Schumpeter's thought remained extraneous to Sylos Labini's way of thinking, while the classical approach was a constant in his thought: *Torniamo ai classici* ("Let's go back to the classics") is the title of one of Sylos Labini's last theoretical texts (2004).

The analytic structure of the neoclassical synthesis and its limitations will be illustrated in sections 2 and 3, while section 4 is devoted to an examination of the various different interpretations of the theory of oligopoly, which constitute the immediate background to the letter and in particular offer counterproof of the different approaches taken by the two economists and the difficulty Modigliani had in understanding Sylos Labini's position. Finally, section 5 turns to the debate on economic policy and looks at the affinities and differences in the positions of the two economists. The conclusions, in section 6, focus on the lessons that can be learnt from the collaboration between the two great economists.

2. The neoclassical synthesis

Before concentrating attention on Modigliani's contribution (1944; 1963), let us very briefly sum up its essential importance.

As we know,[3] traditional neoclassical theory in its various strands sees a full employment level as a point of stable equilibrium in the economic system, in the presence of a competitive labour market. This theory was contested by Keynes, who discerned in the *General Theory* (1936) the possibility of an underemployment equilibrium.[4] Despite the success of Keynesian theory both culturally and in terms of policy with its prescriptions for fiscal and monetary intervention to support employment in the face of the persistent effects of the Great Crisis, traditional marginalist theory continued to thrive in academic circles. This gave rise to a series of attempts to reconcile the two positions, relegating Keynesian theory to the short period (albeit a short period that could be considered highly relevant to policy, thus safeguarding ample scope for Keynesian policies) while reaffirming the validity of the traditional theory for the long period. The mediation was to prove unstable, as attested to by the subsequent monetarist throwback and,

[3] For a less apodictic treatment, see Roncaglia (2005), and the bibliography included there.
[4] See Tonveronachi (1983) on this point.

above all, the so-called 'new classical economics' based on rational expectations.[5]

The first attempt at reconciliation was by Hicks (1937), who incorporated certain Keynesian findings (the role of income in determining savings, speculative demand for money, the interaction between real and monetary variables) in an extended 'classical' framework, but leaving out of his analysis an aspect crucial to the comparison, namely the labour market (as well as neglecting the role of uncertainty, which Keynes deemed central, and consequently distorting the theory of speculative demand for money). Modigliani (1944) may take credit for including the labour market, too; nevertheless, the result is to offer a 'Keynesian' analytic model very closely resembling pre-Keynesian theory, and more precisely the theory developed in various works by Pigou, which Keynes had set out to contest.[6]

We may obtain a clearer picture of these aspects with some simplified versions of the models constructed by Pigou and Modigliani.[7] For the sake of simplicity we will take labour supply, L_o, as given, while labour demand, L_d, proves a decreasing function of the real wage as a consequence of the flexibility of the capital-labour ratio: an increase (reduction) in real wages makes utilisation of the labour factor less (more) advantageous, thus incentivising the choice, among the available productive techniques, of a more capital-intensive (more labour-intensive) technique than the one in use before the increase (reduction) in wages. When there is unemployment, in a competitive labour market the surplus supply of labour drives real wages downwards; this in turn brings down the capital-labour ratio, thus raising the labour demand so that the unemployment is reabsorbed.

If we indicate with X the real income, with N employment, with W the money wage, with P the level of prices, with M the money supply,

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[5] The latter is, as we know, based on the thesis that if there is a long-period stable equilibrium, then the rational economic agents will also take it into account in their behaviour over the short period, making attainment of the long-period position immediate.

[6] Pigou was professor of economics at Cambridge, and a designated heir of the Marshallian tradition: an essential reference point for Keynes's criticism.

[7] The treatment of the three models that follow is drawn, with a few modifications, from Roncaglia and Tonveronachi (1985). See also Roncaglia and Tonveronachi (1978).

with k the inverse of the velocity of circulation of money (the so-called Cambridge k), with ’ the first derivative and with ” the second derivative, we can set out the simple ‘Pigou pre-Keynes’ model (Pigou, 1927; 1933), which encapsulates the mainstream macroeconomic theory before Keynes:

$$X = X(N), \qquad \text{with} \quad X' > 0 \quad \text{and} \quad X'' < 0, \tag{1}$$

$$W/P = X'(N) \tag{2}$$

$$M = k \cdot P \cdot X \tag{3}$$

In this model the money supply, given exogenously, determines the monetary income $(P \cdot X)$ through an equation derived from the quantity theory of money in which the velocity of circulation of money is given (equation 3); equation 2 indicates the labour market equilibrium condition for which the real wage is equal to the marginal productivity of labour; equation 1 is the neoclassical production function, in which a decreasing marginal productivity of labour is assumed. The exogenously given money wage then determines the decomposition of the monetary income in the price and quantity elements, and thus employment. We can summarise the three equations in a single expression:

$$M/W = k \cdot X(N) / X'(N) \tag{4}$$

Thus we have a positive relation between the stock of money expressed in terms of money wage and the level of employment. Thanks to the properties of the neoclassical production function, and in particular the hypothesis of decreasing returns, in the presence of unemployment money wage flexibility suffices to ensure the tendency towards full employment equilibrium, given the money supply. Alternatively, full employment can be attained, for any given money wage, through an expansion of the money supply, bringing about an increase in prices and thus a reduction in the real wage.

As we will see, these basic characteristics of the pre-Keynesian model remain unchanged in the neoclassical synthesis models, constituting the basis for Modigliani’s critical observations on the second part of *Oligopolio e progresso tecnico* (Sylos Labini, 1956) in his letter of 1956. Developments in neoclassical theory after the publication of Keynes's *General Theory* incorporate certain formal elements of Keynesian theory while maintaining essentially intact the mechanism of automatic re-equilibrium towards full employment based on the downward flexibility of the real wage, coming about either directly in a competitive labour market as an effect of unemployment, or, with downward money wage rigidity (due to non-competitive labour market conditions), as an effect of implementation of an expansive monetary policy. We can illustrate this fact with reference to two models: the first represents Pigou's macroeconomic theory in his writings subsequent to 1936 (Pigou, 1937, 1938, 1941), the second Modigliani's so-called 'neoclassical synthesis' (1944; 1963).

We will indicate with *I* investments, with *S* savings, with *i* the rate of interest, and with *V* the velocity of circulation of money; and we will measure *I*, *S* and *X* in wage units, as Keynes does in the *General Theory*. We then have:

$$I = I(i) \qquad \text{with } I' < 0 \qquad (5)$$

$$S = S(i, X) \qquad \text{with } S_i' > 0 \text{ and } S_x' > 0 \qquad (6)$$

$$I = S \qquad (7)$$

$$W \cdot X = M \cdot V(i) \qquad \text{with } V' > 0 \qquad (8)$$

$$X = X(N) \qquad \text{with } X' > 0 \text{ and } X'' < 0 \qquad (9)$$

Equations 5-7 can be encapsulated by our old friend the IS function (proposed by Hicks in his 1937 article, which departs from the Pigouvian framework illustrated here by explicitly taking into account in the LM function the speculative demand for money, which here remains implicit in the influence of the rate of interest on the velocity of circulation of money):

$$i = i(X) \qquad \text{with } i' < 0 \qquad (10)$$

and from equations 8 and 10 we obtain:

$$M/W = X/V[i(X)] \tag{11}$$

from which emerges once again a positive relation between the stock of money expressed in wage units and the level of production; equation 9 then gives us the link between income level and employment. Once again, the trend towards a full employment equilibrium is ensured by the flexibility of the relation between the stock of money and the money wage, and thus by the flexibility of the money wage (given the stock of money) in the presence of unemployment, namely by competitive conditions in the labour market, or by an expansive monetary policy which, the money wage being given, brings about a reduction in the real wage through a rise in the level of prices.

The ‘neoclassical synthesis’ of Modigliani (1944; 1963) can be illustrated with a few minor simplifications through the following model:

$$S = S(i, X) \qquad \text{with } S_i' > 0 \text{ and } S_x' > 0 \tag{12}$$

$$I = I(i, X) \qquad \text{with } I_i' < 0 \text{ and } I_x' > 0 \tag{13}$$

$$I = S \tag{14}$$

$$X = X(N) \qquad \text{with } X' > 0,\ X'' \leq 0 \tag{15}$$

$$X'(N) = W/P \tag{16}$$

$$W = aW_0 + (1-a)X'(N)P \qquad \text{with } \begin{cases} a = 1 \text{ if } N < N^f \\ a = 0 \text{ if } N = N^f \end{cases} \tag{17}$$

with N^f indicating the full employment level;

$$M_d = P \cdot L(i, X) \qquad \text{with } L_i' < 0 \text{ e } L_x' > 0 \tag{18}$$

$$M_d = M_s \tag{19}$$

Leaving aside for the moment the money wage equation (or, better, considering in it a = 0), systems 12-19 can be summed up in three equations: IS, LM, and the real wage as a function of employment:

$$i = i(X) \qquad \text{with } i' < 0 \tag{20}$$

$$M/P = L(i, X) \qquad \text{with } L_i' < 0 \text{ and } L_x' > 0 \tag{21}$$

$$W/P = X'(N) \qquad \text{with } X'' \leq 0 \tag{22}$$

In turn, these three equations can be encapsulated in a single expression:

$$M/W = L[i(X), X]/X'(N) \qquad \text{with } dX/d(M/W) > 0 \tag{23}$$

bearing out the main feature of the previous models: employment proves an increasing function of the money supply, the money wage being given, and a decreasing function of the money wage, the money supply being given. The downward flexibility of the money wage ensured by a competitive labour market in conditions of unemployment entails the tendency towards full employment equilibrium; if there is money wage rigidity, then the necessary reduction of the real wage can be attained with an expansive monetary policy, raising prices.

The complications that can be introduced in the basic model (e.g. introducing wealth alongside income as an explanatory variable in the consumption function, as Modigliani did in his 1963 article, on the basis of his life-cycle theory of saving) do not affect this characteristic. After all, this is nothing but applying to the labour market the marginalist way of reasoning, based on two methodological principles: first, that the price (in this case, the wage) is determined by the equilibrium between supply and demand, and second, that price flexibility always brings quantities supplied and demanded to their equilibrium levels.

Modigliani's adherence to this theoretical structure accounts for his criticisms of Sylos Labini's book, and the second part of it in particular (we will deal with the criticisms regarding the first part of the book in section 4). The first criticism, advanced as the most general, has to do with the fact that technical progress can generate unemployment "only in conjuction with certain assumptions – indeed fairly reasonable – on real wage rigidity" (p. 284): if the real wage is flexible, the unemployment initially generated by technical progress *must* be reabsorbed. Modigliani dwells on this point emphatically, considering it a "essentially erroneus"

(p. 284). Unable even to conceive of the idea that this 'error' is in fact a consequence of the different theoretical approach adopted by Sylos Labini in which the automatic tendency towards full employment does not come about, Modigliani puts it down to the lack of the production function in the model adopted by Sylos Labini (p. 304) or to "confusion between real and monetary phenomena" (p. 300). Sylos Labini's concise answer to this in the margin of the letter is that effectively his analysis contains a production function of the simplest type ("the *X* coefficient"), and that he has implicitly adopted "the assumption of the neutrality of money" (*ibid*.): clearly, this is a synthetic way of pointing to the simplifying assumption of the absence of money from his analysis, which allows attention to be focused on the central thesis of the book, namely that the oligopolistic market form has 'real' effects on employment, without having to address the issues of the interaction between real and monetary variables.[8]

On other points, too, Modigliani's criticisms have to do with Sylos Labini's adoption of elements that are atypical as far as the neoclassical synthesis model is concerned. Thus, for example, Modigliani points out the "confused" (Modigliani, p. 301) definitions (not in terms of aggregate value but in physical terms) of machinery and capital used by Sylos Labini in his numerical examples, as well as the reference to the monetary value of investments (inclusive, therefore, of advances to workers of their wages) rather than measuring them in terms of productive capacity. Sylos Labini never took to the concept of capital as factor of production; Modigliani failed to see how it could possibly be dispensed with.

Similarly, Modigliani argues that a change in the distribution of income with an increase of profits cannot generate 'Keynesian' problems of effective demand unless there is real wage rigidity (and Modigliani adds that in this case his studies on saving – known as the life-cycle theory of saving, Modigliani and Ando, 1957 – lead him to maintain that changes in the distribution of income have no effect on overall savings). Further criticisms advanced by Modigliani are of the same type, even concerning matters of detail, but in other cases his criticism points to improvements that could be

[8] We can speak of neutrality of money in the sense that monetary retroaction effects (namely the influence of real variables considered in the analysis on monetary and financial variables, and of these in turn on real variables) are excluded.

made to the exposition, and Sylos Labini notes that he had already modified accordingly his 1956 text upon drafting the 1957 version; the former was published for private circulation and it is this edition that is referred to in the comments on the letter (this will also be pointed out in the new edition, Sylos Labini, 1957, pp. 49 and 162).

Modigliani is quite outspoken in his criticism, which is understandable given the friendly relations between the two which, clearly, no differences of opinion could sour, but also understandable given the fact that they are expressed in a private letter (trenchant criticism, especially of the second part of the book, would also be advanced in his review of *Oligopolio e progresso tecnico*: Modigliani, 1958, but 'softened' with a positive evaluation of the original contribution offered by the book on the subject of equilibrium price in oligopoly). However, the forceful tone Modigliani adopted in his criticism is due above all to the fact that he found logical errors that were inadmissible once the theoretical framework of the neoclassical synthesis is accepted, and he takes this framework for granted.[9] Clearly, however, Sylos Labini does not embrace this theoretical framework in *Oligopolio*, nor indeed in his previous or subsequent writings, and it is equally clear, today even more so than in the period of their correspondence, that the analytic weakness of the neoclassical synthesis bears out Sylos Labini's position. It is therefore worth taking a brief look at the weak points in the neoclassical synthesis.

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[9] A curious point of disagreement concerns the equality between price and marginal cost, which Modigliani held to apply in every case. Consequently, Modigliani assumes that the marginal cost can also be defined at the point at which the enterprise reaches full utilisation of productive capacity; if it is lower than the price before that point, on reaching the point it suddenly grows to equal price, and beyond; consequently, it remains true that, at the point of equilibrium of production, i.e. at the point of full utilisation of productive capacity, marginal cost equals price. By contrast, Sylos Labini argues that at that point there is a discontinuity in the marginal cost function so that there is no sense in speaking of equality between marginal cost and price. In fact, if the equality between marginal cost and price is upheld, then at the point of full capacity utilisation it is the price which determines the marginal cost, and not the opposite as marginalist theory holds.

3. Criticism of the neoclassical synthesis and return to the classical approach

Actually, criticism of the neoclassical synthesis falls into three categories. In the first place, we have the destructive criticisms concerning the aggregate notion of capital and the direct relation between real wages and the capital-labour ratio. Secondly, certain criticisms were already implicit in Keynes's original treatment (taking, as we have seen, Pigou's model as its antithesis, pre-Keynesian by definition, but also very similar in structure to the neoclassical synthesis subsequently proposed by Modigliani). Thirdly, we may recall the criticisms levelled along the lines of the classical approach, fundamentally different even at the level of their conceptual roots from the neoclassical/marginalist approach; these criticisms do not concern the internal logic of the argumentation, but contrast it with a line of argument founded on different bases. Without going deeply into the issue, a brief review of the elements characterising each of these lines of criticism will prove useful.

The first category of criticisms derives from the debate on the theory of capital between the two Cambridges, UK and US, prompted by the publication of Sraffa's book in 1960. As we know, Sraffa recalls that capital consists of a set of commodities (means of production) that can vary in value with variations in the distribution of income between wages and profits. In a world with a number of commodities, the movements of the prices of the various means of production when distribution changes are complex, and there is no way to tell a priori whether, consequent upon a reduction in real wages, more labour-intensive or less labour-intensive techniques will prove relatively advantageous (i.e. whether or not the inverse relation between real wages and employment underlying the neoclassical synthesis model discussed above does in fact apply). Thus it cannot be stated as a general law that, if the real wage falls with unemployment in a competitive labour market, there will automatically be a tendency towards re-equilibrium through adoption of increasingly labour-intensive productive processes: the system may well move in the opposite direction. The same finding, i.e. the lack of an automatic tendency towards equilibrium except under special assumptions, is arrived at by the theory of general economic equilibrium: it is possible to demonstrate the existence of the equilibrium, but not its uniqueness or stability, which in fact characterise the one-commodity models (‘aggregate’ models) of mainstream macroeconomics, before and after Keynes.

The second type of criticism has to do with the fact that Keynes’s original analysis moved along lines extraneous to the neoclassical synthesis in some important respects. In fact, the development of models such as those illustrated above is accompanied by reinterpretation of Keynes’s contribution, eliminating certain of its characteristic elements, including uncertainty and the role of expectations, liquidity preference, the qualitative distinction between investment choices (exogenous, as relating to expectations regarding the long-period) and consumption choices (endogenous, being linked to income).

Uncertainty in Keynes does not correspond to the concept of risk proposed by Knight and in essence incorporated into the neoclassical synthesis.[10] According to Keynes, economic agents find themselves in intermediate positions between the two extremes of perfect knowledge (including the case of probabilistic risk, as in a game of dice) and total ignorance: closer to complete knowledge in the case of consumers and entrepreneurs who have to decide on levels of production, more distant from it in the case of entrepreneurs who have to decide on investments, while the uncertainty of the financial market operators is of a kind differing yet again, characterised by a very short decision horizon and conventional models of behaviour. Consequently, rather than a model of simultaneous equilibrium as in the case of the neoclassical synthesis, Keynes prefers the ‘short causal chains’ method proposed by Marshall, where analysis of the behaviour of consumer-savers, entrepreneurs and financial operators is carried out in distinct blocks.

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[10] Knight (1921) proposes a dichotomy between risk, of probabilistic type, and uncertainty, corresponding to an undifferentiated concept of ignorance; Keynes (1921) proposes uncertainty as the general case, but differentiated on the basis of the “weight of the argument”, i.e. the bundle of information available for the economic agent’s evaluation. See Roncaglia (2009) for an illustration of the differences between the two approaches, and Roncaglia (2012) for their consequences on risk assessment techniques in today’s financial markets.

With the first link in this chain,[11] liquidity preference in the money markets (in other words, expectations concerning interest rate shifts in the immediate future) determines the rate of interest (also taking into account the fact that the speculative demand for money, which applies to stocks of assets, relevant to financial decisions in the very short period, brings into play a mass of monetary and financial assets which exceeds, by various orders of magnitude, the mass mobilised by the demand for transaction money; by contrast, as evidenced by Hicks's 1937 LM schedule, the two types of demand for money are placed on the same level in the frame of the neoclassical synthesis).

The second cause and effect link, separated from the first as being situated on a different analytical plane, concerns determination of the aggregate level of investments on the basis of the interest rate and entrepreneurs' long-period expectations (animal spirits). Due precisely to the uncertainty surrounding them, the latter may even change abruptly, for example in response to changes in the political situation; it was precisely their instability, far greater than that inherent to decisions on production levels, that led Keynes to keep the two fields separate, investments being seen as exogenous while levels of consumption and the corresponding levels of production were considered endogenous. The latter were, in fact, determined through the income multiplier as the third link of the causal chain.

In the *General Theory* Keynes attributes to money the characteristic of having nil or at least a very small elasticity of production, thus avoiding the assumption of fully exogenous money.[12] In the neoclassical synthesis models on the other hand (and in marginalist theory in general, as may be seen in the case of monetarist theory), the assumption of exogenous money is essential. On the contrary, in an article published in this very journal in 1949, Sylos Labini – following here his master

[11] What follows cannot be considered a full though synthetic exposition of Keynes's theory, since it leaves aside the themes dealt with in the fundamental chapter 17 of the *General Theory* (see Tonveronachi, 1983); in our context it is however sufficient in so far as it allows a clear illustration of the differences in comparison to the neoclassical synthesis framework.

[12] For a specific reference, see Keynes (1936), p. 230; more generally, see chapter 17 of the *General Theory*.

Schumpeter, who was in turn influenced by Wicksell – criticises the Keynesian tradition (and in particular the American strand of Hansen and Samuelson) for being crystallised in the assumption of exogenous money. This difference, too, is reflected in the discussion examined here, although it represents a secondary aspect.[13]

The third line of criticism of the neoclassical synthesis lies, in fact, in contrasting it with a completely different conceptual framework, that of the classical economists revived by Sraffa, and not only in his 1960 book, but earlier on with his edition of the writings of Ricardo (1951-1955). In a nutshell, Sraffa contrasts the 'one-way road' of marginalist theory, leading from scarce resources to satisfaction of the economic agents' needs and desires, with the conception of the economy as a circular flow of production and consumption (or, as Sylos Labini put it twenty-five years later, in Sylos Labini, 1985, the 'spiral' conception, given that an economic system able to produce a surplus can increase in dimensions with each circuit).

The main difference between the two approaches lies in the role of equilibrium between demand and supply: in marginalist theory it provides the key to determine the theoretical variables, while in the classical approach production prices are determined by the condition of reproducibility of the system, and thus by the difficulty of production of the various commodities and the competitive assumption of a uniform rate of profit in the various sectors.[14] In the case of the classical approach,

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[13] In his letter, Modigliani ascribes to Sylos Labini the assumption of a given quantity of money, and criticises him for it: as we have seen, according to Modigliani an active monetary policy can eliminate unemployment, doing away with Sylos Labini's worries about the negative effects of technical progress in an oligopolistic system. Sylos Labini answers that he has not adopted the assumption attributed to him, but, rather, that of the neutrality of money, with the aim, as noted above, of focussing attention on the 'real' effects of the oligopolistic form of market.

[14] In the classical approach, the 'difficulty of production' is expressed, from William Petty onwards, in physical terms of the means of production necessary to obtain a given quantity of a certain commodity (or a vector of commodities, in the case of joint production), and thus differs from the concept of 'cost of production', which is a magnitude determined in terms of value. See Roncaglia (1978). Sylos Labini's tendency to illustrate his analysis with numerical examples in terms of the number of machines and not in terms of value corresponds to this aspect of the classical approach; Modigliani's diffidence about this type of example and his preference for aggregate magnitudes or

as Sylos Labini was to argue in subsequent works (e.g. Sylos Labini, 1987), the level of employment is "historically determined", and not deduced as the solution to a static system of equations, as in the neoclassical synthesis.

Naturally, Sylos Labini had yet to determine all the coordinates of his position at the time of the debate, and here at least we may find some justification for the incomprehension Modigliani shows at the points where his friend departs from the path of the dominant theory. Nevertheless, to weigh up the discussion between the two friends today we must bear in mind how radically alternative Sylos Labini's approach was to the marginalist approach.

4. The theory of oligopoly, between neoclassical synthesis and the classical approach

Once again, as in the case of the theory of employment, in comparing the positions of Sylos Labini and Modigliani – in this case, on the theory of oligopoly, and thus on the first part of the book by Sylos Labini, together with Modigliani's (1958) review of it and the remarks on the first part of the book in his letter – we need to concentrate on the basic theoretical structure.

The theory of concentrated oligopoly[15] proposed by Sylos Labini arose from practical observation of significant economies of scale in many industrial sectors, and thus, in the presence of technological discontinuities, relatively large minimal dimensions of plant in comparison with the dimensions of the market.[16] This aspect

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magnitudes expressed in terms of value corresponds to the Marshallian approach, which was the most widespread version of marginalist theory in the Anglo-Saxon world at the time.

[15] "A funny name", Modigliani remarks, "that makes me think of tomato sauce!". Sylos Labini makes no comment in reply, but the term was to remain unchanged.

[16] Sylos Labini also considers the case of the differentiated oligopoly, but appears to attach less importance to it (and in fact, in the sectors of durable consumption goods we can speak of mixed oligopoly, given that the characteristics of differentiated and concentrated oligopoly coexist). Bain attaches greater importance to the case of differentiated oligopoly in his book that came out at the same time as Sylos Labini's

characterised, for example, the oil sector, which Sylos Labini had been looking into immediately before writing his book on oligopoly (see Sylos Labini and Guarino, 1956). Indeed, the high ratio between fixed and variable capital throughout all the phases of the oil sector, from exploration to production, transport, refining and distribution, had been highlighted in the best study on the oil industry then available (Frankel, [1946] 1969).

At its most essential, the theory of concentrated oligopoly boils down to this: when there is a high ratio between optimal dimension of plant and dimension of market, the entry of a new firm (and thus of new plant) brings about a significant increase in production and a consequent fall in prices. Therefore the current market price can yield a higher rate of return (rate of profit) than in conditions of competition with no new entry of firms in the sector; in fact, any such firms would take into account the situation that would come about once they entered. Thus the 'equilibrium' price level in a sector characterised by concentrated oligopoly corresponds to the profit margin, after recouping the production costs, that exceeds the competitive level to the extent made possible by the height of the barrier to new firms entering the sector. In turn, the height of the barrier to entry depends on the fall in price that would follow upon the entry of a new firm, hence, in a first approximation, on the productive capacity of the new plant in relation to the dimensions of the market and the elasticity of price to increases in demand.

It is here that the line followed by Sylos Labini in his analysis of oligopoly departs from the static approach of marginalist equilibrium between demand and supply, and becomes incomprehensible for Modigliani, who attempts to bring the new theory back in line with the traditional approach in his review, and in the comments in his letter. There are two particularly significant aspects to this point: the use of what Sylos Labini (1957, p. 47) calls "empirical elasticity of demand"

(Bain, 1956) and is also considered by Modigliani in his review (Modigliani, 1958). In this respect it is worth noting that the case of product differentiation recalls more closely the traditional theory of imperfect competition (Sraffa, 1926; Chamberlin, 1933; Robinson, 1933), while the case of concentrated oligopoly is distinctly distant from it, in so far as it relies on the assumption of product homogeneity among the various firms belonging to the same sector.

and, above all, the reference to the market growth rate. In both cases we see the temporal dimension coming into play.

The elasticity that Sylos Labini considers is not that which would be derived from the static demand function, given by the ratio between the percentage changes in quantity and price (with a negative sign, since the two changes are in opposite directions), $-(dx/x)/(dp/p)$, but the empirical elasticity given by the ratio between total sales before and after the entry of the new firm into the sector. This definition dispenses with any reference to a static demand function and highlights the fact that the elasticity refers to a certain span of time, making way to include the rate of market growth among the variables determining the equilibrium price in the oligopoly. (Obviously, a higher growth rate corresponds to a lower price, inasmuch as it takes a shorter period of time for the quantity produced by the new plant to find an outlet at the old prices before entry, thereby limiting the losses caused by the entry itself).

Thanks to explicitly taking into consideration the importance of the temporal element, Sylos Labini's model remains indeterminate; indeed, as we know, price elasticity generally diminishes with an increase in the period of time considered, a longer span of time leaving greater scope for practices in consumption and production techniques to adjust. As for the rate of market growth, this is a variable of crucial importance: if, for example, we consider the case of a sector where there is room for five plants, with (static) unit elasticity the entry of a new plant would lead to a 20% fall in price; however, this reduction can be absorbed in the space of just one year if the annual growth rate in the sector is also 20%, or 10 years at a rate of 2%. The new entrant may be quite happy to bear even a considerable loss if it is concentrated in time for the sake of finding itself in a sector that guarantees a higher rate of profit than one under conditions of competition.

Sylos Labini's choice to take into account the non-static nature of the real world means foregoing construction of a deterministic model in favour of an 'open' model that does not give precise answers but simply highlights the factors relevant to the issue under examination. Indeed, this is a choice that Sylos Labini systematically made throughout his research activity.[17] At the same time, however, it is a choice that proves alien to the mentality of the marginalist economist, who deems it necessary to construct deterministic models while flexibility is left to a subsequent stage, when the model is being used in the interpretation of concrete realities.

The same problem emerges in relation to another aspect of Sylos Labini's theory of oligopoly, namely the assumption that the arrival of a new entrant is not followed by accommodating behaviour on the part of the firms already operating in the market, who maintain the same levels of production as before and accepting the fall in price (and profit) that follows. Modigliani stresses the importance of this assumption for Sylos Labini's theory, christening it "Sylos's postulate" (Modigliani, 1958, p. 217). He sees it not as necessitated but as an alternative to other possible assumptions, such as accommodating behaviour, with the firms already in the market accepting the reduction in their sales necessary to make room for the new entrant, leaving the price unchanged, or behaviour that we might call collusive (and which Modigliani seems to consider likely in his letter), with a sacrifice in shares in production equal for all, including the new entrant.

"Sylos's postulate" was to become widely debated, especially when the analytic tools of game theory (already mentioned by Modigliani in his letter) began to find wider circulation within the field of the theory of the firm. Critics of the postulate argue that, once a new market entry comes on the scene, it is in the interests of the 'old' firms to reduce their production pro rata to make room for the new entrant rather than suffer the price reduction that would result from non-accommodating behaviour. The immediate answer is that if the existing firms did not show a willingness to bear the cost to keep the new entries away, the first new entry would be followed by others until the rate of profit of all the firms came down to a level normal in competition. In turn, this argument was criticised on the grounds of the so-called 'chainstore paradox' in the

[17] See for instance the decidedly dynamic setting of his econometric model (Sylos Labini, 1967) or his analyses of the issues of income distribution (Sylos Labini, 1979) and employment (Sylos Labini, 1987).

theory of repeated games:[18] with a finite number of repetitions of the game (in our case, of new entries), the expediency of keeping up a reputation of hostility to new entries does not apply in the case of the last entry, which is greeted, therefore, with accommodating behaviour. However, this makes it useless to defend the reputation in the case of the penultimate entry, and again behaviour will be duly accommodating, and so on right back to the first entry. And yet this argument, too, loses validity in the case of an infinite number of repetitions of the game, or – perhaps more to the point here – of an indeterminate number, if there is no knowing when the game will come to an end.[19]

These discussions took place over a decade on from the time of Modigliani's letter, but his doubts about 'Sylos's postulate' were always rebuffed by Sylos Labini himself. The so-called postulate was, from his point of view, certainly not an assumption introduced into the theoretical argument to obtain the desired results, but the fruit of observation of the behaviour normally adopted by the big oligopolistic firms and based on rational criteria. Indeed, the 'reputation' conducive to a hostile attitude towards new market entries has an important role to play in the strategies of oligopolistic firms. As Modigliani himself points out,[20] accommodating behaviour leads to the total disappearance of oligopolistic extra-profits, though it is hard to see how the situation that Modigliani deems most likely may actually come about, with an equal reduction for all the market shares that could only be achieved with collusive behaviour involving both the new entry and all the old firms, blatantly breaching anti-trust norms. (Modigliani recalls such norms in his letter when hinting at the interest larger firms have to leave smaller and less competitive firms be, in order not to be accused of monopolising the market).

[18] Selten (1978).
[19] For an outline of the various aspects of the matter considered here, see Rasmusen (1989), pp. 85 ff.
[20] Following upon Stigler (1947).

5. How two different theoretical approaches can live together with a political alliance

As Rancan (2014) recalls, at the time the letter was written the two economists had long been close friends, sharing a progressive political position based on secular principles that had led them, in 1949, to propose to Gaetano Salvemini the launch of a journal in support of economic and social reforms in Italy. Despite their theoretical differences, which we consider in the present paper, this friendship and political affinity would endure throughout their lives, with initiatives like the "An Economists' Manifesto on Unemployment in the European Union" published in this journal (Modigliani *et al.*, 1998a, and in Italian in our sister journal, Modigliani *et al.*, 1998b: a text that has lost none of its relevance) and the joint endorsement of appeals criticising or questioning the legality of Silvio Berlusconi's policies.

On some occasions, as in the debate on the single point in the sliding wage scale,[21] introduced in 1975, their theoretical differences resulted in different emphases, but always in the interest of a common political objective, namely the abolition of the mechanism, pursued with articles and interviews in the press and meetings with those responsible for economic policy. Given the importance of this objective and the difficulty in pursuing it in the face of hostility from the PCI and the CGIL (respectively the major political party and trade union of the left), the difference in emphasis receded to the point of becoming imperceptible to the larger public, but it was always there, and in a different situation (if there had been the possibility to abolish the single-point mechanism through a strategy of compromise between the opposing sides) it could have acquired relevance. The episode is worth illustrating, albeit in brief outline.

[21] According to this mechanism, a one percentage point increase in the cost of living automatically gave rise to an increase in all money wages equal to one percent of the average wage. This meant a higher percentage increase for wages below the average and a lower percentage increase for wages above the average, hence leading to an automatic reduction of wage differentials while the average real wage remained constant.

Modigliani's opposition to the single-point mechanism (see Modigliani and Padoa-Schioppa, 1977) was due to the real wage downward rigidity that it entailed, for it offered full coverage against inflation for the average wage and prevented the neoclassical mechanism of unemployment absorption from functioning. From this point of view, the flattening out of wage differentials (as indicated in the footnote above, the single point meant an increase higher than inflation for wages below the average, and lower for wages above it) could be considered a secondary problem.

For Sylos Labini, on the other hand, the downward rigidity of the average real wage did not necessarily constitute a problem, for increases in productivity could still guarantee the international competitiveness of the Italian economy. Rather, the main problem lay precisely in the flattening out of wage differentials, which, with the particularly high inflation subsequent to the oil crisis of 1973-1974 and the later 1979-1980 crisis, was coming about at excessively rapid rates, generating far from negligible social tensions, with negative effects hitting productivity itself (and a dangerous rift within the progressive political camp,[22] given the conflict of interests between the lower skilled workers, whose wages grew automatically in real terms, and the higher skilled and white-collar workers, whose purchasing power was declining at alarming rates).[23]

As we have seen, this contrast could emerge only in the concrete proposals to supersede the single point, and not, therefore, in a situation of ideological confrontation between critics and supporters of the sliding scale, and moreover not in an atmosphere poisoned by the terrorism of the Red Brigades. Nevertheless, the differences existed. For example, while Modigliani focused attention on average real wage rigidity, as

[22] The importance of an alliance between the middle class and workers for the progressive political camp is a theme developed by Sylos Labini (1974).

[23] Consider a simple numerical example: for a wage twice the average, the single point of the sliding scale covers only half the inflation; with an inflation rate of 18%, the wage falls by 9% per year in real terms. Nor is there much room to recoup this through wage increases, given that the average cost of labour for the firms in monetary terms increases automatically at the same rate as the rate of inflation. The tax drift, i.e. the fact that nominal increases in wages led to more than proportional increases in taxation, further aggravated the problem.

pointed out above, the concrete proposals that Sylos Labini advocated (through the press, in some cases, but mainly in private conversations with political leaders of the CGIL and PCI, including Lama and Berlinguer) focused on a return to wage adjustments differentiated by income brackets, together with a limited reduction in the degree of coverage of the average wage, which could be offset by other measures favouring the less well off strata of the population.[24]

6. Exemplary collaboration, but with some limitations

Through – broadly speaking – political initiatives and debate on economic policy, on various significant occasions Modigliani and Sylos Labini came together to collaborate in pursuit of common objectives. As for scientific discussion, their reciprocal respect is evident, but evident, too, are the differences, which may seem less radical than they actually were thanks to the long-standing friendship between the two economists and the capacity shown by both to take up the appropriate opportunities

[24] See for instance some of the articles Sylos Labini published in the daily newspaper *la Repubblica*: "La sola via d'uscita: tassare e fiscalizzare" (29.10.1976, p. 6), "Si può evitare lo sviluppo 'zero'?" (10.12.1976, p. 6), "Svalutare non serve" (20.5.1980, p. 6), "Quando Agnelli insieme a Lama…" (21.1.1981), "Diminuiamo le tariffe pubbliche" (7.4.1981, p. 3), "Un esercito del lavoro" (22.12.1981, p. 6). See also Sylos Labini *et al.* (1978). Sylos Labini's proposals included a housing policy (social housing), a tariff policy for public transport and a reduction in pension and social insurance contributions from wages. On various occasions Sylos Labini involved me in some statistical exercise in support of these proposals. As regards the theoretical discussion, I became involved when, in 1977, Modigliani and Padoa Schioppa published (again in this journal) their celebrated critique of the mechanism for full coverage of inflation. When the article came out, Sylos Labini was in hospital for an eye operation, and dictated to me – talking it over at length, as was his wont – a letter to Modigliani in which he criticised the central assumption in that article, namely adoption of an increasing proportional margin of price on cost as the quantity produced increases; essentially, this takes us back to the traditional marginalist hypothesis of an inverse relation between real wages and employment. (The letter, a copy of which I still have, also contained an answer to a previous letter from Modigliani with comments on the article that Sylos Labini was to subsequently publish in the *Journal of Post Keynesian Economics*, Sylos Labini, 1979). Those discussions with Sylos Labini led me to intervene in the debate on the article by Modigliani and Padoa Schioppa: together with Mario Tonveronachi, we prepared a contribution criticising the neoclassical bases of that article (Roncaglia and Tonveronachi, 1978).

for academic and political collaboration. Basically, the letter we publish here is itself the fruit, as, at least in part, is his 1958 review of *Oligopolio e Progresso Tecnico*, of Modigliani's intention to give his friend a hand in the competition for an academic appointment.[25] However, there is also an evident asymmetry: while Sylos Labini was able to appreciate, albeit dissentingly, the logic of Modigliani's position (already established before the two met, see Modigliani, 1944), the reverse was not true.

Thus we can learn a threefold lesson from this story. First, discussion involving theoretical positions associated with different traditions – classical and marginalist, for example – is not necessarily a dialogue of the deaf, but implies reciprocal knowledge of the bases of the other approach (as well as reciprocal respect, of course), and thus that knowledge of the conceptual foundations that is acquired through study of the history of thought.[26] In this case, in the exchange between the two friends we see the better understanding Sylos Labini has of the foundations of Modigliani's position, deriving from his appreciation of the differences between the marginalist (or static equilibrium) and classical (dynamic) approaches.[27]

Secondly, when it is not a dialogue of the deaf, comparison between different approaches is extremely useful. In fact, it forces the distinction between inconsistencies within the lines of reasoning (and in so doing allows them to be eliminated, with thanks to whoever exposes them) and differences due to the distinct approach, bringing further light to bear on it. For example, looming behind the discussion between Modigliani and Sylos Labini, albeit in the shadows, is the distinction between the closed

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[25] Sylos Labini had to reckon with the opposition of Papi, who had formally been supervisor for his graduate thesis (in practice, it was supervised by Masci until his untimely death) and was intolerant of the independence enjoyed by one supposed to have been a pupil of his. Sylos Labini was therefore postponed to far less qualified candidates on the occasion of his first competition for an academic post, and so he had no choice but to continue working as a librarian at the Ministry of Agriculture, in the library which now bears his name. In the second competition the external support of such an authoritative economist as Modigliani and, in Italy, of a friend already holding a chair, Siro Lombardini, got the better of Papi's opposition.

[26] For a fuller treatment of this topic, see Roncaglia (2014).

[27] See for instance the discussion, already recalled above, on marginal cost at the point of full utilisation of productive capacity.

model (Modigliani's aim in proposing his reinterpretation of Sylos's theory of oligopoly, as characteristic of the marginalist approach) and the open model, characteristic of the classical approach insofar as it corresponds to recognition of the need for economic theory to 'open out to history'.

Thirdly, in the debate between 'economic systems' it is also a mistake to bring in overtones of ideological confrontation. Classical economists cannot be identified with Marx alone, nor marginalists solely with Friedman. Without drawing up a list (which would be very long) of 'marginalists of the left' or 'classical economists of the right', it must be recognised that there is an independence (relative, but always fairly ample) between an 'economic viewpoint' and a 'political viewpoint': in practice, the two intersect in every thinking mind, but with no necessary link between them. Affinity between political positions, which helps free discussion from ideological overtones, goes a long way towards favouring a useful debate between the various different economic approaches. This is evident in the case of Modigliani and Sylos Labini, and to some extent at least offset the incomprehension deriving from the radical differences between their respective theoretical approaches. (In the same way, obviously, theoretical-methodological affinity may favour an understanding of differences in political views and, in the case of 'closed' models such as those of the neoclassical-marginalist approach, also allow some unexpected convergences in the policy debate).[28]

More than the opportunities for collaboration in the political field, which, as we have seen, were taken up in the cases mentioned above, what needs to be emphasised here is the possibility for the open meeting of minds in the academic sphere, allowing for both collaboration and disagreement. In this respect it is essential to avoid ideological confrontation (in the worst sense of the word), thereby also avoiding rigid alignments that often condition comparative evaluations. A marginalist like Modigliani can give a helping hand to the academic career of a colleague whose qualities he recognises (or, many years later, propose his

[28] We may refer for instance to the debate surrounding the 'reforms' of the labour market aimed at increasing its 'flexibility'.

candidature for the Nobel Prize).[29] And at the same time – I mention it because I have direct knowledge of the facts – Sylos Labini can welcome to his institute as assistant a pupil of Modigliani, keenly committed to the mainstream approach, or turn down the recommendations of his friend favouring a candidate for an academic post, not on account of a different approach but for the simple reason he had authored too few articles, almost all in collaboration. In this respect, too, the debate between Modigliani and Sylos Labini exemplified by the document we publish in this issue constitutes a case of exemplary interest.

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