CHAPTER 18

# An Outline of a Keynesian-Sraffian Macroeconomics

*Jan Kregel and Alessandro Roncaglia*

## 18.1 Introduction

This chapter explores some similarities in the approach employed by Keynes and Sraffa to challenge the dominant economic theory of their time. Both challenged an existing neoclassical explanation of price determination: Keynes the explanation of the price level via the quantity of money and Sraffa the Marshallian microeconomic theory of supply and demand. Keynes formulated a 'monetary theory of production'[1] that eventually led him to propose a liquidity preference theory of financial asset prices, while Sraffa produced a theory of prices based on the production of commodities by means of commodities as a prelude to a critique of economic theory.

J. Kregel
Levy Economics Institute of Bard College, Annandale-on-Hudson, NY, USA
e-mail: kregel@levy.org

A. Roncaglia (✉)
University of Rome La Sapienza, Rome, Italy
e-mail: alessandro.roncaglia@uniroma1.it



M. C. Marcuzzo et al. (eds.), *New Perspectives on Political Economy and Its History*, Palgrave Studies in the History of Economic Thought,
https://doi.org/10.1007/978-3-030-42925-6_18

Both approaches thus differ from traditional neoclassical approaches in that they consider the role of prices in establishing equilibrium in production rather than exchange. And in this sense both may be considered as a reversion to the concerns of the Classical economists. In addition, both give a central role to the rate of interest in determining equilibrium in the system, Keynes rejecting the idea of a natural or real rate of interest determined by conditions of production, instead arguing that it is endogenously determined by asset preferences subject to policy decisions of the central bank, while Sraffa rejects the productivity determination of the rate of profits, also hinting to monetary influences on income distribution through a monetary determination of the rate of interest.

These similarities suggest that rather than being diametrically opposed, a fruitful symbiosis of the two approaches would lead to a better understanding of the operation of the economy in which we live. This contribution will focus on the similarity in the analytical methods employed in both approaches. We may simplify by noting that this method consists in isolating for analysis a specific objective and identifying the most important specific elements relevant for the problem under consideration, leaving aside complicating factors that have little impact on the final result. This approach allows for compatibility between the analysis of different issues, whenever the underlying conceptual framework (the general vision of the working of the economy) is, or can be considered to be, unique.[2] The existence of a common method at the basis of the theoretical work of the two economists provides an additional element in favour of the joint consideration of the approach of the two authors.

It is important to note that a number of economists of diverse formation have engaged in identifying and amplifying these similarities as the basis for a more general approach to economic analysis. In particular, contributions to the history of economic thought such as Annalisa Rosselli's are most useful, indeed necessary, for the reconstruction and specification of the set of concepts that constitute a common methodological approach or 'vision', which Schumpeter considered a vitally important stage of theorizing in economics.

The chapter is structured as follows. In Sect. 18.2, we illustrate our methodological standpoint. It combines two elements. First, there is the need for conceptual consistency of how a 'monetary production economy' works, requiring much greater attention than that implicit in the simple list of assumptions usually prefixed to theoretical models. Second, the

requirement for strict internal analytical consistency in theoretical contributions implies the need of well-specified separate theories dealing with different issues.

In Sect. 18.3, we sketch the main elements of the general vision, namely, the Classical 'circular-flow' approach, and we recall the 'photograph' interpretation of Sraffa's analysis of prices and their relationship with income distribution between wages and profits. Then the structure of Keynes's theory is discussed in Sect. 18.4. Our (provisional) conclusions are sketched in Sect. 18.5.

## 18.2 Method: The House and the Bricks

The two basic methodological requirements for a theory to be useful in interpreting reality are what Paolo Sylos Labini used to call the two 'R's: Rigour, namely internal logical consistency, and Relevance (or Realism), namely the reference to the actual conditions of the world in which we live, not to some imaginary mental construction which meets the theoretician's dreams for clear analytical results.

There is no need to dwell on internal logical consistency. Some additional considerations are instead necessary for the second 'R'. As Friedman (1953) intimated, barring a one-to-one replication of reality (which by the way, following the Sraffa-Wittgenstein debate recalled below, we consider to be impossible), no theory can be fully realistic: some simplification is unavoidable. We also agree with Friedman that the simpler a model is, the better, the ideal being a model that explains while focusing attention on very few elements.

Nonetheless, we must depart from Friedman's idea that the model should be accepted or rejected on the basis of its ability to forecast the future; ceteris paribus never rules in practice so it is impossible to differentiate changes in initial conditions from failures in the theory underlying the predictions. Friedman and his allies have always referred to the variations in actual economic events (what Marx, defending his own 'laws', christened 'counter-tendencies') to explain forecasting failures. If we have to rely on prediction failure to refute a theory, as in Lakatos's (1978) delineation of research programmes, the decision will depend on the subjective assessment of how large the failure must be (how much is enough?), so that we are led to Feyerabend's (1975) method of rhetorical debate (of which Adam Smith [1795], was a forerunner).[3]

In fact, Friedman's test more than anything else served a (misleading) rhetorical purpose in resolving first, in the early 1950s, a conundrum raised by what appeared to be non-rational behaviour contradicting the rationality assumption of the new von Neumann-Morgenstern-Savage microeconomics; then, in the early 1970s, a supposedly similar conundrum raised by stagflation to neo-Keynesian fine-tuning policy: inflation was to be confronted with restrictive demand policy while unemployment required expansion of demand.[4] The Phillips curve appeared to provide policy-makers with a menu of policy choices between inflation and unemployment, but it proved to be impossible to evaluate policy results based on the Phillips curve since the NAIRU, the unemployment rate which was presumed to be compatible with stable prices, was continually revised (upwards) and error attributed to the statistical identification of the slope and position of the curve. Eventually, the expectations augmented curve led to the specification of a vertical curve in which there was no longer any trade off and policy to reduce unemployment would only produce inflation.

In simplifying reality, theory can adopt two complementary strategies (or, perhaps, two faces of the same strategy): the Weberian method of ideal types (Weber [1920–21], in many ways equivalent to the Kaldorian method of stylized facts, cf. Kaldor [1957]), and preservation—if not directly, at least as potential compatibility—of the main characteristics of the real-world object of our enquiries. In economics, this means simplifications that do not contradict the fact that we refer to a world: (i) where the division of labour prevails, (ii) where there are many commodities (more precisely: various basic commodities, namely commodities directly or indirectly utilized in all processes of production) so that perfect substitution in production and consumption does not exist, (iii) in which continuous change leads to uncertainty over future outcomes, (iv) a market institutional set-up prevails open to private ownership of means of production, and (v) a variety of agents holds a variety of opinions. As we shall see, these are the five basic characteristics of the real world that are present in both the Keynesian and Sraffian viewpoints.

This approach to simplification implies that each theoretical issue under investigation may involve the choice of a different set of the most relevant simplifying assumptions. Each separate specification will then provide 'building blocks' or 'analytical bricks' that, when considered together, may provide a theoretical structure for analysing the functioning of the economy.

In this regard, a model of aggregate income (such as Harrod's dynamic theory) does not necessarily contradict this general 'vision', when it aims at results (the instability of the warranted growth path) and provides results that will carry, though in a more complex form, in a multi-sectoral economy. In contrast, the trade-off between real wage rate and unemployment in a one sector model does not produce results that apply to a multi-commodity world. Analogously, the Sraffian analysis of the relationship between prices and income distribution does not contradict the presence of uncertainty in the real world, because it refers to a 'photograph' of the economy at a point in time and does not try to explain those phenomena—such as the rate of interest, or investments—where uncertainty is directly relevant, nor how uncertainty may influence the evolution of these variables over time. So a theory such as Fama's (1970) on efficient financial markets cannot be considered of general application since its results depend on exclusion of (Keynesian-type) uncertainty. Division of labour in a capitalist society implies the presence of conflicts (and alliances) of interests, requiring abandonment of the abstract notion of the 'representative agent' (that, in modern macroeconomics, is analytically equivalent to the one-commodity assumption).

Construction of a general theory/model representing economic reality in all its aspects is impossible. The very outcome of the research programme of general economic equilibrium testifies to this: multiple equilibria and instability void the model of useful results and call into question the relevance of its conceptual foundations (equilibrium prices determined by demand and supply, convex preference and production sets, absence of uncertainty).

The idea of a full axiomatization of the economy (along the lines of the Bourbaki ideal of axiomatization in mathematics) relies on something similar to Wittgenstein's original ideas in the *Tractatus* ([1921] 1922): a system of propositions, simple and complex, representing the world—with the exception of the 'unspeakable': religious convictions, aesthetic judgements et similia. This idea was abandoned by Wittgenstein, in the wake of Sraffa's criticisms to it.

An alternative way is suggested by Wittgenstein himself in his posthumous book on *Philosophical Investigations* (1953) pointing to the possibility of constructing 'word games', where the same word may acquire different meanings in different contexts. Each 'word game' can usefully represent an aspect of reality; producing a unique theory of different 'word games' is nonsensical, since as just recalled the terms acquire somewhat

different meanings within different games. In our view, while no general theory is possible, it is possible to add up different word games in a loosely identified commonly understood language: in our context, a 'view', or approach, unified by the reference to a common conceptual representation of reality.[5]

In other terms, we may conceive of individual components or 'analytical bricks' each dealing with a well-specified issue and thus relying on a set of specific assumptions, with such assumptions chosen in such a way as to be conceptually compatible with an underlying vision of the working of the economy, so that the different bricks can contribute to a theoretical building, though not adding up to a unique general analytical structure.

Keynes points in a similar direction in his *Treatise on Probability*, with his 'theory of groups'.[6] Confronted with the substantial differences in the confidence we may have in our evaluation of the situation when confronted with different kinds of decisions, Keynes proposes the application of the mathematics of probability (or, we may suggest by extension, theoretical reasoning) separately to issues of the same kind, namely to which a similar level of confidence may be applied.

More specifically, Keynes provides a logical specification of a 'group' as a set of propositions, a sub-set of which constitutes the 'premises' (independent of each other), while all other propositions are logically derivable from the premises. When applied to economics, this method implies specification of the premises on the basis of the requirements set out above. Thus, in a way, 'groups' may be considered as a forerunner of the proposed individual components or 'bricks'.

More generally, Keynes suggests such a versatile method when he says

> The division of the determinants of the economic system into the two groups of given factors and independent variables is, of course, quite arbitrary from any absolute standpoint. The division must be made entirely on the basis of experience, so as to correspond on the one hand to the factors in which the changes seem to be so slow or so little relevant as to have only a small and comparatively negligible short-term influence on our quaesitum; and on the other hand to those factors in which the changes are found in practice to exercise a dominant influence on our quaesitum. ([1936] 1973, p. 247; cf. 1973a, pp. 481–483)

This division will thus be different for every specific aspect of the system that is under investigation. Thus, economics is a science—the need for

logical consistency is essential, and in the realm of the analysis of concepts the philological method of analysis of text and context also provides a scientific foundation for distinguishing what is scientifically acceptable from what is not—but it is also an art, requiring historical, social and human sensibility. (Again, we should add that in choosing the relevant theories the economist should look at their internal consistency and their compatibility with the main characteristics of the economic world in which we live—those indicated above.)

In other terms, we have a conceptual representation of the working of a monetary production economy—and a set analytical results, or bricks which provide its foundation. Two of such bricks are recalled below: Sraffa's analysis of the relationship between prices of production and income distribution, and Keynes's analysis of output and employment.

## 18.3 Sraffa's Photograph

The 'vision' of the monetary production economy, as we conceive it, has been built gradually over centuries. It relies on the Classical ('surplus', 'circular flow') approach, adding to it the Keynesian notion of uncertainty, the corresponding notion of liquidity and the corresponding interpretation of the way financial factors affect the economy.

Traditionally, the Classical approach is presented by contrasting it to the marginalist (or 'neoclassical') one. Sraffa (1960, p. 93) speaks of 'circular flow of production and consumption' in contrast to the 'one-way avenue' leading from scarce resources to the satisfaction of economic agents' needs and desires. Within the Classical approach, economics (or, as the Classical authors used to call it, political economy) studies the conditions of society's economic reproduction and development; the marginalist approach instead focuses on the conditions of optimal utilization of the scarce resource available. This difference in approach has multiple implications.

First, the 'circular flow' (or 'spiral', as Sylos Labini [1985] prefers to call it, since the point of arrival of the cycle is different from the point of departure) is intrinsically dynamic, representing processes that take place in time. Essentially, in an economy based on the division of labour, each productive unit at the end of the production period obtains a certain quantity of products, that is usually of greater value than the means of production employed, but consists in a different bundle of commodities; thus, it needs to enter into relations of exchange with other productive

units for obtaining the means of production (and the means of subsistence for its workers) so as to start a new production process. Thus the market is a web of exchange (and distributive) relations connecting the different sectors and productive units (while within the marginalist approach it is conceived as a point in time and space to which offers and demands converge, as in Medieval fairs or in today's stock exchange). Exchange ratios must be such as to ensure that each sector obtains what is necessary to repeat the production process, plus a profit incentive to renew it.

This view of the problem of value—namely, the determination of exchange ratios and distributive variables—is thus different from the marginalist (one-way avenue) approach. In the latter, each agent has an original endowment of resources, and has the problem of allocating it among different uses in such a way as to maximise utility, keeping into account the preferences (utility maps) for the different uses. The imperative of equilibrium between supply and demand implies full utilization of the available resources.

Also, within the Classical approach the decision to produce a certain amount of product precedes the production process, and this in turn precedes the 'realization' problem, namely that of selling the product on the market; this implies that the theoretical variable 'natural prices' has nothing to do with equality between supply and demand.

The presence of differing groups with conflicting interests on the distribution of the surplus product (social classes and social strata) implies that the distributive variables are 'socially embedded' magnitudes, where economic and political processes interact. Within the marginalist approach instead the distributive variables are simply the demand and supply determined prices of the 'factors of production'; thus, by implication, the equilibrium prices of the distributive variables thus conceived automatically ensure equality between quantity demanded and supplied of such factors of production, namely full employment of labour, land and capital. Such a full employment implication is absent from the Classical notion of a distributive variable.

Sraffa's (1960) contribution focuses on the analysis of the relationship connecting prices to income distribution between wages and profits. Its conceptual context is the Classical one just recalled above. Sraffa's aim is to solve the Classical problem of value, by rigorously delimiting it.[7] Sraffa's solution involves abandoning the labour theory of value, so as to keep into account the influence of distributive variables over prices:

an influence already recognized by Classical authors such as Ricardo or Marx, but without providing a satisfactory solution.

Following the Classical tradition, Sraffa distinguishes prices of production—the theoretical variable that is the object of analysis—from market prices, not considered theoretical variables. Also, Sraffa explicitly assumes production levels as given, so that no assumption about returns is necessary. This point is quite important, as shown by the fact that Sraffa repeats it three times in the Preface to his book. This means that his analysis refers to a given moment in time: a 'photograph', not a theory of long-run prices connected to a theory of short run prices identified with market prices, as in the Marshallian tradition, nor a theory of 'long period positions' acting as 'centres of gravitation' for market prices, as Garegnani and others have interpreted it.[8] In this way, the issue of value as tackled by Sraffa is kept separate from other issues, such as accumulation, technical change and development of the economy over time. The analysis focuses solely on the relationship between prices (interpreted as theoretical variables, hence 'natural' or 'production' prices, to be kept distinct from 'market prices', not considered as a theoretical variable) and distributive variables for a given set of output levels and a given state of technology.

Let us summarize Sraffa's analysis. When commodities are at one and the same time products and means of production, the price of one commodity cannot be determined independently of the others, nor the set of relative prices independently of income distribution between profits and wages. We must consider income distribution and the determination of relative prices simultaneously. The solution is thus provided by a set of equations, each one describing what happens in one of the sectors of production in which the economy is subdivided. Quantities of means of production and of labour employed in each sector, multiplied by their respective prices and by the wage rate, plus a rate of profits which is uniform in all sectors of the economy multiplied by the value of means of production employed in the sector, is equal to the value of the product, namely the quantity of the products multiplied by their respective prices. Once one of the distributive variables is exogenously given, and once a unit of measure has been chosen, the set of equations—as many as there are sectors in the economy—determines relative prices and the second distributive variable.

As far as distributive variables are concerned, at each point in time (hence, given the levels of production and the technology in use) there is

a given surplus (a multi-dimensional magnitude, represented by a vector of quantities indicating the surplus produce of the different commodities) to be distributed between the two social classes of capitalists and workers. Thus, one of the two variables is determined within Sraffa's system of equations, while the second one is determined as a consequence. This means that the distribution of the surplus between the two classes is not determined within the model: it is determined outside of it, in a historical-social-political context.[9]

Thus Sraffa's analysis, by focusing on given activity levels and a given technology in use, 'cuts out' all other issues different from the one under consideration. It is a perfect 'brick' to build our edifice: internally consistent, and conceptually compatible with the Classical approach (circular flow, market as a web of exchanges allowing reproduction of the economy, a uniform rate of profits corresponding to the Classical hypothesis of free competition meant as freedom of capitals to move from one sector to another), while open to a Keynesian solution for the determination of levels of output and employment and to the overarching influence of the financial sector over the real economy, income distribution included.

Sraffa himself points in the direction of the influence of finance on income distribution, referring to the influence of the interest rate on the profit rate: a not-well understood point in common with Keynes's approach which requires an interest rate to be set independently of the other rates of return on assets, and considers the action of the central bank in setting interest rates as an independent variable.

Other complications may also be quite easily introduced in the analysis. For instance, in the case of oligopolistic sectors, we might introduce multiplicative coefficients for the sectoral profit rates determined by the size of the barriers to competition. Equally, different qualifications can be easily recognized for labour. These are but other bricks, superimposed on the one that represents a founding pillar in our Classical-Keynesian approach.

## 18.4 Keynes's Restatement of the 'General' Theory of Employment

Though Keynes entitles his main work *The General Theory of Employment, Interest and Money*, it was certainly not intended to be a general theory in the sense that it encompasses all aspects of economic reality, as proposed in general equilibrium theory. In the Preface to the *General Theory*,

Keynes ([1936] 1973, p. xxii) defines his objective as 'primarily a study of the forces which determine changes in the scale of output and employment as a whole; …. We are thus led to a more general theory, which includes the Classical theory with which we are familiar, as a special case'.

As noted above, the choice of this particular problem to be analysed required the selection of variables to be classed as independent, given and dependent. 'Our present object is to discover what determines at any time the national income of a given economic system and (which is almost the same thing) the amount of its employment; which means in a study so complex as economics, in which we cannot hope to make completely accurate generalisations, the factors whose changes mainly determine our quaesitum'. And perhaps most importantly for the economist, 'Our final task might be to select those variables which can be deliberately controlled or managed by central authority in the kind of system in which we actually live' (Keynes [1936] 1973, p. 247; 1973a, p. 483). That is, to be able to formulate policy implications of the analysis.

In the case of the determination of the volume of employment and output he selected the following factors as having insufficient impact on the objective that they could be considered as given:

1. The existing skill and quantity of labour.
2. The existing quality and quantity of productive equipment.
3. The existing techniques of production.
4. The degree of competition.
5. The tastes and habits of consumers.
6. The disutility of different intensities of labour and activities of supervision and organization.

However, note that, while these factors are considered as given, this did not imply that they could be considered as constant or unchanging, but that the effect and consequences of changes in them were not sufficiently important to be taken into consideration. These given factors then 'influence our independent variables, but do not completely determine them' (Keynes [1936] 1973, pp. 245–246).

The independent variables that Keynes proposes are the three 'psychological' or behavioural relations: the propensity to consume, the marginal efficiency of capital and liquidity preference. In addition, Keynes considers behavioural factors which are determined by other actors in the economy

and thus also independent: the wage unit and the quantity of money as determined by the central bank.

But, Keynes notes in the Preface quoted above ([1936] 1973, p. xxii) that 'A monetary economy, we shall find, is essentially one in which changing views about the future are capable of influencing the quantity of employment and not merely its direction'. Since the three 'psychological' variables are classified as 'independent', it is clear that they will be mostly influenced by individual expectations. Yet, what Keynes calls the 'state of expectations' is not present in the independent variables listed above. In this regard, Keynes employs a variation in the degree of 'independence' assigned to expectations.

He first notes that the impact of changing expectations might better be differentiated for decisions concerning investment, consumption and portfolio choice. In general, he considers the impact of expectations on the consumption function to be of minimal significance and thus best considered amongst the givens, while they are of much greater significance for production decisions, capital investment decisions and portfolio choice. For production decisions, Keynes notes following Marshall that short-period expectations will dominate, while for capital investment decisions long-term expectations will be crucial. Finally, as Richard Kahn (1972) and Joan Robinson (1952) were to subsequently explicate, for widows and orphans subject to income risk, long-term expectations would be more important while for money market traders, subject to price risk, short-term expectations would be more important.

> Having, however, made clear the part played by expectations in the economic nexus and the reaction of realised results on future expectations, it will then be safe for us in what follows often to discard express reference to expectations. It is important to make the logical point clear and to define the terminology precisely so that it will apply without ambiguity in all cases. (Keynes 1973b, p. 397)

The assumption thus meant keeping at the back of our minds that 'we shall not in any way be precluded from regarding the propensity itself as subject to change' (Keynes 1973a, p. 440) due to a change in general expectations when analysing the real world.

The relative importance of long- and short-period expectations is thus given varying weight in discussion of various elements of the independent

variables in the *General Theory*. It is possible to provide a general summary of three classes of analysis of the influence of expectations on the independent variables of the *General Theory* via three informal models (cf. Kregel 1976). In comments written after the publication of the book Keynes alludes in 1937 to what may be called a model of static equilibrium in which the state of general expectations is given and constant, supported by individual short-period expectations that are confirmed. The theory of effective demand could thus be set out without reference to comparison of ex-ante or ex-post expectations nor the assumption of perfect certainty.

In a stationary equilibrium the state of general expectations remains constant, but the now admitted possibility of present disappointment would have no effect on long-period expectations. This is the model that Keynes implicitly assumes in the first 18 chapters of the *General Theory* where he notes that it is possible to 'disregard express reference' to the impact of expectations since they function as givens for the analysis of the principle of effective demand.

Finally, it is possible to discern a model of 'shifting equilibrium', where current disappointment affects the state of general expectations and thus the independent individual expectational functions are free to shift over time and will normally be disappointed. This is the model that corresponds to his reference to 'changing ideas' about the future becoming crucially important, noting that 'it is not the economy under observation which is moving in the one case and stationary in the other, but our expectations of the future environment which are shifting in one case and stationary in the other' (Keynes 1973b, p. 511). In the *General Theory* (Keynes [1936] 1973, p. 293) Keynes also refers to this 'line of division between the theory of stationary equilibrium and the theory of shifting equilibrium—meaning by the latter the theory of a system in which changing views about the future are capable of influencing the present situation'.

The extreme complexity of such a situation shows the advantage of the approach of specifying the objective of analysis by choice of independent and given variables.

Note that there is correspondence between Keynes's stationary model and the assumption of 'tranquil conditions' made by Joan Robinson (1952) in her analysis of growth and distribution. It seems obvious that the study of growth and capital accumulation, for example, requires productive capacity to become a dependent variable instead of being given:

liquidity preference may become a datum as well as the propensity to consume. Population must be assumed to be constant or growing in a specified manner. The independent variable is then the marginal efficiency of capital or 'animal spirits'. One can then analyse the system with a stationary equilibrium approach, by looking at the effect of two different given constant levels of expectations on the rate of change of the quantity of productive equipment. Likewise the direct analyses of distribution, technical progress, the determination of prices and mark-ups would require their own particular divisions of the determinants of the economic system.

## 18.5 Provisional Conclusions

In this chapter, we have illustrated a method of theory construction—'analytical bricks' connected in a common conceptual framework—indirectly suggested, though in different ways, by both Keynes and Sraffa. We have then shown that this method is employed by these two authors. These analyses can thus be interpreted as two foundational bricks for an evolving reconstruction of economics along Classical-Keynesian-Sraffian lines.

We might recall here a number of examples of bricks, quite different in nature, but conceptually compatible with a Keynes-Sraffa approach. First, Harrod's (1939) model defining the warranted rate of growth, interpreted as extending to dynamics the instability problem of non-convergence to a full employment equilibrium path, or indeed to any stable share of employment on population. Second, Minsky's (1975, 1982, 1986) analysis of financial fragility, as well as his notion of money manager capitalism. Third, Sylos Labini's (1956) analysis of oligopoly (interpreted as the general case of market forms, with free competition and monopoly as the limit boundaries characterized by a zero and an infinite barrier to entry). But the list may be quite long.

The field is wide, and we can only hope that young scholars will take on the task.

**Acknowledgements** Thanks for useful comments are due to Mario Tonveronachi and to an anonymous referee.

## Notes

1. As Keynes himself labels it, in the title of his autumn 1932 lecture course: cf. Keynes (1973a, p. 420).
2. The interpretations of Keynes's and Sraffa's analyses and of their connections presented here find their genesis in Kregel (1973, 1976, 1980), Roncaglia (1975, 2009a, b), Tonveronachi (1983, 1992), Roncaglia and Tonveronachi (2014).
3. On the history and nature of the method of rhetorical debate, cf. Roncaglia (2005, pp. 8–12, 118–120).
4. On Friedman's method, cf. Roncaglia (2019, § 8.5). On the history of the debate on the strict rationality assumption, cf. Heukelom (2014).
5. On Wittgenstein's change of views, and on Sraffa's influence on it, cf. Roncaglia (2009b, pp. 25–28), summarizing an interpretation already set out in Roncaglia (1975), for which he is greatly indebted to discussions with Piero Sraffa.
6. Cf. Keynes ([1921] 1973, Chapter 11, in particular, p. 134). The point is illustrated in Roncaglia (2009a).
7. Here, we do not consider Sraffa's second objective: providing the foundations for an internal criticism to the traditional marginalist theory of value and distribution. Nor do we consider a long-debated issue concerning the relevance, and compatibility with Sraffa, of an absolute notion of value connected to labour and hence to Marx's exploitation.
8. On this point and more generally for this interpretation of Sraffa's analysis, as well as for references to the 'long period'/'centres of gravity' interpretations, see Roncaglia (2009b).
9. See, for instance, Sylos Labini's analysis of income distribution (e.g. in Sylos Labini 1984).

## References

Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance, 25*(2), 383–417.

Feyerabend, P. (1975). *Against Method: Outline of an Anarchist Theory of Knowledge*. London: New Left Books.

Friedman, M. (1953). *Essays in Positive Economics*. Chicago: University of Chicago Press.

Harrod, R. (1939). An Essay in Dynamic Theory. *Economic Journal, 49*(193), 14–33.

Heukelom, F. (2014). *Behavioral Economics: A History*. Cambridge: Cambridge University Press.

Kahn, R. F. ([1954] 1972). Some Notes on Liquidity Preference. As reprinted in: *Essays on Employment and Growth* (pp. 72–96). Cambridge: Cambridge University Press.

Kaldor, N. (1957). A Model of Economic Growth. *Economic Journal, 67*(268), 591–624.

Keynes, J. M. ([1921] 1973). *Treatise on Probability*. As reprinted in: D. E. Moggridge & E. Johnson (Eds.), *The Collected Writings of John Maynard Keynes* (Vol. 8). London: Macmillan for the Royal Economic Society.

Keynes, J. M. ([1936] 1973). *The General Theory of Employment, Interest and Money*. As reprinted in: D. E. Moggridge & E. Johnson (Eds.), *The Collected Writings of John Maynard Keynes* (Vol. 7). London: Macmillan for the Royal Economic Society.

Keynes, J. M. (1973a). *The General Theory and After: Part 1. Preparation*. In D. E. Moggridge & E. Johnson (Eds.), *The Collected Writings of John Maynard Keynes* (Vol. 13). London: Macmillan for the Royal Economic Society.

Keynes, J. M. (1973b). *The General Theory and After: Part 2. Defence and Development*. In: D. E. Moggridge & E. Johnson (Eds.), *The Collected Writings of John Maynard Keynes* (Vol. 14). London: Macmillan for the Royal Economic Society.

Kregel, J. A. (1973). *The Reconstruction of Political Economy*. London: Macmillan.

Kregel, J. A. (1976). Economic Methodology in the Face of Uncertainty: The Modelling Methods of Keynes and the Post-Keynesians. *Economic Journal*, *86*(342), 209–225.

Kregel, J. A. (1980). Markets and Institutions as Features of a Capitalistic Production System. *Journal of Post Keynesian Economics, 3*(1), 32–48.

Lakatos, I. (1978). *The Methodology of Scientific Research Programmes: Philosophical Papers*. Cambridge: Cambridge University Press.

Minsky, H. P. (1975). *John Maynard Keynes*. New York: Columbia University Press.

Minsky, H. P. (1982). *Can 'It' Happen Again? Essays on Instability and Finance*. Armonk, NY: Sharpe.

Minsky, H. P. (1986). *Stabilizing an Unstable Economy*. New Haven: Yale University Press; new ed., New York: McGraw Hill, 2008.

Robinson, J. (1952). The Rate of Interest. In *The Rate of Interest and Other Essays*. London: Macmillan.

Roncaglia, A. (1975). *Sraffa e la teoria dei prezzi*. Roma–Bari: Laterza. English transl. *Sraffa and the Theory of Prices*. Chichester: Wiley, 1977.

Roncaglia, A. (2005). *The Wealth of Ideas*. Cambridge: Cambridge University Press.

Roncaglia, A. (2009a). Keynes and Probability: An Assessment. *European Journal of the History of Economic Thought, 16*(3), 489–510.

Roncaglia, A. (2009b). *Piero Sraffa*. Basingstoke: Palgrave Macmillan.
Roncaglia, A. (2019). *L'età della disgregazione. Storia del pensiero economico contemporaneo*. Bari–Roma: Laterza. English transl. *The Age of Fragmentation*. Cambridge: Cambridge University Press.
Roncaglia, A., & Tonveronachi, M. (2014). Post-Keynesian, Post-Sraffian Economics: An Outline. In D. Papadimitriou (Ed.), *Contributions to Economic Theory, Policy, Development and Finance: Essays in Honor of Jan A. Kregel* (pp. 40–64). Basingstoke: Palgrave Macmillan.
Smith, A. ([1795] 1980). *Essays on Philosophical Subjects*. In W. P. D. Wightman & J. C. Bryce (Eds.), *The Glasgow Edition of The Works and Correspondence of Adam Smith* (Vol. 3). Oxford: Oxford University Press.
Sraffa, P. (1960). *Production of Commodities by Means of Commodities*. Cambridge: Cambridge University Press.
Sylos Labini, P. (1956). *Oligopolio e progresso tecnico*. Milano: Giuffrè. English transl. *Oligopoly and Technical Progress*. Cambridge, MA: Harvard University Press, 1962.
Sylos Labini, P. (1984). *The Forces of Economic Growth and Decline*. Cambridge, MA: MIT Press.
Sylos Labini, P. (1985). La spirale e l'arco. *Economia Politica*, *2*(1), 3–11.
Tonveronachi, M. (1983). *J.M. Keynes. Dall'instabilità ciclica all'equilibrio di sottoccupazione*. Roma: NIS.
Tonveronachi, M. (1992). Keynes and Equilibrium: A Note. In M. Sebastiani (Ed.), *The Notion of Equilibrium in the Keynesian Theory* (pp. 18–31). London: Palgrave Macmillan.
Weber, M. (1920–21). *Gesammelte Aufsätze zur Religionssoziologie*. Tübingen: Mohr.
Wittgenstein, L. ([1921] 1922). Logisch-philosophische Abhandlung. *Annalen der Naturphilosophie, 14*, 185–262. Revised English edn., *Tractatus Logico-Philosophicus*. London: Kegan Paul.
Wittgenstein, L. (1953). *Philosophical Investigations*. Oxford: Basil Blackwell.