

Against the current: Sraffa's unpublished manuscripts and the history of economic thought*

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1. Sraffa's legacy in economics

There are two ways to contribute to the history of economic thought: by writing about other economists; or by obliging others to write about oneself. On both counts Piero Sraffa did exceptionally well, given the number of pages he published. Whatever he was prepared to have put in print had a deep and lasting impact on the profession. A foremost historian of economic thought of this century, Sraffa was not only interested in the history of our subject for its own sake. He rather conceived of a meticulous and critical study of earlier political economists, and of the interpretations of their works by later authors, as an indispensable task in the development of a coherent economic analysis of modern society. He was convinced that in order to promote economics one has to study the history of the subject as well as the history of the subject matter, that is, economic and social history.

As the twentieth century comes to a close, we can safely say that it has seen no other scholar who compares with Sraffa in terms of the challenge he put to the received interpretation of the history of economic thought. He successfully shattered the Marshallian view that that history was essentially a one-way avenue leading from primitive conceptualizations of the supply and demand approach to ever more sophisticated ones, merely leaving behind errors of reasoning and unnecessarily restrictive assumptions. Sraffa showed that there was an earlier theory, whose roots may in fact be traced back to the inception of political economy in the seventeenth century,

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which was fundamentally different from the marginalist one. This theory had been developed by Adam Smith and then David Ricardo, but shortly afterwards it was aborted prematurely. This led naturally to the following tasks which Sraffa set himself: (i) to provide evidence that there was a distinct classical theory; (ii) to reconstruct and develop that theory and demonstrate its explanatory power; and (iii) to show that the alternative marginalist theory was flawed.

Important elements of the classical theory of value and distribution were first clarified by Sraffa in his Introduction to Volume I of *The Works and Correspondence of David Ricardo* (Ricardo 1951–73) which he edited with the collaboration of Maurice H. Dobb (Sraffa 1951). A fully worked out formulation of that theory, covering a wide range of problems, was then put forward in *Production of Commodities by Means of Commodities* (Sraffa 1960). Apart from a few observations, the criticism of the marginalist theory is only implicit in the book; others rendered it explicit during the capital controversies in the 1960s and 1970s.

Sraffa began his (re)constructive and critical work in the late 1920s. He had to interrupt it twice, from the early 1930s to the early 1940s and from the mid 1940s to the mid 1950s, partly because the Ricardo edition required most of his attention. His unpublished papers and correspondence in the Wren Library at Trinity College, Cambridge, document in detail a lifetime's work: the problems he was concerned with, his method and style of work, the sources he used and the results he obtained. They also reveal his wider philosophical interests, intellectual fascinations and social passion. The publication of a selection from the enormous material, which comprises several thousand sheets and slips of paper and a number of notebooks, containing comments on the literature, sundry observations, statements of problems to be dealt with and ideas to be tried out, lecture notes, elaborations of concepts, early drafts etc., is currently being prepared.

The purpose of this note is to throw some new light on Sraffa's contribution, using material from his yet unpublished manuscripts. Attention will focus on the three tasks specified above. It hardly needs to be stressed that in so short a paper as this the breadth and depth of Sraffa's work cannot adequately be reflected. At most the richness and originality of Sraffa's theoretical and historical work can be illustrated by way of a few examples. Hopefully, this will excite the readers' interest and urge them to consult the sources for themselves. I shall begin with a few words on Sraffa's unpublished papers, followed by some broad remarks on his view of the evolution of economic theory. I shall then turn to his reconstruction of the classical approach, culminating in his 1960 book. Next Sraffa's attitude towards the labour theory of value will be touched upon, followed by some early criticisms of his of the concept of 'capital' in marginalist theory. I conclude with

a brief general assessment of Sraffa as a scholar and political man. Henceforth, with a few exceptions only Sraffa will be reported.

2. Sraffa's unpublished papers

Sraffa bequeathed his papers and correspondence (together with his precious library) to Trinity College. The material is not only huge, it is also very complex. Sraffa generally wrote for himself and apparently had no plans to publish the manuscripts. Many of the ideas he wrote down are bound to look cryptic to the reader, at least at first sight, because of a lack of knowledge of the implicit premisses underlying Sraffa's reasoning. And Sraffa is rightly known as someone who did not waste words. His style is terse; his texts cannot be criticized for being redundant. The majority of the manuscripts and notes are in Sraffa's hand. Fortunately, his handwriting is easy to read. Most of the material is in English, some in Italian and only a few pieces are in French or German. Since from an early stage Sraffa dated his manuscripts, we know in most cases precisely when he tackled which question, formulated which hypothesis and came up with which finding. It is fascinating to see that he anticipated several results of the later economics literature by many years, some even by decades. It is all the more regrettable that Sraffa was so reluctant to put the fruits of his work in print. His fastidiousness prevented him from publishing arguments as long as he had the slightest doubts about their correctness. He wanted to be absolutely sure that he had completely thought through the problem under consideration, taking into account each and every aspect relevant to its understanding, following through all its ramifications and thereby anticipating every objection that could possibly be raised.

The papers are kept in the Wren Library, Trinity College, Cambridge. After Sraffa's death his literary executor Pierangelo Garegnani and Krishna Bharadwaj prepared a detailed inventory of the material; they took care not to destroy the order of the papers as Sraffa had left them in 1982. Partly on the basis of their work Jonathan Smith, archivist of Wren Library, prepared a catalogue, which is the one currently in use. In the following all references to Sraffa's papers relate to this catalogue, first giving the signature of the file under consideration and, after a colon, the number of the sheet.

The papers are arranged in the following series: (A) Personal and family papers; (B) Academic career; (C) Correspondence; (D) Notes, lectures and publications; (E) Diaries; (F) Memoirs of colleagues; (G) Publications by others; (H) Bibliographical material; (I) Items removed from printed books; (J) Miscellaneous material. To the scholar interested in Sraffa's contributions to economics, series (D) is the most interesting; in addition

there is Sraffa's correspondence (C), including his exchange of letters with major economists. Series (D) is subdivided into: (D1) Notes; (D2) Lectures; and (D3) Publications.

There is a huge number of notes on various problems, ideas, concepts and doctrines. A few examples must suffice. There are a couple of notes and short manuscripts dealing with epistemological and methodological problems in economics: for instance, there are notes on 'Interdependence and causality', on 'Explanation and causality' and on 'Long and short periods'. Then there are discussions of particular concepts and problems. Several notes deal with the concept of 'Consumer surplus'. There is a large number of papers dedicated to the 'Laws of returns' and Marshall's analysis. We encounter all problems Sraffa was concerned with in his constructive and critical work, including the problem of the 'Standard and Cause of value' and that of 'Utility' and marginal productivity theory. Marshall's illustration of the latter in terms of the 'marginal shepherd' figures prominently in the early papers. A set of notes deal with the 'Necessity of interest', another one with Senior's concept of 'Abstinence'. Then there are Sraffa's comments on the *Treatise on Money*, his discussion of contributions by Wicksteed, Edgeworth and many others, etc. In short, there is a very rich material waiting to be explored in detail and prepared for publication.

As regards Sraffa's lectures on 'Advanced Theory of Value' given to students undertaking the economics tripos (1928–31), we are in the possession of a full manuscript containing a detailed account of the contents of the lectures and for the greater part also fully worked out arguments in regard to the themes dealt with (see D2/4). Sraffa analyses the development of the theory of value from its beginnings to his own time: he starts with Petty and the Physiocrats and ends with Marshall. According to Sraffa one way to look at the history of economic thought is in terms of changes in the concepts of 'cost' and 'surplus' over time. The lectures on value theory are in fact concerned with the history of the gradual 'transformation of the notion of cost from the original one of a stock of material goods, to the conception of an amount of human sacrifice – that is to say, the gradual transformation from an objective to a subjective point of view' (D2/4: 36). This transformation of the concept of cost (and value) was accompanied by a gradual evaporation of the traditional concept of surplus.

The lectures on value theory contain a host of insights and pointed remarks on the literature, on Senior's concept of 'abstinence' as well as on the Austrian theory of value and the problem of imputation which Menger, Böhm-Bawerk and Wieser failed to solve, on Pareto's theory of general equilibrium and, first and foremost, on Marshall's theory of value. *En passant*, Sraffa draws out several implications of long-period marginalist theory prior to their proper 'discovery'. For example, in a general framework he states

the dependence of relative prices and relative factor rewards on consumer tastes and thus the composition of 'demand'. He shows that in marginalist theory 'demand' has an impact on relative prices only to the extent to which it has an impact on income distribution. Alternative theories of value are seen to differ essentially in terms of their respective explanations of income distribution.

In the late 1920s Sraffa lectured also on Continental banking and between 1941 and 1943 on Industry. As is well known, as a student Sraffa worked on problems of monetary economics: he wrote a Laurea thesis on the problem of inflation in Italy during and after the First World War. His papers reflect his continuing interest in the field of monetary economics. Then there are a couple of single lectures Sraffa delivered on particular occasions. For example, in 1927 he gave a lecture on 'The corporative state' to the 'Keynes Club'. The lecture notes contain a critical analysis of the institutions created under Italian Fascism in order to balance the conflict between production and distribution goals.

In the folders devoted to 'Publications' (D3) we find the preparatory notes and manuscripts leading to Sraffa's published works. There is a substantial amount of material related to Sraffa's critique of Friedrich August Hayek's *Prices and Production* (see Sraffa 1932). Then there are numerous documents reflecting Sraffa's work on the Ricardo edition, how he managed to trace the locations of hitherto unknown letters and manuscripts, the difficulties Sraffa encountered and the way he dealt with them, etc. Yet by far the most important and largest part of the papers is related to the making of *Production of Commodities by Means of Commodities*. The respective material comprises several thousand pages and is rich with ideas and insights both of a theoretical and historical nature.

In addition to Sraffa's manuscripts, his library is of considerable interest, not least because of his annotations in the books he studied and the notes he wrote down. For example, in his copy of the *General Theory* there were placed two manuscript fragments scrutinizing Keynes's liquidity preference theory (see II00). Sraffa obviously did not think highly of Chapter 17 of Keynes's *magnum opus* and was especially critical of Keynes's use of a concept which Sraffa had introduced in his critique of Hayek: that of the 'commodity' or 'own' rates of interest.

3. Reconstructing the 'classical' theory of value and distribution

Sraffa's first important achievement was to render the theories of the classical economists comprehensible to us. In order to understand what this

accomplishment amounts to one must recall the state of the art at the beginning of this century, about which Sraffa wrote at the end of 1927:

It is terrific to contemplate the abysmal gulf of incomprehension that has opened itself between us and the classical economists. . . . The classical economists said things which were perfectly true, even according to our standards of truth: they expressed them very clearly, in terse and unambiguous language, as is proved by the fact that they perfectly understood each other. We don't understand a word of what they said: has their language been lost? Obviously not, as the English of Adam Smith is what people talk to-day in this country. What has happened then?

(D3/12/4: 14)

An analysis that had been 'submerged and forgotten since the advent of the "marginal" method' (Sraffa, 1960: v) had to be laid bare from under thick layers of interpretation.

In a note written in August 1931 Sraffa stated: 'The study of the "surplus product" is the true object of economics' (D3/12/7: 161.1). He in fact originally intended to complement his constructive work with a 'history of all the recent conceptions of surplus' (D3/12/7: 161.3). Here we cannot enter into a detailed discussion of Sraffa's complex views on the matter, which changed considerably over time, especially after he had begun to grasp, in winter 1927–8, the analytical structure of the classical approach to the theory of value and distribution. As a consequence, also his understanding of the marginalist theory, and its deficiencies, underwent some change. Whilst originally Sraffa was above all opposed to the subjectivist elements of that theory – he even contemplated the possibility of having Marshall's theory of value purged of all such elements (see D3/12/7: 114) – now the main target of his criticism became the explanation of profits in terms of the marginal product of a factor called 'capital'.

According to Sraffa, in the Physiocrats costs essentially meant *physical real costs*. This, he surmised, was the appropriate starting point of a probing into the problem of value and distribution. Originally, he was critical of Smith, Ricardo and Marx, because they had replaced that concept with that of labour. However, as his work progressed he saw that the concept of labour 'was still near enough to be in many cases equivalent' (D3/12/4: 2.i.a); and that it had allowed Ricardo in the *Principles* to preserve a salient feature of earlier theory: the explanation of all shares of income other than wages in terms of the surplus product.

Reconstructing the classical theory of value and distribution required Sraffa to go back to square one, to the beginnings of systematic economic analysis, and to work out the implications of adhering consistently to the concept of physical real costs. He was concerned with the essence of the theories of value put forward by authors such as Petty, Cantillon, the Physiocrats, Smith, Ricardo and Marx and stressed: 'This is not the theory of

any one of them, but an extract of what I think is common to them' (D3/12/4: 12). He stated it not in their own words, but in modern terminology. The result of his effort was meant to provide 'a sort of "frame", a machine, into which to fit their own statements in a homogeneous pattern, so as to be able to find what is common in them and what is the difference with the later theories' (D3/12/4: 12). The late 1920s saw him formulate the first equations of production that were eventually to grow into his 1960 book.

Sraffa followed the earlier authors in terms of method. He referred to the '“physician's” outlook of Petty' and quoted approvingly from the *Political Arithmetick*, in which Petty says that he has chosen to take 'the course (as a Specimen of the Political Arithmetick I have long aimed at) to express my self in Terms of *Number, Weight, or Measure*; to use only Arguments of Sense, and to consider only such Cases, as have visible Foundations in Nature; leaving those that depend upon the mutable Minds, Opinions, Appetites, and Passions of particular Men, to the Consideration of others' (Petty [1676] 1986: 244; see D3/12/4: 3). In another document Sraffa referred to a paper on 'Goethe's view of nature', whose authors stressed that Goethe had called his own way of thinking *gegenständliches Denken* (thinking in objects); they added: 'Any idealistic argument that obscured this objective reference is disliked' (D3/12/9: 46).

In terms of content Sraffa located an important difference between the classical and the marginalist theory in the concepts of wages adopted. He illustrated the difference in terms of the example of a carrot and a donkey (see D2/4/23 and D3/12/10: 61.ii). In Marshall the carrot has to be shown to the donkey to induce it to run, just as the wages are taken to *induce* the worker to work. In the classical economists on the contrary the carrot has actually to be given to the donkey for eating to keep it alive and enable it to run, just as the wage goods are needed to *enable* the workers to work and reproduce their race, before there is any question of inducement. This is clearly expressed in the Physiocrats, who reckoned the subsistence of workers amongst the necessary advances of production. A *given* real wage rate can indeed be said to be the linchpin of classical theories, because with it and known technical conditions of production of known quantities of commodities the surplus product, the substratum of all nonwage incomes, can be ascertained.¹

In the *Tableau économique* production is conceived as a circular flow, which stands in striking contrast to the (Austrian) view of a one-way avenue that begins in 'human efforts and sacrifices' (production) and ends in 'human satisfactions' (consumption) (D3/12/15: 9; see also Sraffa 1960: 93). The surplus product is taken to equal the difference between an amount of goods produced and a smaller amount of goods (means of production and

means of subsistence) consumed in production. The abandonment of what Sraffa called the 'agrocentric' view of the Physiocrats by Smith and his followers did not involve the abandonment of the concept of the surplus product, but only the received view of its distribution. As a reflection of the changed socioeconomic situation, the surplus was now envisaged to be shared out between land owners and the rising class of capitalists as rents and profits.

In an early note Sraffa specified the question which in his view the theory of value has to answer. He maintained: 'Given (from experience) the prices of all commodities at one moment, find a set of conditions that will make these prices appear to be necessary. This means, given the unknowns, find the equations (i.e. the constants): we therefore have given, and know, the 'unknowns', and are looking for the constants'. When this question 'is solved, once and for all, the particular questions asked are the reverse' (D3/12/9: 65): given a specific constellation of the constants, what are the corresponding necessary prices? Sraffa wanted to establish that the constants sought were the 'true absolute costs of commodities' (D3/12/6: 11), that is, those physical real costs that cannot be avoided if the respective commodities are to be procured. These costs can be seen *directly* in systems without a surplus: the physical real costs necessarily incurred consist of the means of production used up and the means of subsistence in the support of workers. Yet any real economic system is said normally to generate a surplus. Therefore, in order to render costs or, using Ricardo's term, 'absolute values' in the system under consideration visible, Sraffa suggested that one first has hypothetically to cut down the product, which is 'obviously identical with the shortening of the working day', until the surplus vanishes (D3/12/40: 175). Seen from this perspective, chapter I of Sraffa's 1960 book serves a particular analytical purpose: derived from the actual system by chopping off the surplus, 'Production for subsistence' contemplates a hypothetical economic system designed to clear the ground for a distinction between cost and (surplus) income.

In the most simple case possible, that is, assuming single production and setting aside scarce natural resources, the production equations set up by Sraffa show: 'how the factors produce the commodities (1 equation per commodity), so the commodities produce the factors (1 equation per factor)' (D3/12/13: 14; my translation from Italian). From the equations without a surplus the interesting result emerges that values are fully determined: they 'spring directly' from the methods of production and productive consumption, as Sraffa was later to stress (1960: 3). The resulting 'absolute ratios of value are the only ones that restore the initial distribution of resources' – in Sraffa's idiosyncratic phrase: 'a sufficient necessity to justify the conception' (D3/12/6: 7).

This is the starting point of Sraffa's analysis of the actual system, which is taken to generate a surplus. Depending on the rule according to which the surplus is distributed, actual prices will generally deviate from 'true absolute costs' or 'natural values'. As Sraffa put it: "Exchangeable value" was the result of natural value disturbed permanently by the scramble for the surplus' (D3/12/11: 83). In a first step he assumed that the entire surplus will be distributed according to the rule of 'equal percentage surplus', that is, a uniform rate of profits. He justified this premise in terms of the entrepreneurs' 'self-interest': 'If they did not get equal percentages, they would move to other industries' (D3/12/6: 10); competitive conditions are taken to prevail (D3/12/27: 2). It is then shown that relative prices and the rate of profits are fully determined, given the physical scheme. By assuming wages to be at the subsistence level, the resulting rate of profits is the maximum one supported by the system. Sraffa specified the concept of price underlying the classical approach as follows: 'Distribution determines values, & values justify that distribution' (D3/12/44: 7).

These early considerations gave support to Sraffa's intuition that a consistent solution to the problem of value and distribution could be found, using exclusively the data encountered in the approach of the Physiocrats and the classical economists: (i) the system of production in use; and (ii) the real wage rate(s). Only after this step had successfully been taken, could Sraffa begin systematically to study the problem that had bothered Ricardo until the end of his life: the impact of a rise (or fall) of the real wage on the rate of profits and relative prices.

That problem turned out to be much more intricate than economists generally were (and still seem to be) aware of. Sraffa stressed: 'In such a world, where everything moves in every direction . . . one sympathizes with Ricardo in his search for an "invariable measure of value". In a universe where everything moves we need a rock to which to cling, a horizon to reassure us when we see a brick falling that it is not we who are going up – nor that we are falling when we see a balloon rising' (D3/12/52: 17). As Ricardo had already maintained, the fact that 'profits [are] increasing at a compound rate . . . makes a great part of the difficulty' (*Works*, IX: 387; similarly IV: 388).

To facilitate the study of the change of prices as distribution changes, Sraffa, in a series of steps, groped his way to the concept of the 'Standard commodity', which proved to be a powerful tool of analysis and a useful pedagogical device. As Sraffa stressed, while it 'cannot alter the system's mathematical properties', it is explicitly designed to 'give transparency to a system and render visible what was hidden' (1960: 23). The first important mathematical property of a given system is its maximum rate of profits, the determination of which Sraffa had already concerned at an earlier stage of

his investigation. The Standard system allows one to ascertain that rate in a straightforward manner. It also provides 'tangible evidence of the rate of profits as a non-price phenomenon' (D3/12/43: 4), an observation which echoes Ricardo's contention that 'the great questions of Rent, Wages and Profits . . . are not essentially connected with the doctrine of value' (*Works*, VIII: 194). It should be noted that Sraffa related his concept explicitly only to that aspect of Ricardo's problem of an 'invariable measure of value' connected with the impact of changes in distribution on relative prices within a *given* technical environment, that is, a given technique. The other aspect that concerned Ricardo, interspatial and intertemporal comparisons, which refer to *different* technical environments, plays no role whatsoever; in fact, Sraffa accused Ricardo of confounding the two (see D3/12/43: 3).

Sraffa's (re)constructive work culminated in his 1960 book. He demonstrated that the theory of classical derivation was capable of dealing with a wide range of phenomena, including joint production, fixed capital, scarce natural resources, such as land, and the choice of technique. The characteristic features of the theory emerge with great clarity. Production is conceived as a circular flow. The means of production are divided into scarce and reproducible: scarce means of production yield their owners a rent, whereas reproducible means of production, that is, capital goods, yield their owners profits which in conditions of free competition tend to be proportional to the value of the capital invested.

The elaborate version of the classical theory typically starts from the following data, or independent variables:

- 1 the set of technical alternatives from which cost-minimizing producers can choose;
- 2 the size and composition of the social (gross) product, reflecting the needs and wants of the members of the different classes of society and the requirements of reproduction and capital accumulation;
- 3 the ruling real wage rate(s) (or, alternatively, the rate of profits); and
- 4 the quantities of the different qualities of land available.

The treatment of the wage rate (or the rate of profits) as an independent variable and of the other distributive variables as dependent residuals exhibits a fundamental *asymmetry* in the classical approach. Prices are considered the means of distributing the social surplus; they reflect both technical and social causes.

It deserves to be emphasized that these data are sufficient to determine the unknowns, or dependent variables: the rate of profits (the wage rate), the rent rates, and the set of relative prices supporting the cost-minimizing system of producing the given levels of output. No other data, such as, for example, demand functions for commodities and factors of production, are

needed or could indeed be utilized. The classical approach allows the consistent determination of the variables under consideration. It does so by separating the determination of income distribution and prices from that of quantities, which are taken as given or independently variable. Quantities were considered as determined in another part of the theory, that is, the analysis of capital accumulation, structural change and socio-economic development. It is interesting to note that Sraffa originally planned to develop a theory of capital accumulation (see, for example, D3/12/36: 6), to which the analysis of value and distribution put forward in his book was meant to be only a preliminary step.

4. Classical theory, the labour theory of value and marginalism

It is occasionally contended that with his book Sraffa wanted to re-establish the labour theory of value. According to some interpreters, he attempted to achieve this goal in terms of the Standard commodity. This view cannot be sustained. He knew perfectly well that the 'mathematical properties' of a given actual system would generally not show relative prices which, at all levels of the rate of profits, are always proportional to the relative quantities of labour embodied in the different commodities. As we have heard, the use of a particular standard of value, such as the Standard commodity, cannot 'alter' these properties; it can at most 'give transparency' to them.

As early as in a note dated 19 June 1943 Sraffa put forward an observation which at first sight is perplexing. He maintained that the marginalist authors are precluded from raising objections to the labour theory of value: 'For the Marginal Product theory of capital *presupposes, implicitly*, that Hypothesis' (D3/12/34: 33). And in a note written at the beginning of 1946 he pointed out:

The Irony of it is, that if the '*Labour Theory of Value*' applied exactly throughout, *then, and only then*, would the '*marginal product of capital*' theory work!

It would require that all products had the same org.[anic] comp.[osition]; and that at each value of r [rate of profits], *each* commod.[ity] had an 'alternative method', and that the relations within each pair should be the same . . . ; so that, even when the System is switched, and another Org. Comp. came into being, it should be the same for all products.

Obviously, this would be equivalent to having only one means-product (wheat).

Then, commodities would *always* be exchanged at their Values; and their relative Values would not change, even when productivity of labo[u]r increased.

(D3/12/16: 34)

Sraffa was thus clear at an early stage of his investigation that the 'parable' of neoclassical theory presupposes the 'realism' of the labour theory of value.

It also deserves to be mentioned that Sraffa had already worked for some time on problems of joint production when he got to know John von Neumann's paper on growth. Kaldor had arranged for the publication of an English translation of the paper and invited David Champenowne to write an explanatory note to accompany it. As we know from Champenowne, he would have been unable to accomplish this task without Sraffa's advice. In the context of a discussion of the above-mentioned contention concerning Sraffa's attitude towards the labour theory of value it should be pointed out that as early as around the turn of 1942–3 Sraffa mentioned the possibility of negative values in joint production systems (cf. D3/12/28). And in February 1946 he stated that in such systems, 'when we change r [the rate of profits] from its actual value, and make it, say, $= 0$, we may obtain negative [labour] Values' (D3/12/16: 35). With his finding that strictly positive prices need not involve strictly positive labour values, Sraffa anticipated the debate about negative labour values in the 1970s.

Those who accuse Sraffa of having advocated the labour theory of value appear to have missed a main message of his book, namely, that the classical approach is entirely independent of that theory: there is neither the need nor indeed the possibility to resurrect it.

As early as summer 1929, Sraffa pointed out: 'In order to have a marginal theory of distribution . . . we must have a physical measure of the quantity of each factor, independent . . . of its share of distribution' (D3/12/13: 17.5). And on 29 August 1946 he wrote:

The idea of capital as a 'quantity' is so deeply ingrained in anyone who has been brought up as an economist, that it requires some effort to get rid of it. One feels that there is 'some sense' in speaking of 'more' or 'less' capital and that there must be a way to make this more precise so as to be able to speak of 'how much more' & 'how much less'.

The 'rational basis' of this belief is said 'to lie in the fact that if capital were of uniform quality, then one could speak of its quantity – and measure it in tons, etc. as well as in price, *all with consistent results*' (D3/12/44: 1; emphasis added; similarly D3/12/16: 27). Yet when the capital consists of different objects, then there is only a singularly special case in which one can unambiguously say whether the quantity of capital has increased or decreased, and by how much: this is the case in which all objects vary in the same proportion. In normal conditions, Sraffa surmised, the amounts of some objects increase, whereas those of others decrease. Here the concept of 'quantity of capital' totally fails us – or leads us into 'nonsense' (D3/12/44: 2).

Some authors, including Böhm-Bawerk and the early Wicksell, believed they had found in the concept of the 'average period of production' a measure of 'the quantity of capital' that is independent of distribution and

thus prices. Yet, Sraffa observed on 15 December 1942, with reference to Wicksell's 'candid' admission that if compound interest and fixed capital are allowed for, the concept is no longer independent of the rate of interest:

The tautology is even more obvious than in the preceding case: to determine the rate of profit we must first know the q.[quantity] of capital; to measure the q. of cap. we must first know the period of production; and to find the period of prod. we must first know the rate of profit. But economists are so well adapted to the interdependence of economic quantities that they accept even the dependence of the constants of the problem upon its variables.

In a footnote he added: 'There is of course no sense in using simple interest, which means that the longer a period of investment is, the lower its effective return: which is impossible under competition. The point of using it is that it introduces an error in the result, which is sufficient to conceal the tautological character of the whole procedure' (D3/12/29: 3).

The unavoidable implication of this was that the marginalist theorists had to conceive of the 'quantity of capital' as a sum of *value*. However, they failed to find a measure that is invariable with respect to changes in the rate of profits (see D3/12/16: 14). Sraffa concluded: 'It seems clear that it will never be possible *a priori* to speak, in general, of an increase in the quantity of capital in the way required by the marg. prod. theory – i.e. before solving the equations & knowing the rate of interest' (D3/12/16: 42). Or, as he stressed elsewhere, representing the stock of social capital '*as one of the fundamental quantities* [as given] . . . is the source of many fallacies' (D3/12/21: 54).

In his paper on 'Capital Intensity and the Trade Cycle', published in 1939, Kaldor had argued that the indices giving the capital–labour ratios of different methods of production or techniques might be brought into an 'ordinal' ranking. Sraffa, in a note of 1942, observed:

There is no assurance that, owing simply to a change in the rate of interest, the order is not reversed. Suppose two commodities produced by similar proportions of capital & labour (i.e. which are similarly divided between profits & wages): but one contains more capital in the 'early' stages & less in the later ones – i.e. although the total quantity of interest is equal in the two commodities, in this one it is made up to a larger extent of compound interest: it is clear that if the rate of profits rises, the composition of this commodity will come to contain more profits (i.e. capital) than the other.

He added: 'But if interest changes, wages must change, & thereby the stock of capital required (i.e. the real structure) also must have changed', and 'the indices may register variations in the *opposite* direction to changes occurring in the structure of capital' (D3/12/15: 10–11). Therefore, it generally makes no sense to say that one industry is more 'capital intensive'

than another one unless the level of the rate of profits is specified at which the ranking of industries in terms of 'capital intensity' is meant to apply.

5. Concluding remark

Sraffa variously stressed that it would be naive to assume that there are no broader philosophical concerns behind the theories of value and distribution and that politics plays no role in the genesis of economic theory. While Sraffa's anti-fascist and socialist orientation inspired his intellectual work, they did not overshadow it. He would not allow ideological commitments to blur his logic. His unpublished papers document his honesty, self-criticism and love of truth. They show a meticulous scholar, possessed of a mind as independent as a human mind can possibly be. His questioning and critical bent did not come to a halt when his own ideas were under scrutiny. The judgement Hicks passed on Ricardo applies also to Sraffa: 'Ricardo had candour and courage; he followed his reasoning where it led him, not just where he (or his friends) wanted it to go' (Hicks, 1969: 151).

Sraffa was a remarkable intellectual, an original and profound thinker. His contribution to the history of economic thought has no rival in this century.

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Notes

- * I should like to thank Pierangelo Garegnani, literary executor of Sraffa's papers and correspondence, for granting me permission to quote from them. The papers are kept at the Wren Library, Trinity College, Cambridge. References to the papers follow the catalogue prepared by Jonathan Smith. Unless otherwise stated, all emphases are in the original.
- ¹ In a manuscript written in 1942, Sraffa expounded that in his equations the 'food & sustenance of the workers [are] treated . . . on the same footing as that of horses.' He added: 'Men however (& in this they are distinguished from horses) kick. The horse (or his physiology) takes a strictly private view of his relation with his food, & does not allow any extraneous considerations to interfere: he is a perfect utilitarian & thus forms the ideal object of study of the marg. utility economist.' (D3/12/16: 18)

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Abstract

The paper throws some new light on Sraffa's contribution, using material from his yet unpublished papers. Attention focuses on Sraffa's rediscovery of the distinct character of the classical theory of value and distribution and his refutation of the Marshallian interpretation that it is only a special case of demand and supply theory, his reformulation of the classical theory, and his criticism of the alternative neoclassical theory.

Keywords

Sraffa, classical economics, income distribution, value, capital