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A comment on Sraffa's 'classical economics'

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This paper tells the story of how Sraffa's interpretation of classical economics, particularly Ricardo, closely follows the developments of his own theoretical project that culminated in his book, *Production of Commodities by Means of Commodities*, in 1960. It highlights some early movements in Sraffa's position on classical economics and then a major shift in his position on Ricardo in the 'Introduction' to Ricardo's *Principles* in 1951. It brings forward archival evidence to suggest that Sraffa's new interpretation of Ricardo was perhaps influenced by his attempt to prove his 'Hypothesis' that the output/capital ratio of a given economic system remains constant with respect to changes in the rate of profits. This hypothesis as such, however, had nothing to do with Ricardo's problem of the 'invariable measure of value'. The paper concludes by pointing out that as early as 1927–28, Sraffa had set himself a task of constructing a homogenous understanding of classical economics in terms of modern terminology that would be helpful in understanding their scope from the point of view of his own theoretical project. Our story told here fits well with the task Sraffa had set himself at the beginning of his project.

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§1. This paper chronicles some significant changes that took place in Sraffa's interpretation of 'classical economics', particularly Ricardo, from 1925 to the publication of his book, *Production of Commodities by Means of Commodities* (*PCMC*), in 1960. It tells the story of how Sraffa's interpretation of classical economics closely follows the developments of his own theoretical project that culminated in his book. It is hoped that this puts in a better perspective Sraffa's allusion to the shared 'standpoint' of his book with the 'old classical economists from Adam Smith to Ricardo' (Sraffa, 1960, p. v). All Sraffa's unpublished notes are cited by the file reference and page numbers assigned to those papers by Jonathan Smith, the archivist of the Wren Library (e.g. D3/12…). All my insertions in Sraffa's notes are placed within curly brackets {}, since Sraffa himself extensively used parentheses and square brackets in his notes.

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§2. It is well known that in 1925, Sraffa's understanding of 'classical economics' was very much in line with Marshall's interpretation that Ricardo took supply functions as horizontal straight lines in the price quantity plane and therefore prices were independent of demand considerations. This implied that Ricardo was assuming constant returns to scale (or constant costs) in a partial equilibrium framework or also no substitution possibilities in technique in a general equilibrium framework: 'It can be said that all classical writers accept implicitly, as an obvious fact, that cost is independent of quantity, and they do not bother to discuss the contrary hypothesis' (Sraffa, [1925] 1998, p. 325).

§3. We find already a significant movement away from this position in summer 1927, when he wrote the first draft of the lecture notes for his upcoming lectures at Cambridge University, while he was in London. This is a hand-written long draft of about 70 pages, with a few pages now missing, with the title 'Notes: London, Summer 1927 (Physical Real Cost etc.)'. In this note, Sraffa draws the distinction between the classical theory of value and the modern Marshallian one on the grounds that classical theory was mainly interested in studying the *changes* in the aggregate variables such as 'how to increase the national wealth' (D3/12/3: 13) or 'how to change its distribution, or how to justify the present distribution' (*ibid.*), instead of the determination and changes in the exchange ratios of individual commodities, which is the main concern of the modern theory of value. Thus, given the two problematics, the two theories are understandably different.

The fundamental methodological difference Sraffa draws between the two theories is on the notion of causation. Sraffa argues that the problematic of classical theory leads it to search for the '*ultimate cause*' of value whereas the modern theory is designed to explain the equilibrium exchange ratios and their changes on the basis of '*mechanical causation*':

> If we are inquiring into the general problem of the causes of value, it is no use for us to argue that the value of bread is determined by the price of corn and by the money wages of bakers, that the price of corn is determined by the money wages of labourers and by the price of agricultural implements, that the money wages of labourers depend upon the prices of food stuffs, and so on ad infinitum—this would be a perfectly futile way of reasoning in a circle. On this general problem we must find some ultimate standard, independent from the variables we are considering, such {as} utility or disutility or labour. (Sraffa, D3/12/3: 17)[1]

At this stage, Sraffa considered the movement from the problematic of 'ultimate cause' to the problematic of 'mechanical causation' to be a movement from 'philosophical' to 'technical' as well as from political to apolitical:

> But it is a fact that while classical economists were inquiring into the 'prime cause' and the 'ultimate cause' of value, the modern attitude is largely to ignore those questions: not that they have been solved, nor that they have been proved to be insoluble (although some assumptions of this sort lies more or less vaguely in the back of the mind of many economists) but simply they are ignored, and the main system of modern economic thought proceeds to analyse the ways in which change takes place, without being hindered by the fact that little is known of the ultimate causes of change.
>
> Two sets of causes have contributed to bring about this change. In the first place the general progress of economics as a science, with its consequent shifting from the consideration of broad philosophical questions to the technical analysis of the mechanism through which economic

[1] There is, however, a large '?' drawn in pencil in the margin against the last sentence. Since the note is written in ink, the pencil mark clearly shows a later reaction. I shall return to this interesting marginal question mark in Section 4.

equilibrium is reached. In the second place, the change in the practical issues which have confronted the economists; the influence of the latter on theories which are supposed to be abstract and without any practical application is interesting. (Sraffa, D3/12/3: 13–15)

In the same note, Sraffa also puts to test the various candidates for the 'ultimate cause' of value. He first asks whether marginal utility could be taken as an explanation for the 'ultimate cause' of value of the modern theory. His answer turns out to be negative. The marginal utility of a thing must be measured by the utility of the alternatives forgone, for example, the marginal utility of the first slice of bread may be infinite to me but still I would not pay all my money for it as long as potatoes were available for a few cents. But such marginal utilities could be measured only under the partial equilibrium framework where the marginal utility of money can be taken as fixed and therefore the money price of the alternative forgone could be considered as the measure of the marginal utility of the commodity bought. But this requires equilibrium in all other markets and thus prices of all other goods to be fixed. This sort of measure of marginal utility is, by definition, dependent on the prices of other commodities and therefore can in no sense be considered the 'ultimate' cause or standard of value:

{I}f we accepted this sort of utility as an ultimate standard we would reason in a circle, explaining the utility of A with the utility of B, the utility of B with the utility of C, etc: worse than that, as of course the utility of B (being the rejected alternative, on the given scale of prices) being smaller than the utility of A, that of C smaller than that of B, etc., we would ultimately by successive degradations reach a commodity whose utility is practically zero, and this, through the chain of equivalences, would be equal to utility of A! (Sraffa, D3/12/3: 19)[2]

The same argument follows for the measure of real cost as marginal disutility of work is measured in terms of alternatives to which the labour could be put to. The root of the problem lies in the availability of substitutes.

Then he puts to examination the classical notion of 'labour' as the ultimate cause or the standard of value. Now 'labour' can be interpreted in two ways: (i) as the psychological or subjective disutility experienced by the worker; or (ii) as a real and objective cost. The first interpretation of 'labour' cannot stand the test, as explained above, since the marginal disutility of labour must be measured by the value of the substitute not produced. But the second definition does not fare any better either. There is no objective way by which labour of a wage labourer can be distinguished from the labour of a slave or even a horse. One way to 'objectivise' labour would be to reduce it to real items of consumption (or subsistence) of the worker. But if there are substitutes available for consumption (or the worker can consume various combinations of the same goods), then again there is no way of reducing 'labour' to some ultimate cause or standard. This leads Sraffa to comment:

It should be remarked that if this difficulty (of no substitutes) were overcome and an absolutely necessary commodity found, the difficulty of reducing to a common measure the various things entering into real cost would solve by itself. (Sraffa, D3/12/3: 44)

[2] It should be noted that Sraffa's position on Marshallian demand has also significantly changed since the publication of the 1925 paper. In 1925, Sraffa wrote: '[t]he "demand function" is based on an elementary and natural hypothesis, that of decreasing utility' (Sraffa, [1925] 1998, pp. 325). However, in this piece he favours the idea of demand curves as empirical curves and attacks the explanation of demand curves as caused by 'utility' behind it. Soon after (see Sraffa, D3/12/7: 68) he also comes to the conclusion that the idea of constancy of marginal utility of money in the Marshallian framework implies that all demand curves are shaped like rectangular hyperbolas, i.e. have unit elasticity throughout.

Next on the agenda is the general equilibrium framework. As we have seen above, within the partial equilibrium framework the prices of factors of production must be taken as fixed from outside because, if a change in the quantity supplied of a product causes prices of factors to change, then it in turn would affect the demand for the commodity and therefore the demand for the commodity cannot be taken as independent from its supply. But in a general equilibrium framework, it could be argued that the prices of the factors of production are ultimately determined by the utility/disutility of individuals and therefore prices of commodities are ultimately, however indirectly, determined by the utility/disutility of individuals. In this context, however, Sraffa raises the problem of measurement of utility. Within the partial equilibrium framework, money could be used to measure utility; but in a general equilibrium framework, this measure is not available to us. Sraffa thinks that within the general equilibrium framework we have no measure by which to apprehend utility: 'we have no direct way of apprehending it {utility}, of learning its existence: we have got its notion from an absolute hedonistic psychology, and on the collapse of the latter, we have simply kept it standing as an explanatory hypothesis', the explanation of demand price (Sraffa, D3/12/3: 67). This leads him to conclude that 'Pareto himself (though personally not giving up the belief in utility) has found it necessary to make his general system independent of utility and base it on empirical indifference (i.e. demand) curves' (*ibid.*, 68). Thus Sraffa wonders whether the general equilibrium framework could be legitimately used to get rid of the notion of 'ultimate standard' altogether: 'It {Pareto's doctrine} surely is mainly concerned with the mechanism through which equilibrium is reached, and is not in quest of an ultimate standard. But on the other hand, could it be denied that it may legitimately be used in challenging the existence of any such standard' (*ibid.*, 24).

§4. Soon after, Sraffa's well-known first and second equations follow and the quest for the 'ultimate cause or standard' falls by the way side—this explains the large question mark in the margin (see fn 1) of the above quotation from (D3/12/3: 17) in Section 3. During this period, i.e. winter 1927–28, Sraffa takes a highly critical stance against the classical economists, particularly Adam Smith and Ricardo. They are criticised for reducing all costs to labour. William Petty, a pre-classical economist, is held up against Smith and Ricardo as the purist who had the correct notion of cost:

> A{dam} Smith & Ricardo & Marx indeed began to corrupt the old idea of cost—from food to labour. But their notion was still near enough to be in many cases equivalent. (Sraffa, D3/12/4: 2(1))

> It was only Petty & the Physiocrats who had the right notion of cost as 'the loaf of bread'. Then somebody started measuring it in labour, as every day's labour requires the same amount of food. Then they proceeded to regard cost as actually an amount of labour. The{n} A. Smith interpreted labour as the 'the toil and trouble' which is the 'real cost' (Ricardo, p. 10, 15n) and the 'hardship'. (Sraffa, D3/12/4: 4)

At this stage, Sraffa starts to draw the distinction between the classical and the modern theories of value on the basis of their notion of cost. The classicists were supposed to hold on to the idea of 'cost' as an *objective* thing that could be touched, weighed, measured, etc. as opposed to the moderns for whom 'cost' was a *subjective* thing such as 'sacrifice' or 'disutility'. That is why Sraffa was very upset with Adam Smith, in particular

because his notion of labour as 'toil and trouble' lent itself to being interpreted in a subjective fashion as 'sacrifice' and at one time he went on to call Smith the 'vulgar' economist (in Marx's sense) among the classicists.

The shift in Sraffa's position on the distinction between the classical theory of value and its modern counterparts from his summer 1927 position to his winter 1927–28 position is well encapsulated in his 1928 lecture notes:

> I should like to notice that between these two notions of real cost {i.e. objective and subjective} it is not much a question of one of them being right and the other wrong, as of one being relevant for dealing with one set of questions, and other for an entirely different sort of questions. I think that the classical notion of costs, as quantities of things used up in production, is the most important from the point of view of the theory of value; in the determination of the price of a pair of boots I think that the amount of leather and of labour time employed in its production have much more to do than the inner feelings of the shoemaker and whether he enjoys his work or finds it unpleasant. But of course in such questions as that of measuring that (chiefly interest Marshall, such as) that of measuring maximum satisfaction, and finding means of increasing it, these objective quantities becomes {*sic*} irrelevant, and the amount of sacrifice has only to be taken into account. (Sraffa, D2/4: 24–5)

Contrast this to the 'Summer 1927' draft where the distinction between the classical and the modern theories of value is drawn on the grounds that the classicists were interested in questions related to *changes* in national income and distribution and not particularly in what determines relative equilibrium prices of commodities, as the moderns are. Now the distinction is drawn on the grounds of an objective basis for the determination of values by the classicists and the problem of the measure of welfare by the moderns.

During this period we also find Sraffa reinterpreting the classicists' concern for the ultimate cause of value as a confusion with the idea of the 'nature' of a new scientific concept, which actually requires or is in need of finding a new set of relations with the old concepts:

> The old conception of cost and value was designed to solve this fundamental problem: what is the relation, if any, between the importance to the community (R's absolute value) {,} *not* value in use {,} of a commodity and its price (exchange value). They assumed that there was a relation of some sort between the two, and they expressed this mysterious relation by such words as 'cause' or 'measure'—but obviously they did not mean what is their appropriate sense (analyse). (De Quencey, traditional confusion perpetuated by Böhm-B, Edgg., Clark)
> The modern conception is derived from the erroneous belief that the classics were literally looking for the 'causes' of value, and not its relation with importance, i.e. its 'meaning'. (Sraffa, D3/12/4: 5(1))

A few pages down, in a note written on 26 November 1927 titled 'Metaphysics', Sraffa comes back to this point once again:

> All the inquiry about value has always been (and still is and probably always will be) a purely metaphysical quest. When the old economists asked for the 'causes' or the 'measure' of value, they really were looking—as in fact we are, under the illusion of our equations 'determining' value—for the 'nature' of value (It is not an accident, as Cannan, elsewhere, says that the word is in A. Smith's title) in the same metaphysical sense in which we look for the nature of 'matter' or of 'mind'. In fact, we want to 'explain' in terms of familiar words or notions (i.e. to which we are used) the 'new' thing that we meet: but when we have got used to them (as now economists have with prices) we take them for granted and require no further explanation. The explanation has simply to be 'satisfactory' that is provide the accommodation suited for our mental habits, and prove restful to the mind—cool down the fever of quest and sate the thirst for explanation. (Sraffa, D3/12/4: 16)

§5. During the period from winter 1927–28 to 1931, we also find a few scattered remarks on Ricardo's theory of value in particular, where it is claimed that Ricardo's theory of value does not allow changes in distribution to affect value. In an eight-page note on Marx's and Ricardo's theory of value written prior to 1928, Sraffa attributes to Ricardo the proposition that distribution between profits and wages does not affect value. He then notes that the importance of Ricardo's theory for Marx is that a rise in wages leads to a fall in profits and it does not affect value. Later, the importance of Ricardo's distinction between labour and wages is noted and it is claimed that all the wrong interpretations of Marx confuse labour with wages. Further on, Sraffa notes that what Ricardo calls profit Marx calls surplus value (Sraffa, D1/21: 1–8). In 1928 the position remains the same, for example, in a note titled 'The Wages of Shepherds are Capital' a footnote appears stating: 'note however that on Ricardo's theory this would not be true—values are independent of wages' (Sraffa, D3/12/7: 40) and, again, 'If not Ricardo's proposition is true. Variations in wages do not affect values' (Sraffa, D3/12/7: 94).

In his lecture notes of 1928–31, Sraffa tells the story that Ricardo was a practical man and his interest in economic theory was purely driven by practical matters such as the 'Corn Law' controversies. He notes that in the 'Preface' to the *Principles*, Ricardo announces that:

> the principal problem in Political Economy is to determine the laws which regulate distribution', that is the distribution of 'the produce of the earth, all that is derived from its surface by the united application of labour, machinery and capital … among the three classes of the community, namely the proprietor of the land, the owner of the stock of capital necessary for its cultivation, and the labourers by whose industry it is cultivated.

Sraffa then goes on to add:

> The wording of this definition is remarkable; it is intended [or] meant to apply to the distribution of the whole of the national income, but it only mentions the produce of the surface of the earth, and regards all capital and all the labourers as only engaged in its cultivation. Ricardo was a city man, in fact he was in his outlook a typical representative of the commercial and manufacturing classes and was not likely to over-estimate the importance of agriculture, as the French physiocrats did, so as to make it include all productive industry. This definition is in fact characteristic of Ricardo's main interest which was not so much distribution in general between all those who take part in it as distribution between land-lord on the one side and all the others on the other. As Professor Cannan has shown, the origin of the Ricardian theory of distribution is entirely found in the Corn Law controversy of 1813–15. Ricardo's scientific interest in economics developed when his main theory had already been established in his pamphlets. This theory of distribution was an extremely effective argument against the Corn Laws. 'The divergence of interests with regard to the Corn Laws was a typical divergence of the interests of classes, and not of individuals. It was not a question of the rich against the poor, but of the land-owning class against the commercial and manufacturing class.' Ricardo's theory regarded as the fundamental problem, connected with the cost or production and value, the distribution between the landlord and the other classes; *when this was done the division of their share between capital and labour would take place on entirely different principles, but changes in the proportions of this distribution would not materially affect value of the product.* (Sraffa, D2/4/6: 6–8, emphasis added)

On the presupposition that Ricardo's theory was mainly designed to be used as a stick to beat the landlords, Sraffa at this stage believed that Ricardo remained ambivalent about whether the cost of production included only labour or also use of capital and

went on to more or less agree with Jacob Hollander's thesis of successive weakening (or at least ambivalence) of Ricardo's 'labour theory of value':

> Therefore Ricardo's theory lays great emphasis on the distinction between rent on one side and all other shares on the other; but he left in the background the question as to how the distribution of the other shares, that is, wages and interest, takes place, and the effects of the changes in the proportions of this division on the value of the product. What Ricardo's views were on this point is rather obscure, and it would be hard to say whether his theory of value based on the quantity of labour must be taken literally or interpreted as including the use {of} capital amongst costs. Probably, as Professor Hollander has shown in his book on Ricardo, he held different views at different times, and his changing views having been embodied in successive editions of the Principles, the result is that opposite passages from them can be quoted in support of both views. But however the historical point as to the interpretation of Ricardo is settled, it is, I think, true to say that Ricardo's views on this point are not very important; they play a secondary part in his theory, and as the question had no practical importance in his time he certainly gave little thought to it. (Sraffa, D2/4: 9–10)

§6. All this changed in the 1951 'Introduction' to Ricardo's *Principles*. Now Sraffa claims that the theory of rent was designed to 'get rid of rent', 'in order to simplify the problem of the distribution between capitalist and labourer' (Sraffa, 1951, p. xxiii). The new thesis presented in the 1951 'Introduction' repudiates his earlier position that 'variations in wages do not affect values'. According to the new position, variations in wages do affect values, but what remains unaffected against the variations in wages is the aggregate value of the net output:

> This preoccupation with the effect of a change in wages arose from his approach to the problem of value which, as we have seen, was dominated by his theory of profits. The 'principal problem of Political Economy' was in his view the division of the national product between classes and in the course of that investigation he was troubled by the fact that the size of this product appears to change when the division changes. Even though nothing has occurred to change the magnitude of the aggregate, there may be *apparent* changes due solely to change in measurement, owing to the fact that measurement is in terms of value and relative values have been altered as a result of a change in the division between wages and profits. This is particularly evident in the extreme case where the aggregate is composed of the same commodities in the same quantities, and yet its magnitude will appear to have changed as measured in value.
>
> The problem of value which interested Ricardo was how to find a measure of value which would be invariant to changes in the division of the product; for, if a rise or fall of wages by itself brought about a change in the magnitude of the social product, it would be hard to determine accurately the effect on profits (this was, of course, the same problem as has been mentioned earlier in connection with Ricardo's corn-ratio theory of profits). On the other hand, Ricardo was not interested for its own sake in the problem of why two commodities produced by the same quantities of labour are not of the same exchangeable value. He was concerned with it only in so far as thereby relative values are affected by changes in wages. The two points of view of difference and of change are closely linked together; yet the search for an invariable measure of value, which is so much at the centre of Ricardo's system, arises exclusively from the second and would have no counterpart in an investigation of the first. (Sraffa, 1951, pp. xlviii-xlix)

Here Sraffa relates the problem of Ricardo's 'invariable measure of value' with keeping the value of net output constant when its distribution changes and clarifies to the reader that there is no 'counterpart' to it in relation to the question: why do price ratios diverge from value ratios at any point of time? A problem that Marx's transformation of value into prices of production was designed to answer. We will come back to this in Section 9 below.

§7. How Sraffa's position on Ricardo changed so significantly and what brought about this change remain a mystery, as we have no archival footprints to trace this development. We know that on Keynes's initiative, Sraffa was appointed the editor of the Royal Economic Society's project of publishing the works and correspondence of David Ricardo in 1930 and in September 1931 Sraffa's three-year teaching contract at Cambridge University ended. After which, Sraffa stopped lecturing and apparently turned his attention to the Ricardo project. Strangely enough, there comes, at this juncture, almost a complete break in Sraffa's notes for a full decade. Apart from several drafts of his review of Hayek's *Prices and Production* and his reply to Hayek's response and one small note on language for discussion with Wittgenstein (perhaps written in early 1932), we have almost nothing in his files till 1942.[3] Now in the extant notes available in Sraffa's archives at the Wren Library, we find a prodigious flow of notes from 1942 to mid-1944, mainly related to the issues that are dealt with in his book (Sraffa, 1960), however there is nothing significant either on Ricardo or classical economics in general, except for the following: (i) one short note titled 'Equations with Profits Ricardo's Case', written on 16 February 1942 (D3/12/16) on the one-good 'corn model' equation of profit, in which the rate of profit is determined by the single equation independent of values with an interesting N.B.: 'what are the limits within which the above case is possible without making the system of equations contradictory?'; and (b) a few short notes written over seven pages and over the period of 28 December 1942 to 5 January 1943 titled 'Ricardo Effect'. In these notes, Sraffa takes up Ricardo's case of a rise in wages leading to a fall in the rate of profits, which makes adoption of a machine-intensive technique more profitable than a labour-intensive technique (Ricardo's *Principles* [*Works I*] ch. 1, V). Sraffa considers Ricardo's case to be the 'one of the toughest supports of the Marg{inal} Prod{uct} Theory'. There are two issues Sraffa seems to be interested in understanding in these notes: (i) Is Ricardo's case valid only because he takes the example of unassisted labour producing machines and then machines and labour producing the commodity in one case and unassisted labour directly producing the commodity in the other case? He thinks that this is a special example and in general case where commodities are produced by means of commodities Ricardo's results may not be always true. (ii) Is it always true that given r, one can know which technique must be most profitable or chosen? His answer is:

> If our hypothesis *is* verified the answer probably is NO, if the quantity of capital is given (fixed) either in labour or value (being the same measure)
> YES, if the quantity of capital is *not* fixed, i.e. if R is variable and accumulation can take place as required. (Sraffa, D3/12/29: 7)

Apart from these brief notes on Ricardo, we also find some extended comments written mainly in early 1943 on Bortkiewicz's criticism of Marx, particularly on his falling rate of profits thesis, which yet again deals with the question of choice of techniques against a rise in wages, and the use of Marx's transformation of values into prices to solve the problem of his 'Hypothesis', to which we will come later in Section 9.

[3] There are a few drafts written in 1941 of a lecture on Italian economic problems delivered on invitation to a study group of British military officers and some lecture notes, mostly written in 1942 but some in 1941, on industry for lectures delivered during 1941–43—neither of the notes contains anything of interest for our purpose, however.

After 1944, the same phenomenon reoccurs: the flow of notes almost completely dries up for a decade only to begin once again in 1955. Scholars who are familiar with Sraffa's archive at the Wren Library know that there is very little intellectual material available on Ricardo in all his extant files. Most interestingly, we do not find even a draft of his famous 'Introduction' to Ricardo's *Principles* in his files—all we have is the final galley proof of the 'Introduction', though we have an earlier proof of the 'Acknowledgement', where one can see a couple of names deleted. Thus there is no doubt that important papers are missing from the Sraffa files at the Wren Library. Could it be possible that Sraffa put most of his intellectual notes of the two decades of work mainly on Ricardo into separate files, which somehow got lost or purposely destroyed by Sraffa? The suspicion of an intentional destruction becomes stronger when we find that many files relating to the Ricardo project that contain mostly non-intellectual materials, such as Sraffa's correspondence with others regarding Ricardo's papers or his life, are preserved.

Given that by Sraffa's own account, 'by the summer 1940, six volumes of the present edition had been set up in page-proof, while the volume of Speeches and Evidence had reached the stage of galley-proofs' (Sraffa, 1951, p. ix), one would expect that Sraffa must have had at least a rough draft of the 'Introduction' ready by then. Moreover, given that Sraffa had a habit of writing several drafts of any piece he intended for publication, there is no doubt in my mind that there must have been several drafts of the 'Introduction' written over a number of years.[4] As a matter of fact, in a response to Keynes's letter of 26 March 1943, where Keynes showed his extreme frustration with the whole project dragging on for so long, Sraffa reported that 'of the Introductions, all those which must go in the middle of a volume are ready: the others (three of them) go at the beginning of volumes and can be printed later, on pages with roman numerals. On these I have done much work, and drafted parts over and over again: all the material is collected, but it is the drafting of the Introductions that has been holding up the whole thing' (Sraffa, D3/11/65: 26, dated 31 March 1943). No sign of these 'drafts' is available in Sraffa's files. Had they been available to us, it could have given us a direct glimpse of how Sraffa's interpretation of Ricardo evolved or changed over the two decades of the 1930s and '40s.

§8. In any case, Sraffa relies heavily on Ricardo's unpublished drafts on 'Absolute Value and Exchangeable Value', written only a few weeks before Ricardo's untimely death on 11 September 1823, for his new position. Since these drafts were part of the missing 'Mill–Ricardo' papers and were only found in July 1943, one could surmise that the new position evolved only after the discovery of the 'Mill–Ricardo' papers. But by following Sraffa's own reasoning, we find that no such conclusion is warranted. Sraffa does not provide any direct evidence for his claim that 'in the course of that

[4] Brian Pollitt (1988) has highlighted Maurice Dobb's highly constructive assistance in writing the Introduction to Ricardo's *Principles*. His account gives an impression that Sraffa in some sense suffered from 'writer's block' and was simply unable to put his ideas on paper—this reinforces what was a general impression in academic circles those days (see Samuelson, 1990)—whereas Dobb was able to write down Sraffa's ideas expressed verbally in discussions with him. It is, however, hard to maintain this impression after a thorough examination of Sraffa's archive. Though it is true that Sraffa was quite circumspect regarding publication and did write and rewrite the drafts several times before going to press, he did not seem to suffer from any writer's block when it came to putting ideas down on paper for his own consumption. Pollitt's account also does not clarify whether there was any complete or partial draft already written by Sraffa on which Dobb started to work after he joined the project in 1948.

[division of national product between classes] investigation he [Ricardo] was troubled by the fact that the size of this product appears to change when the division changes' (*op. cit.*). In this context, Sraffa emphasises that by *absolute* or *real* value Ricardo means the value of a commodity measured against the 'invariable measure of value':

> The idea of an 'invariable measure' has for Ricardo its necessary complement in that of 'absolute value'. This concept appears in the *Principles* at first (in ed. I) as 'absolute value' and later (in ed. 3) as 'real value', it comes out from time to time in his letters, and takes more definite shape in his last paper on 'Absolute Value and Exchangeable Value'. In one of the drafts for that paper he writes: 'No one can doubt that it would be a great desideratum in political Economy to have such a measure of absolute value in order to enable us to know[,] when commodities altered in exchangeable value[,] in which the alteration in value had taken place'. (Sraffa, 1951, p. xlvi)

And then Sraffa immediately goes on to add:

> In another draft he [Ricardo] explains what he means by a test of whether a commodity has altered in value: 'I may be asked what I mean by the word value, and by what criterion I would judge whether a commodity had or had not changed its value. I answer, I know no other criterion of a thing being dear or cheap but by the sacrifices of labour made to obtain it'. (Sraffa, 1951, p. xlvi)

Thus the second (actually the earlier) draft makes it clear that the *real change* in value for Ricardo always means *change* in its labour content *only*. Now, when we put the two positions together—i.e. (i) a change in 'absolute value' or 'real value' is the change measured against the 'invariable standard' and (ii) a change in 'absolute value' is a change in its labour content—we arrive at the inescapable conclusion that the changes in value of any commodity measured against the 'invariable standard' measure *only* the changes that are caused by changes in its labour content. Therefore, all the *apparent* changes in its exchangeable value caused by changes in wages or profits must *ipso facto* disappear (i.e. become zero) when measured against the 'invariable standard'. This is the property of the 'invariable measure' that Ricardo was looking for. However this is not concerned with keeping the size of the net output constant with respect to changes in wages, but rather showing that changes in wages have no impact on the exchangeable value or price of a commodity—precisely the position Sraffa held during the 1927–31 period.

And this is also consistent with Ricardo's position in the third edition of the *Principles (Works I)*. In Section VI on 'an invariable measure of value', Ricardo—after arguing that the differences in the direct and indirect labour composition of capitals across industries render it impossible for any single commodity to be an 'invariable measure of value' for all the commodities with respect to changes in wages—goes on to argue that if gold is *assumed* to be a commodity that is always produced by the same amount of labour and that its direct and indirect capital composition is somewhere in the middle of *most* of the other commodities, then it can be argued that the changes in the prices of all other commodities due to changes in wages would be minimised and therefore legitimately ignored (i.e. assumed to not exist):

> Neither gold then, nor any other commodity, can ever be a perfect measure of value for all things; but I have already remarked, that the effect on the relative prices of things, from a variation in profits, is comparatively slight; that by far the most important effects are produced by the varying quantities of labour required for production; and therefore, if we suppose this important cause of variation removed from the production of gold, we shall probably possess as near an approximation to a standard measure of value as can be theoretically conceived. May not gold be considered as a commodity produced with such proportions of the two kinds of capital

as approach nearest to the average quantity employed in the production of *most commodities*? (Ricardo, 1951, *Works I*, p. 45, emphasis added)

The point to be noted here is that Ricardo does not claim that the 'average commodity' as the standard of measure would render deviations of prices due to changes in profits in such a manner that both positive and negative movements of prices would cancel each other out and leave the value of the net output constant. His concern is solely with *minimising* the price movements due to changes in wages or profits so that they could be rendered small enough to be *ignored*—and that could be achieved by minimising the difference in the composition of the two kinds of capital of most of the commodities from the composition of capital of the standard of measure. It is important to note in this context that Ricardo refers to the 'average' of '*most* commodities' and not *all* commodities. This is because Ricardo leaves out 'extreme' commodities from his consideration, since the deviations in prices of those commodities cannot be assumed to be small enough from the 'average commodity' to be ignored; however this would not create a problem if his concern was only to ensure that the total deviation was zero.

Sraffa, however, relies more on Ricardo's later draft on 'Absolute Value and Exchangeable Value', where Ricardo refers to a '*mean* between extremes of commodities produced on one side by labour and advances for much more than a year, and on the other by labour employed for a day only without any advances' (*Works IV*, p. 405). But then Ricardo goes on to add, 'and the mean will in *most cases* give a much less deviation from the truth than if either of the extremes were used as a measure' (*Works IV*, p. 405). Here again, 'most cases' refers to most of the commodities and not all commodities and 'truth', of course, refers to zero deviation. So the positions in the third edition of the *Principles* and again in the draft on 'Absolute Value and Exchangeable Value' of 1823 remain consistent.

But, of course, Ricardo was wrong in assuming that changes in the distribution will have no effect on relative values if they were measured against an 'invariable measure of value', for the simple reason that changes in the distribution affect relative values of commodities and thus logically there cannot be any commodity against which the relative values of commodities could remain constant in the face of changes in distribution. Now we find that Sraffa, in his 'Introduction', endorses this conclusion in a paragraph that appears quite anomalous with respect to his 'new interpretation':

In this attempt to extend the application of absolute value to the second problem (that of distinguishing the two sorts of changes in exchangeable value) Ricardo was confronted with this dilemma: whereas the former application presupposes an exact proportionality between relative and absolute value, the latter implies a variable deviation of exchangeable from absolute value for each individual commodity. This contradiction Ricardo never completely succeeded in resolving, as is apparent from his last paper. (Sraffa, 1951, p. xlvii)

The fact that Ricardo had come to realise that what he was searching for was a logical impossibility or a chimera is evident in his letter to Mill written six days before his untimely death: 'I have been thinking a good deal on this subject lately but without much improvement—I see the same difficulties as before and am more confirmed than ever that strictly speaking there is not in nature any correct measure of value nor can any ingenuity suggest one, for what constitutes a correct measure for some things is a reason why it cannot be a correct one for other' (Ricardo, *Works IX*, p. 372, dated 5 September 1823). The point to note here is that Ricardo thinks that there are properties that could constitute a commodity to be a 'correct measure' for *some commodities* but

not for all. Clearly that property holds for those commodities that are produced by the identical composition of direct and indirect labour ratios and since the assumption of the theory is that this ratio is not equal for *all* commodities, it is evident that what makes it the 'correct measure' for some also makes it the incorrect measure for others. Here it is clear that Ricardo's 'correct measure' is solely concerned with ensuring no deviation in value due to changes in wages and has nothing to do with the problem of keeping the size of the net output constant with respect to changes in wages, as in this case the idea of a measure being 'correct' for some commodities has no meaning.[5]

§9. T herefore the question is: how and why was a new interpretation superimposed on an old one? In his book, Sraffa (1960) tells us that his new interpretation of Ricardo 'suggested itself as a natural consequence' only after 'the Standard system and the distinction between basics and non-basics had emerged in the course of the present investigation' (p. 93, Appendix D). A perusal of his notes of the period 1942–44 gives us a clue as to what Sraffa could mean by 'a natural consequence'. The idea that Ricardo's concern for the 'invariable measure of value' relates to the problem of keeping the size of the pie constant when it is cut into various proportions has some relation to his 'Hypothesis', which was concerned with the problem of keeping the maximum rate of profits or the output/capital ratio, '*R*', constant when wages and consequently prices change throughout the range of wages from 1 to 0 or the rate of profits from 0 to *R*:

> What is demanded of a model is that it should show a constant (constant with respect to variations of *r*) ratio between quantity of capital & quantity of product. If this can be constructed, and proved to be general, a number of important 'consequences' follow. (Sraffa, D3/12/16: 14)

During the period 1942–44, Sraffa's main concern was to prove his 'Hypothesis', which had nothing to do with the idea of keeping the size of the pie constant when it is cut into various proportions. Instead, the 'Hypothesis' was designed to prove that the foundation of the marginal productivity theory of distribution is weak, as it proves that the rate of profits is independent of the productivity of social capital. It was in this context that Sraffa in 1942 had enlisted Marx's transformation of values into prices of production as a helpful aid for a proof of his 'Hypothesis' rather than Ricardo's concern with his 'invariable measure of value':

> The requirement{s} of a *model* are:
> With annual (agricultural) production:
> That the ratio of Total Product (C + V + S) to Constant Capital should be constant with respect to variations in *r* (in distribution). Also that the ratio of Total Product to Constant & Variable Capital should be the same whether measured in value or in Price, at the ruling *r* [not as in first case, for any *r*, for variable changes with *r*]
> This is satisfied if the three groups have each the same organic composition, [whatever the prices & *r*]. (Sraffa, D3/12/16: 15, dated 19 August 1942)

The first condition states that (C + V + S)/C = [1 + (V + S)/C] = 1 + *R* (constant), with variation in the rate of profits (*r*). This is Sraffa's hypothesis stated in Marx's labour value terms. The second condition states that (C + V + S)/(C + V) = [1 + S/(C + V)] is the same for both value accounting as well as price accounting. The second condition amounts to the claim that Marx's average rate of profits, given by S/(C + V),

[5] For a more detailed discussion on this question, see Sinha, 2010a,b.

is the valid rate of profits for price accounting. At this stage it is important, to distinguish Marx's transformation of values into prices of production and Sraffa's *use* of it for his own purpose. As is well known, for Marx ([1894] 1991), the problem was that given a positive rate of surplus value, the proposition that exchange of commodities represent exchange of equal values comes in contradiction with the condition of equal rate of profits in a freely competitive economy, if the organic composition of capitals of all its industries are not equal throughout. Marx solves this problem by pooling all the surplus values produced in the system and dividing the pool with the aggregate of constant and variable capitals of all the industries to derive the average rate of profits for the system; he then claims that the divergence of price ratios from value ratios is nothing but an effect of the redistribution of the total surplus value to various industries on the basis of the average rate of profits on their total capital investments. This is an explanation of the *difference* of price ratios from value ratios. The explanation does not require any 'invariable measure of value'—any arbitrary commodity can be chosen as a measure. However one of the implications of Marx's transformation procedure is that if a commodity was produced by an industry with the average organic composition of capital, then the value ratio s/(c + v) of this particular industry would coincide with the average rate of profits of the system and therefore there will be no reason for prices of production of this commodity to diverge from its value. Sraffa, however, uses Marx's transformation results in the context of *change*. He starts from a position when the rate of surplus value is zero and hence the rate of profits is zero. In this case the price ratios coincide with the labour value ratios. Then Sraffa reduces the wage rate so that a positive rate of surplus value and profits emerges. Now Sraffa reckons that if Marx's transformation of values into prices of production was correct, then the resulting price ratio deviations from value ratios should be explained by pooling the released wages in all the industries and redistributing them equally to all the industries according to their capital investments. This must leave the value of total net output (i.e. wages plus profits) equal before and after the change—this is exactly the condition Sraffa (1951) claims Ricardo wanted to establish. The question for Sraffa, however, was would it also leave the ratio of net output to non-wage capital undisturbed? That is, would the measure of aggregate constant capital also remain undisturbed when change in wages induces exchange ratios to change?

Sraffa first reckons that if the organic composition of capitals of C, V and S (i.e. of the aggregates) are the same, then both the conditions should be satisfied and the hypothesis should turn out to be true. At this stage, Sraffa was inclined to accept that empirically one should expect that the organic composition of capitals of C and (V + S) must be near equal given the law of large numbers and the fact that which commodity falls under C or (V + S) is a random process. If this was true, then the correctness of Marx's transformation of values into prices of production would *ipso facto* prove the correctness of his hypothesis. But soon he realised that the aggregate constant capital C is itself made up of various commodities, which may differ in their respective organic compositions. Thus when the rate of profits changes, then the prices of those commodities would change and in turn change their organic compositions of capital, which in turn must make those prices change again and so on:

> As soon as we classify commodities (capitals producing them) according to their composition into constant & variable, we notice that the constant part of a *particular* capital is itself variable; in fact we have only stipulated that it should be constant only in social capital as a whole, & have no complaint.

That is to say, we solve the Agr{icultural} equations {i.e. all equations with equal rotation period or annual or 'harvest' cycle} for r = 0 and attach to each equation an index $\frac{c}{v}$, such that c is equal to the sum of the commodities used in production in that industry, valued for r = 0, and v is the quantity of labour multiplied by an arbitrary wage (any w_0 will do provided we stick to it throughout).
We immediately notice that, for variations of *r*, this c is itself variable—though always less variable than v. (Sraffa, D3/12/21: 3, dated 27 September 1942)

This led Sraffa to leave Marx's transformation of values into prices of production behind and work with the idea that the physical composition of the net output and the non-wage capital must always be approximately the same, i.e. they are made up of the same composite commodity. This again was justified on the grounds of the law of large numbers and the assumption that any particular commodity falls either into the set of non-wage capital or the set of net output in a random fashion. Soon Sraffa realised that he could rescale his equations without affecting the mathematical properties of his system of equations:

For, in our system of equations, we can multiply both sides of any equation by an arbitrary number, leaving *all* the results unaffected; and we can multiply by different numbers different equations. …
Ipso facto there disappear from the equations some absolute quantities which so far I have regarded as of fundamental importance. (Sraffa, D3/12/35: 27, dated 19 November 1943)

This led to the development of the Standard system associated with any given empirical system and to the final conclusion that *R* remains constant with respect to changes in *r* in any given empirical system as long as wages are given in terms of the Standard commodity.

§10. There are two aspects of Marx's transformation of values into prices that were crucial to Sraffa: (i) the average rate of profits of the system can be determined independently of prices, i.e. 'profit is a non-price phenomenon'; and (ii) a commodity produced by the 'average organic composition of capital' will show no deviation from value. Now we can see that all these aspects of Marx's economics are brought to bear upon Ricardo's theory of profits and the problem of the 'invariable measure of value' in the 'Introduction' to Ricardo's *Principles*. It is for good reason that Sraffa acknowledges his debt to Marx for the idea of the 'maximum rate of profits', which is the value of '*R*', in his book (Sraffa, 1960, Appendix D). But as we have noted above (Section 9), Sraffa had to abandon Marx's formulations on his way to his final position on the proof of the constancy of '*R*' with respect to changes in the rate of profits. In the course of the search for the proof of the constancy of '*R*', Sraffa realised that the 'average industry' is not given by Marx's 'average organic composition of capital industry'. It had to be a weighted average, which the Standard system and the Standard commodity represent:

There are besides, many possible applications {of the Standard commodity}, which I have not mentioned in the book, in problems discussed by Marx. Take, e.g. the determination of a general rate of profits, from the rate of surplus value: Marx takes an average of the rates of profits obtained in the production of the different commodities on the basis of 'values', and gets, as he acknowledges, an *approximately* correct result. An exact result could however be obtained by taking, instead of a simple average, a weighted average: & it can be shown that the appropriate weights can be derived directly from the proportions in which the comm{odities} enter the 'St{andard}

com{modity}'. Similarly, in the application of M{arx}'s notion of the comm{odity} produced by 'a cap{ital} of av{erage} org{anic} comp{osition}': for an exact result the average must be found in the same way, in other words that comm{odity} is the St{andard} Com{modity}. (Sraffa, D3/12/111: 132, letter to Eaton dated 12 February 1961)[6]

§11. But why did Sraffa have to relate Ricardo's problem of the 'invariable measure of value' to the problem of keeping the size of the pie constant? Now, from the point of view of his problem of the constancy of *R*, it connects Ricardo's problem with Marx's idea of the 'pool' of profits, i.e. all the gains from a fall in wages are collected in a 'pool' and through the price mechanism allocated to individual industries in proportion to their capital investment, which helps translate Ricardo's hypothesis built on *causation* to a purely mathematical problem that is *non-causal* in nature; as Sraffa's emphasis on *no-change in output* suggests: 'This is particularly evident in the extreme case where the aggregate is composed of the same commodities in the same quantities, and yet its magnitude will appear to have changed as measured in value' (Sraffa, 1951, pp. xlviii-xlix). The evidence from Sraffa's notes of 1942–43 does lend some support to Pier Luigi Porta's long-standing thesis (see Porta, 1986, 2012) that Sraffa's interpretation of Ricardo is highly influenced by Marx's transformation problem.[7]

§12. In the 'Introduction', Sraffa writes:

> The problem of value which interested Ricardo was how to find a measure of value which would be invariant to changes in the division of the product; for, if a rise or fall of wages by itself brought about a change in the magnitude of the social product, it would be hard to determine accurately the effect on profits (this was, of course, the same problem as has been mentioned earlier in connection with Ricardo's corn-ratio theory of profits) (Sraffa, 1951, pp. xlviii–xlix).

Here he conflates two issues: (i) a scientific requirement of having an 'invariable scale' with respect to changes in wages to measure the changes in the prices of other commodities due to changes in wages; and (ii) a supposed consequence of such a measuring scale, which may or may not be true, that such an 'invariable scale' must ensure that the size of the total net output remains constant before and after the changes in wages. It appears that when Sraffa wrote the 'Introduction' he was not fully aware that point (ii) cannot be sustained. Once the Standard net product is taken as the *numéraire*, instead of the actual net product, it can no longer be claimed that the size of the actual net output would remain constant when wages move from 1 to 0. This realisation is clearly put forth in the book:

> Reverting to our example, if in the actual system (as outlined in §25 ff., with $R = 20\%$) the wage is fixed in terms of the Standard net product, to $w = \frac{3}{4}$ there will correspond $r = 5\%$. But while the share of wages will be equal in value to ¾ of the Standard national income, it does not follow that the share of profits will be equivalent to the remaining ¼ of the Standard income. The share of profits will consist of whatever is left of the *actual* national income after deducting from it the equivalent of ¾ of the *Standard* national income for wages: and prices must be such as to make the value of what goes to profits equal to 5% of the value of the actual means of production. (Sraffa, 1960, p. 23)

[6] John Eaton's (real name: Bodington) review was published in Italian in the journal *Società* and brought to Sraffa's notice by Maurice Dobb. See Bellino, E. (2006) for the English translation of Eaton's review and the entire draft response of Sraffa.

[7] Also see De Vivo and Gilibert (2013) and related bibliography on the issue of the influence of Marx's reproduction schema on Sraffa's fundamental equations.

In other words, the Standard commodity does not solve Ricardo's problem of keeping the value of the net output of the actual system constant, if, indeed, that was Ricardo's problem.

As a matter of fact, in the drafts of the *PCMC* written in 1955, we find that Sraffa begins to interpret Ricardo's problem of the 'invariable measure of value' in terms of the first point *only*. For example, in his earlier draft, we find a reference to Ricardo's problem of 'invariable measure of value' in the following terms:

> In such a world, where everything moves in every direction; where wages can increase more than profits fall; where the value & indeed the composition of the nat{ional} rev{enue} can change merely because it is divided in different ways; where prices of commodities rise or fall; where … one sympathises 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 to, 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. (Sraffa, D3/12/52: 15, dated 18 March 1955)

And again in the later draft, Sraffa writes:

> If we observe the movements of the price of commodity *a* in terms of commodity *b* we shall never know how much of any fluctuation originates in the circumstances of *a* & how much of those of *b*. The attempt to eliminate this type of disturbance lies at the basis of R's suggestion that we take as standard a comm. that is equally distant from the two extremes, 'those much capital … & those much labour [quote R. This criterion, we shall soon find, is inadequate and assumes a measurability of capital (or of 'time') which R himself elsewhere denies (let. To M^{c}C). (Sraffa, D3/12/53: 4, dated 6 September 1955)

It should be noted that in the later draft, even a passing reference to 'the composition of the nat{ional} rev{enue} can change merely because it is divided in different ways' is removed and Ricardo's problem is attributed only to the changes in the relative prices of the two commodities. These remarks were written in the context of *PCMC* and the construction of the Standard commodity. Here we can see that Sraffa begins to distance his interpretation of Ricardo's problem from the requirement of the constancy of the size of the net output and relate it directly to the property of the Standard commodity, which ensures that the price movements due to changes in wages measured against this standard would always measure the changes that had come about in the price of the commodity measured, and not in the standard. And finally in the book (see Sraffa, 1960, Section 23, p. 18), even the reference to Ricardo is removed.

§13. In 1927–28 Sraffa had set himself a task in the following manner:

> 'Principio':
> I shall begin by giving a short 'estratto' of what I believe is the essence of the classical theories of value, i.e. of those which include W. Petty, Cantillon, Physiocrats, A. Smith, Ricardo & Marx. This is not the theory of any one of them, but an extract of what I think is common to them. I state it of course, not in their own words, but in modern terminology, and it will be useful when we proceed to examine their theories to understand their portata *from the point of view of our present inquiry. It will be 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. (Sraffa, D3/12/4: 12, emphasis added)

Our analysis of Sraffa's interpretation of Ricardo suggests that it was indeed an active constructive process of fitting Ricardo into the 'frame' or processing him through the 'machine' that he was constructing, which, at least partially, took shape in his book.

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