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Abstract

The two 'slogans' written by Sraffa in an early draft of the preface to his book (Sraffa Papers D3/12/43:1(3)) can be seen as the synthesis of a wider reasoning that he outlines in some manuscripts composed in 1955 and 1956. We rationalise this reasoning by three statements: A. The rate of profits manifests itself in the Standard system as the ratio of two well-defined quantities of Standard commodity; B. The rate of profits can be identified in the Standard system before knowing the prices of commodities; and C. The rate of profits emerging from the Standard system cannot be altered by 'manipulations of prices' and, for this reason, can be regarded as a non-price phenomenon. By discussing these statements in depth, we aim at shedding new light on the precise meaning of Sraffa's slogans.

JEL Codes: B24; B51; D33; D46

1. Introduction

In an early draft of the preface to his book, Sraffa writes two slogans that he then decided not to use:

> The St{andard} Syst{em} provides tangible evidence of the rate of profits as a non-price phenomenon.
> A Dividend could be declared before knowing what is the price of the company's product. {Sraffa Papers D3/12/43:1(3)}

These slogans are quoted in many essays, in most of which they are related either to the Marxian problem of the transformation of values into prices of production or to the possibility of addressing the determination of distributive variables separately from that of commodity prices.[1] In this paper, we try to clarify the precise meaning of the slogans through accurate examination of Sraffa's manuscripts, and we suggest a possible reason why Sraffa eventually decided not to use them.

[1] Cf. for example, Kurz (1998); Sinha (2000; 2010; 2012; 2016; 2021); Pasinetti (2001); Kurz and Salvadori (2001); Carter (2013; 2014; 2017); Gilibert (2013); and Carter and Lazzarini (2013).

As we show in section 2, the slogans can be seen as the synthesis of a wider reasoning that Sraffa outlines in some manuscripts composed in 1955 and 1956. The central point of this reasoning concerns the nature of the rate of profits of the Standard system as the ratio of two physical quantities of the same commodity. We focus on this point in section 3, in which we also discuss one of its implications – namely, the possibility of determining the rate of profits of the Standard system before commodity prices are known. We then see in section 4 how Sraffa makes use of the 'physical' rate of profits of the Standard system to refute the 'price theories of profit' that he attributes to Smith, Malthus and Böhm-Bawerk. Finally, to complete our discussion, we deal, in section 5, with the role of the Standard commodity for the determination of the rate of profits of the 'actual system', as emerging from chapters IV and V of *Production of Commodities by Means of Commodities*. Conclusions are drawn in section 6.

2. The manuscripts of 1955 and 1956

As reported in the Preface to *Production of Commodities*, Sraffa began to 'put together' the pages of his book in 1955 on the basis of a mass of notes accumulated between the late 1920s and the 1940s. As a preliminary step in that direction, in January 1955 he composed a document entitled 'Buone Idee' (Good Ideas), which is essentially a list of notions and analytical points to be elaborated in the book. An entry on this list concerns the '*q*-system'– namely, the system that allows the determination of both the Standard ratio and the multipliers for the construction of the Standard system[2] – and reads as follows:

> Q system: "physical" rate of profit.
> No prices can affect it: Malthus, Böhm-B. (this is a good vantage point to appreciate them) {D3/12/49:1r, dated 31.1.1955}

The notion of a 'physical' profit rate that 'no prices can affect' mentioned in the foregoing passage is illustrated in more detail in later manuscripts dealing with the Standard system. In particular, in a document included in the folder titled 'Discard (almost certainly) Summer 1955', Sraffa addresses the distribution of the net product of the Standard system and writes:

> Imagine that a proportion, say ¼, of the net product of the S.S. is allotted to labour, so that the wage consists of a quantity of Standard Commodity. What is left over of the net product for distribution as profits will therefore also be composed of S.C.; and if the

[2] Cf. Sraffa (1960), pp. 23–24. Cf. also section 3.1, equations (4) and (5), in the present paper.

> whole net product was at the rate of 20% of the means of production, ¾ of it, being still of the same commodity composition as they are, will be at the rate of 15%. … And generally, … the rate of profits at the various levels of $\underline{w}$ will be $\underline{r} = R(1 - \underline{w})$. Individual prices will move in all directions with the variation of $\underline{w}$, but here again prices will make no difference: $\underline{r}$ *is a ratio between two quantities of the same comp. comm.,* ~~it is independent of prices,~~ *and can actually been discovered before knowing what those prices are. The rate of profits is "embedded in the things" and no manipulation of prices could ever affect it.* [*There could be no more tangible evidence* (*convincing proof*) *of the rate of profits being a non-price phenomenon* (*effect*)]
>
> [The rate would seem (appears, is seen) to be "embedded in the things", so that {no} manipulation of prices could ever affect it. Thus the Standard System provides tangible evidence of the rate of profits being a non-price phenomenon] {D3/12/53: 32r, italics added}[3]

If we examine the italicised part of this long quotation, we see that it basically consists of three statements. On the assumption that the wage is paid in Standard commodity, Sraffa first asserts that at any given wage level, the rate of profits manifests itself in the Standard system as the ratio of two well-defined quantities of Standard commodity. We refer to this initial assertion as statement A. Sraffa then derives two consequences from this premise. The first is that, given the wage, the rate of profits can be identified in the Standard system before knowing the commodity prices (statement B). The second is that insofar as it is embedded 'in the things' (the technical production conditions and the wage paid in Standard commodity), the rate of profits emerging from the Standard system cannot be altered by 'manipulations of prices' and, for this reason, can be regarded as a non-price phenomenon. We refer to this last assertion, which is repeated in the final part of the quotation within square brackets, as statement C.

It should clearly appear that statements B and C are closely related to the slogans under discussion in this paper. Statement C, with its reference to hypothetical 'manipulations of prices', gives us an indication of the reason that, according to Sraffa, justifies the slogan 'The Standard System provides tangible evidence of the rate of profits being a non-price phenomenon'. Statement B, on the other hand, is connected to the second slogan.

Statement B also appears in another document plausibly written in 1955, in which it is followed by a more explicit formulation of statement C:

> {In} the St. Syst., given the wage, we can deduce (spot, identify) the rate of profit without need of knowing the prices. Indeed, we see that even if arbitrary, fancy prices [whatever mad prices] were given to all commodities … , no prices however mad would change the

[3] Regarding the last part of this quotation within square brackets, it should be noted that the word 'no' is not clearly legible in the original manuscript, but it is, however, perfectly visible in an earlier draft of the document – cf. D3/12/53:33r.

> rate. No more tangible evidence could be had (expected) of the rate of profits as a non-price phenomenon – contrary to the recurrent (old established and persistent, hard dying) notion from A. Smith onwards of its being due to an addition to the price of the products [Malthus, Bohm, …] {D3/12/57:17r-18r}

The second sentence in this passage makes it clearer what Sraffa meant in the previous long quotation when asserting that no 'manipulations of prices' can affect the 'physical' rate of profits that emerges from the Standard system – his point is that the profit rate in this system cannot be altered even by arbitrarily changing the prices of commodities. Then, on the basis of this remark, Sraffa concludes again that the Standard system provides concrete evidence of the rate of profits as a non-price phenomenon. Finally, he takes up a point just hinted at in the entry quoted at the beginning of this section and contrasts this conclusion with the view conveyed by the works of Smith, Malthus and Böhm-Bawerk, according to which the rate of profits stems from an 'addition' to the prices of commodities.

For the purpose of our discussion, it is useful to examine a further manuscript, written in August 1955, which begins with a summary of the results obtained by using the *q*-system (D3/12/68: 20–23, dated 28–30.8.55). One of the results reported is that, insofar as it is used for the construction of the Standard system,

> {the *q*-system} gives a tangible demonstration (proof) that the rate of profits is not (fundamentally, essentially) a price phenomenon {*two variants added here:* 'does not arise from an addition to the price of product over that of the raw materials etc.', 'does not arise outside the sphere of prod.'}. [This refutes the widespread opinion that profit arises from adding something on to the price of the end-product. Malthus is perhaps the most explicit supporter of this view; but the picture of a linear (straight-line) (as opposed to a circular) production process, which begins with "factors of production" and ends in "consumption goods" provides ideal conditions for a "price" theory of profit] {D3/12/68: 20}

We see that Sraffa considers two ways in which the assertion that the rate of profits is a non-price phenomenon could be reformulated – namely, by stating that it 'does not arise from an addition to the price of product over that of the raw materials, etc.' or that it 'does not arise outside the sphere of production'. Moreover, in refuting the view that profits originate from 'adding something on' to the prices of final products, Sraffa interestingly remarks that the conception of production as a process starting with factors of production and ending with consumption goods provides optimal conditions for a 'price theory of profit'.

Passages linked to the slogans also appear in other documents dealing with the Standard system that Sraffa composed in 1955 and in the first part of 1956, but they add nothing substantial to what we have already reported. To complete our examination of the manuscripts,

it should be noted that in a document dated 25 August 1956, which is a draft of the first chapters of his book, Sraffa did *not* include the two assertions closely related to the slogans that we have called statements B and C.[4] Moreover, no trace of either assertion seems to be present in the unpublished papers that can safely be ascribed to later dates.

To recapitulate, it has been shown in this section that the two slogans not used in *Production of Commodities* synthesise an argument articulated in three distinct statements: 'With the wage paid in Standard commodity, the rate of profits appears in the Standard system as the ratio of two quantities of the same commodity' (statement A); this means that 'the rate of profits can be identified in the Standard system before knowing the prices of commodities' (statement B) and, moreover, that 'the rate of profits emerging from the Standard system is not affected by manipulations of prices and can therefore be seen as a non-price phenomenon' (statement C). Since these statements are not immediately obvious, in the following sections we endeavour to reconstruct their meaning.

3. The Standard system and the rate of profits

In this section, we examine the meaning of Statements A and B by making use of the analysis developed by Sraffa in *Production of Commodities*. Our aim is to highlight the explicit and implicit assumptions underlying these statements and, moreover, to clarify the differences in meaning between them.

We consider an 'actual economic system' with M commodities, single production, no fixed capital and no natural resource available in limited amount. For a commodity i (with $i = 1, 2, \ldots, M$) a method of production is:

$$X_{1,i} \oplus X_{2,i} \oplus \cdots \oplus X_{M,i} \oplus L_i \rightarrow Y_i$$

where Y_i is the gross output of commodity i obtained at the end of the production cycle, while $X_{m,i}$ and L_i are the employment of commodity m (with $m = 1, 2, \ldots, M$) and labour in this process. Following Sraffa (1960, p. 10), we assume: $\sum_{i=1}^{M} L_i = 1$.

[4] Cf. D3/12/72, 'Copy used for second typing', and in particular pages 5f.18–5f.33 dealing with the Standard system.

For the argument presented in this section, it is useful to recall the distinction between two notions of profit rate: (i) the *general* or *average* rate of profits, which we denote by r_G; (ii) the *uniform* rate of profits, denoted by r_U. For a given wage rate w – paid post-factum – and a price vector $\mathbf{p} = [p_1, p_2, \dots, p_M]$,[5] the general rate of profits is the ratio of the total amount of profit to the investment of capital in the whole system:

$$r_G = \frac{\sum_{i=1}^{M}(p_i Y_i - \sum_{m=1}^{M} p_m X_{m,i} - wL_i)}{\sum_{i=1}^{M}(\sum_{m=1}^{M} p_m X_{m,i})} \tag{1}$$

The general rate of profits can also be understood as a weighted average of the sectoral rates. Let us define the sectoral rate of profits as the ratio between the amount of profit and the investment of capital in the industry of commodity i (with i = 1, 2, ..., M):

$$r_i = \frac{p_i Y_i - \sum_{m=1}^{M} p_m X_{m,i} - wL_i}{\sum_{m=1}^{M} p_m X_{m,i}} \tag{2}$$

then $r_G = \sum_{i=1}^{M} r_i k_i$, where k_i is the share of capital invested in sector i.[6]

With arbitrary prices, different sectoral rates emerge in different industries. There is, however, one special price vector $\mathbf{p}^* = [p_1^*, p_2^*, \dots, p_M^*]$ such that, for a given wage rate w, an equal rate of profits is earned in every industry. Since this equality cannot take place without the price vector $\mathbf{p}^*$ – that is, the vector of natural prices[7] – the uniform rate of profits must necessarily be defined jointly with the natural-price vector $\mathbf{p}^*$ by means of a system of M equations:

$$r_U = \frac{p_i^* Y_i - \sum_{m=1}^{M} p_m^* X_{m,i} - wL_i}{\sum_{m=1}^{M} p_m^* X_{m,i}}, i = 1, 2, \dots, M \tag{3}$$

As the general rate is the weighted average of the sectoral rates, the natural-price vector $\mathbf{p}^*$ brings about the equality $r_G = r_U$.

[5] As in Sraffa's analysis, we do not consider the possibility that relative prices vary with the delivery date of commodities. This possibility concerns the modern neo-Walrasian approach only.

[6] The weight k_i is the ratio between the investment of capital in sector i, namely $\sum_{m=1}^{M} p_m X_{m,i}$, and the total investment of capital in the system, namely $\sum_{i=1}^{M}(\sum_{m=1}^{M} p_m X_{m,i})$.

[7] As is known, in the classical approach, the vector of natural prices represents the centre around which actual prices tend to 'gravitate' because of free competition among capitalists.

Having introduced these different notions of profit rate, we argue in the following sub-sections that statement A refers to the general rate of profits, whereas statement B refers to the uniform rate.

3.1 The Standard system and the general rate of profits

The 'Standard system' is a special construction in which the physical net product and the aggregate of the means of production consist of the same commodities, taken in the same proportions. In mathematical terms, denoting by $\mathbf{Y}^S = [Y_1^S, Y_2^S, \dots, Y_M^S]$ and $\mathbf{X}^S = [X_1^S, X_2^S, \dots, X_M^S]$ the vectors of quantities that represent, respectively, the gross product and the means of production of the Standard system, there must be a scalar R – named the 'Standard ratio' – such that $\mathbf{Y}^S - \mathbf{X}^S = R\mathbf{X}^S$,[8] or, equivalently, $\mathbf{Y}^S = (1+R)\mathbf{X}^S$.

The Standard system is built from the actual system by proper reproportioning of industries, without altering the total employment of labour. Following Sraffa, we denote by $\mathbf{q} = [q_1, q_2, \dots, q_M]$ the vector of multipliers that transforms the quantities of the actual system into those of the Standard system, namely: $Y_i^S = Y_i q_i$ and $X_i^S = \sum_{m=1}^{M} X_{i,m} q_m$ (with $i = 1, 2, \dots, M$). The multipliers $\mathbf{q}$ and the Standard ratio R are determined together, by solving the 'q-system' (Sraffa 1960, p. 24):

$$Y_i q_i = (1+R) \sum_{m=1}^{M} X_{i,m} q_m \,, \forall i = 1, 2, \dots, M \tag{4}$$

$$\sum_{i=1}^{M} L_i \, q_i = 1 \tag{5}$$

Sraffa considers the net product $\mathbf{Y}^S - \mathbf{X}^S$ as one unit of a composite commodity: the 'Standard commodity.' Accordingly, because $\mathbf{Y}^S - \mathbf{X}^S = R\mathbf{X}^S$, the vector of the means of production $\mathbf{X}^S$ corresponds to $1/R$ units of Standard commodity. In this way, the net product and the means of production of the Standard system become two quantities of the same composite commodity, so that R can now be understood as 'the ratio of the net product to the means of production of the {Standard} system' (Sraffa 1960, p. 21).[9]

[8] In mathematical terms, the net product and the means of production of the Standard system must be collinear vectors. Two generic vectors $\mathbf{v}$ and $\mathbf{u}$ are collinear if and only if there is a scalar $\delta \neq 0$ such that $\mathbf{v} = \delta\mathbf{u}$.

[9] Sraffa indeed points out that '[t]he possibility of speaking of a ratio between two collections of miscellaneous commodities … arises of course from the circumstance that both collections are made up in the same proportions—from their being in fact quantities of the same composite commodity' (1960, p. 21).

Once R is understood as a ratio between two quantities of Standard commodity, Sraffa maintains that the same holds for the rate of profits of the Standard system, provided that wages consist of Standard commodity:

> Now suppose the Standard net product to be divided between wages and profits, *taking care that the share of each consists always, as the whole does, of Standard commodity*: the resulting rate of profits would be in the same proportion to the Standard ratio of the system as the share allotted to profits was to the whole of the net product. {Sraffa 1960, p. 21, italics added}

Hence, first, assuming that wages are paid in physical terms, by a certain fraction of the net product of the Standard system, the total amount of profit can also be expressed in physical terms as the residual fraction. As a result, the *general rate of profits* of the Standard system r_G^S can be determined as a ratio between two quantities of Standard commodity. This is precisely the meaning of statement A.

Second, as Sraffa writes, the resulting rate of profits is in the same proportion to the Standard ratio as the share of profit is to the net product of the Standard system. To develop this point, let us denote by w^S the share of the Standard net product devoted to the payment of wages. Total wages thus amount to $(\mathbf{Y}^S - \mathbf{X}^S)w^S$ – namely, to w^S units of Standard commodity.[10] For a price vector $\mathbf{p} = [p_1, p_2, \dots, p_M]$, the value of what is given to workers is $\mathbf{p} \cdot (\mathbf{Y}^S - \mathbf{X}^S)w^S$ and the total amount of profit is $\mathbf{p} \cdot (\mathbf{Y}^S - \mathbf{X}^S)(1 - w^S)$, where $(1 - w^S)$ is the share of the Standard net product allotted to capitalists. The *general rate of profits* of the Standard system is therefore:

$$r_G^S = \frac{\mathbf{p} \cdot (\mathbf{Y}^S - \mathbf{X}^S)(1 - w^S)}{\mathbf{p} \cdot \mathbf{X}^S} = \frac{\mathbf{p} \cdot (R\mathbf{X}^S)}{\mathbf{p} \cdot \mathbf{X}^S}(1 - w^S) = R(1 - w^S) \qquad (6)$$

That is, it is $(1 - w^S)$ times the Standard ratio R.

As regards equation (6), it is worth stressing that – once wages are assumed as paid in Standard commodity – the equality $r_G^S = R(1 - w^S)$ holds independently of the commodity adopted as numéraire. As Sraffa (1960, p. 22) writes, because it is a ratio between two quantities of the same commodity, r_G^S is completely independent of the price vector $\mathbf{p}$, and this

[10] Note that, under the particular assumptions posited by Sraffa, the same number w^S (with $0 \leq w^S \leq 1$) expresses both the share of the net product of the Standard system allotted to workers, and the wage rate in terms of Standard commodity.

also means that it does not depend on the numéraire commodity in terms of which prices are measured.

3.2 The Standard system and the uniform rate of profits

As we have just shown, statement A affirms that the *general rate of profits* of the Standard system is a ratio between two quantities of Standard commodity. This, in turn, trivially implies that r_G^S is not affected by commodity prices. Consequently, if statement B – according to which the profit rate of the Standard system can be 'announced' before knowing prices – referred to r_G^S, then it would actually be a tautological implication of statement A. Hence, it is only with reference to the *uniform rate of profits* that statement B becomes a distinct proposition, with its own meaning and requiring a non-trivial proof.

Given the vector of multipliers **q**, which convert the actual system into the Standard one, and a price vector **p**, the price of one unit of Standard commodity p_S can be defined as follows:

$$p_S \equiv \sum_{i=1}^{M} p_i \left(Y_i q_i - \sum_{m=1}^{M} X_{i,m}\, q_m \right) \tag{7}$$

Hence, adopting definition (7) and continuing to denote by w^S the wage rate in terms of Standard commodity, the uniform rate of profits of the Standard system r_U^S and the associated natural-price vector $\mathbf{p}^*$ are defined by the following system of *M* equations:

$$r_U^S = \frac{\left(p_i^* Y_i - \sum_{m=1}^{M} p_m^* X_{m,i} - p_S^* w^S L_i\right) q_i}{\left(\sum_{m=1}^{M} p_m^* X_{m,i}\right) q_i}, i = 1, 2, \dots, M \tag{8}$$

Once a commodity is taken as numéraire – be it the Standard one or any other commodity – equations (7) and (8) form a system allowing the determination of the natural-price vector $\mathbf{p}^*$ and the uniform rate of profits r_U^S. Nonetheless, r_U^S can be announced before the natural prices are known. In fact, as already stressed, when commodity prices are at their natural levels $\mathbf{p}^*$, the general and the uniform rates of profits coincide. This means that once a wage rate level w^S is fixed and the corresponding general rate of profits r_G^S is determined, the uniform rate r_U^S is also known. Precisely: $r_U^S = r_G^S = R(1 - w^S)$. It should be noted, however, that while the relation $r_G^S = R(1 - w^S)$ only requires that wages are paid in Standard commodity, the equality $r_U^S = r_G^S$ also requires that, for every possible level of w^S, prices are

always adjusted at their natural levels. However, the commodity adopted as numéraire is irrelevant in both cases.

In light of what has been argued in this section, we can conclude that: (i) statement A refers to the general rate of profits; and (ii) statement B is an implication of statement A and refers to the uniform rate.

4. Smith, Malthus, Böhm-Bawerk and the 'price theory of profit'

As seen in section 2, Sraffa remarks in the manuscripts that the rate of profits in the Standard system is not affected by price manipulations and thereby qualifies as a non-price phenomenon (statement C); he affirms that this fact refutes the view – held, for example, by Smith, Malthus and Böhm-Bawerk – that 'profit arises from adding something on to the price of the end-product'. In this section, we first clarify this view on the origin of profit by examining the elements in support of it that appear in the writings of the three authors mentioned by Sraffa. Then, in light of this examination, we delve into the meaning of statement C.

As regards Adam Smith, it should be noted that a well-known argument in chapter VI of *The Wealth of Nations* favours the view of profits as being due to a rise in commodity prices – or, to use Sraffa's expression, to an addition to the prices of products. In particular, Smith argues in the first part of this chapter that while, in primitive systems, the 'real' prices of commodities (that is, the prices in labour commanded) are regulated by the quantity of labour required for their production (1776, I.vi, p. 65), in capitalist economies:

> the quantity of labour commonly employed in acquiring or producing any commodity {is not} the only circumstance which can regulate the quantity {of labour} which it ought commonly to … command ... *An additional quantity … must be due for the profits of the stock which advanced the wages and furnished the materials of that labour*. {Smith 1776, I.vi, p. 67; italics added}

As Ricardo noticed in a letter to James Mill, which Sraffa quotes with some emphasis in the Introduction to the Ricardo edition, Smith is in fact asserting that the need to pay for profits prompted a rise in the prices of products[11] – and this assertion, in turn, promotes the view that

[11] The relevant part of the passage reads as follows: 'I … oppose … Adam Smith thought, that as in the early stages of society, all the produce of labour belonged to the labourer, and as after stock was accumulated, a part went to profits, that accumulation, necessarily … *raised* the prices … of commodities ...' (Ricardo to J. Mill, 28.12.1818, quoted in Sraffa 1951, pp. xxxvi-xxxvii; Sraffa's italics).

profit *originates* from such a price rise. The same view is conveyed more explicitly by a further passage of chapter VI:

> As soon as stock has accumulated …, some {persons} will naturally employ it in setting to work industrious people, whom they will supply with materials and subsistence, in order to make a profit by the sale of their work. … *In exchanging the complete manufacture either for money, for labour, or for other goods, over and above what may be sufficient to pay the price of the materials, and the wages of the workmen, something must be given for the profits of the undertaker of the work who hazards his stock in this adventure.* {Smith 1776, I. vi, p. 66; italics added}

The italicised part of this quotation suggests that profits have their origin in the realm of the exchange of commodities, where they are created by raising the selling price of finished products above the price of the inputs employed in their manufacture. This conception of the origin of profit, we may finally note, emerges again in chapter IX, when Smith argues that the state of accumulation influences profits precisely by regulating the extent to which capitalists can raise the selling prices relative to the price of inputs. Consider, for example, what he writes concerning the effect of a declining capital stock in the economy:

> The diminution of the capital stock of the society … as it lowers the wages of labour, so it raises the profits of stock … By the wages of labour being lowered, the owners of what stock remains in the society can bring their goods at less expense to market than before, and less stock being employed in supplying the market than before, they can sell them dearer. Their goods cost them less, and they get more for them. Their profits, therefore, {are} augmented at both ends {Smith 1776, I. ix, p. 110–111} [12]

The view of profit as being due to the excess of the price at which the product is sold over the price of the inputs employed is also present in Malthus, who maintains that the excess crucially depends on the level of the selling price as established by the 'state of demand and supply' in the market. For example, in *The Measure of Value* (1823), Malthus asserts that the capitalist's advances in the production of any commodity consist of the wages paid to the labour directly and indirectly required (pp. 17–19) and then, measuring the value of products and wages in labour commanded, argues as follows:

> profits … are determined … by the variable value of the commodities produced by a given quantity of labour, compared with the constant value of such labour; and … profits never, on any occasion, rise or fall, unless the value of the produce of a given quantity of labour rises or falls, either from the temporary or ordinary state of the demand and supply. {Malthus 1823, pp. 55–56}

[12] A symmetric argument is put forward, in less explicit terms, for the case of an increasing capital stock - cf. Smith 1776, I.ix, p. 105.

With the phrase 'constant value of such labour', Malthus means the *value in labour commanded of the wages* paid to the given quantity of labour employed in production.[13] He is therefore arguing that profits are determined by the value in labour commanded of the products obtained by employing a certain quantity of direct and indirect labour – a value that varies with changes in the conditions of supply and demand – compared with the value in labour commanded of the wages advanced to that labour. This idea of profits as stemming from the excess of the selling price of the product over the value of the capitalists' advances, with the excess ultimately depending on the state of supply and demand, is confirmed in Malthus's last work, the second edition of the *Principles of Political Economy* (1836), in which values are primarily expressed in money and not in labour commanded. Consider, for example, what Malthus writes as regards the profits obtainable from a given amount of capital advances:

> ordinary profits {are} determined by the ordinary state of the supply compared with the demand of the produce of the same value of capital. If the outlay of £ 100 for a year will obtain a produce which, on an average of ten or twelve years, sells for £ 120, the ordinary rate of profits will be 20 per cent. If at a future time the produce of the same value of outlay sells on an average during a similar period for £ 110, the ordinary rate of profits will be 10 per cent. {1836, p. 290}

To conclude our review, let us examine the theoretical explanation of the origin of profits that Böhm-Bawerk puts forward in *The Positive Theory of Capital* (1891, VI. ii). This explanation relies on two propositions. The first is that the means of production currently available are 'future commodities', in the sense that a complex of inputs available in the present that makes it possible to obtain Y_m units of the consumption good *m* in *t* years is economically equivalent to Y_m units of *m* available in *t* years.[14] The second is that individuals, taken as a whole, tend to attribute to the goods available in the future a lower value than that attributed to the same goods available in the present (1891, V). According to Böhm-Bawerk, from these propositions it follows that the price of the inputs to be employed in any time-consuming production process

[13] Throughout *The Measure of Value*, Malthus illustrates the concept of the 'constant value of labour' by showing, through examples, that the value in labour commanded of the wages paid for a given quantity of labour is 'constant' in the sense of being invariant with respect to changes in both the physical wage and the production conditions of wage goods (cf., in particular, the detailed discussion based on a numerical table on pp. 36–45). As remarked by De Vivo (2012, p. 108), it was therefore not clear to Malthus that the labour commanded by the wages of *N* men is always *N* by definition. De Vivo also points out that Ricardo himself failed to realise that what Malthus intended to 'prove' through his examples is just a truism (2012, p. 111).

[14] '[The means of production], although, materially, present commodities, are, economically *future* commodities. As present commodities, they are incapable of satisfying human want; they require first to be changed into consumption goods; and since this process … takes time, they can only render their services to the wants of a future period … In this respect, then, …present productive goods are similar to future consumption goods; their utility is a future utility; they are "future commodities"' (Böhm-Bawerk 1891,VI.ii, pp. 299–300).

is necessarily lower than the price at which the corresponding future output will be sold. This argument is exemplified in the following passage of *The Positive Theory of Capital*:

> The group of productive instruments from which we get one hundred bushels of corn, has exactly the same importance for the satisfaction of our wants as the hundred bushels of corn into which it is transformed. But these hundred bushels … are still, for the time, a hundred *future* bushels, and … future goods are worth less than present goods. A hundred future bushels are, therefore, worth, we may say, only as much as ninety-five present ones. From this it follows that the Means of Production also, *if estimated against present goods*, are found of less value than the amount of … final products which can be made out of them. Our group of productive instruments which, in a year's time, will furnish us one hundred quarters of grain, is equal in value to one hundred quarters of *next* year's grain; but, like that grain, is equal to … only ninety-five quarters of *this* year's grain. Or, if we translate the whole matter into terms of money economy, and assume that, next year, the quarter of corn will be worth twenty shillings, then our group of productive materials … is equal in value to £ 100 next year, but to no more than £ 95 now. *If, then, we buy … these means of production now, we buy them for a smaller number of pounds sterling then they will bring their owner in the future.* {Böhm-Bawerk 1891, VI.ii, pp. 300–301; italics in the last sentence added}

From this it appears that, in Böhm-Bawerk's view, profit originates from the positive difference that establishes itself between the price at which the finished product is marketed and the price of the inputs used, due the tendency of the community to value future goods less than present ones. We can therefore say that in Böhm-Bawerk's theory as well, profits stem from an increase in the price of the end-product above the input price.[15]

In light of the examination carried out so far, we can understand more precisely the meaning of statement C. As has been seen, scholars as diverse as Smith, Malthus and Böhm-Bawerk share the view that profits arise in the sphere of commodity exchange, where they are created by 'adding something on' to the prices of the end-products – that is, by selling the products at prices that exceed the price of the inputs employed. This view, in turn, leads to the conclusion that the rate of profits essentially depends on the extent to which selling prices will tend to exceed the price of inputs, and, in this sense, is a 'price phenomenon.' By contrast, statement C points out that this conclusion cannot be true in the Standard system, because in this system the general rate of profits, with which the uniform rate necessarily coincides, is determined irrespective of prices, as the ratio of two quantities of the same commodity that depend exclusively on production conditions and the share of net product accruing to the

[15] Shortly after the passage quoted in the text, Böhm-Bawerk asserts that during the course of time-consuming production processes, entrepreneurs fundamentally transform the initial 'future commodities' (the inputs) into commodities of higher exchange value (the finished consumption goods), and then affirms: '*The increment of value* is the profit of capital' (1891, VI.ii, p. 302; italics added).

workers. It is also evident that, in the Standard system, the emergence of a positive uniform rate of profits is closely linked to the presence of a physical net product. As Sraffa indicates to the attentive reader in the first chapters of his book, this link is not specific to the Standard system but holds more generally, even if in some cases in an indirect form.[16]

4.1 The marginalist approach as optimal environment for a 'price' theory of profit

To complete this section, we shall briefly discuss a remark by Sraffa reported in section 2, namely that 'the picture of a linear … (as opposed to a circular) production process, which begins with "factors of production" and ends in "consumption goods" provides ideal conditions for a "price" theory of profit' (D3/12/68: 20). Here Sraffa is evidently referring to what he will later call 'the view of the production process as a one-way avenue' (1960, App. D, p. 93). To interpret his remark, it is useful to take into account a passage from the unpublished manuscripts in which Sraffa highlights a central aspect of 'linear' (one-way) production processes:

> Jevons, B-B, J.B. Clark and their followers … believe … that commodities composing capital are "ultimately" produced by the labourer with his bare hands out of nothing – without need of tools or raw materials: where "ultimately" stands for a finite number of steps (e.g. cotton yarn is produced by labour and machinery {and} raw cotton: but the machines are made, {and} the r. cotton grown, by labour alone). {D3/12/15: 9}

Here Sraffa attributes to a large group of marginalist authors the conception that every individual commodity is produced either with labour alone or through a process composed of a finite number of stages unfolding consecutively in time: in the initial stage, a specific capital good (possibly composite) is produced with labour alone; in the second, a further quantity of labour transforms that capital good (or complex of capital goods) into another specific capital good (in turn, possibly composite), and so on, until a final stage of production is reached from which the commodity under consideration emerges as a finished product. As we shall now

[16] Consider chapter I and the first part of chapter II of *Production of Commodities*. In the main text, Sraffa focuses his analysis on self-replacing economies and distinguishes them into two classes, those which limit themselves to reproducing the means of production consumed and those which instead display a physical net product (as he includes the workers' subsistence among the means of production at this stage, the physical net product corresponds exactly to the 'surplus' of the old classical economists). By examining the systems of price equations characterising each class, and in particular, the number of independent equations, he clarifies in paragraphs 3–4 that a positive uniform rate of profits may arise in the second class of economies but not in the first (cf. Ciccone 1998, pp. 447–48, for an illustration of this point). Moreover, Sraffa points out in the footnote appended to chapter I that the arguments put forward for the economies in a self-replacing state also apply to those that can be reduced to this state by taking the price equations in different proportions. In this way, he signals to the reader that a positive uniform rate of profits may also arise in non-self-replacing economies, provided that they be capable of displaying a physical net product when the price equations are reproportioned.

argue, this conception of production processes has relevant implications for the interpretation of Sraffa's remark.

Consider any composite commodity formed by fractions of the *M* quantities of distinct commodities that constitute the social product of the economy in a given year. If each of these *M* quantities was ultimately produced through a process consisting of a finite number of stages, the generic composite commodity formed as said will also necessarily have been produced in a finite number of stages,[17] which excludes that it may have been used as a direct input in the production of itself. This in turn means that it cannot exist a 'miniature' production system, obtained by taking fractions of the *M* industries of the actual economy, whose output consists of a composite commodity that enters directly its own production (contrary to what occurs in the case of 'circular' production – cf. Sraffa, 1960, pp. 19–20). Considering that the Standard commodity is produced by means of itself and labour, it therefore emerges that no miniature Standard system can be identified within an economy characterised by 'linear' (one-way) production processes, and this in turn proves that the Standard system cannot be constructed in any such economy. Returning now to the remark under discussion, we may plausibly conjecture that Sraffa identified in this implication of the linear (one-way) representation of production processes the 'ideal conditions for a "price" theory of profit': by preventing the construction of the Standard system, this representation precludes the conception of the general profit rate as the ratio of two quantities of the same commodity and thus makes the theorist free to regard the rate of profits, in the analysis of distribution, as a 'price phenomenon'.

[17] Suppose, for example, that the quantity Y_i^t of commodity *i* available at *t* and the quantity Y_j^t of commodity *j* available at *t* were produced through the following processes in successive stages:

$$L_i^{t-3} \rightarrow \mathbf{X}_i^{t-2}, \mathbf{X}_i^{t-2} \oplus L_i^{t-2} \rightarrow \mathbf{X}_i^{t-1}, \mathbf{X}_i^{t-1} \oplus L_i^{t-1} \rightarrow Y_i^t$$
$$L_j^{t-2} \rightarrow \mathbf{X}_j^{t-1},\ \mathbf{X}_j^{t-1} \oplus L_j^{t-1} \rightarrow Y_j^t$$

where the elements in bold type denote non-zero vectors of quantities of capital goods and, of the quantities of labour indicated, at least L_i^{t-3} and L_j^{t-2} are strictly positive. In these conditions, we can affirm that the composite commodity $Y_i^t \oplus Y_j^t$ available at *t* was produced through the following three-stage process:

$$L_i^{t-3} \rightarrow \mathbf{X}_i^{t-2}, \mathbf{X}_i^{t-2} \oplus (L_i^{t-2} + L_j^{t-2}) \rightarrow (\mathbf{X}_i^{t-1} + \mathbf{X}_j^{t-1}), (\mathbf{X}_i^{t-1} + \mathbf{X}_j^{t-1}) \oplus (L_i^{t-1} + L_j^{t-1}) \rightarrow Y_i^t \oplus Y_j^t$$

and because $Y_i^t \oplus Y_j^t$ was produced in a finite number of stages, it is impossible that a part of it formed by fractions of Y_i^t and Y_j^t may have been produced in an infinite number of stages.

5. The actual system and the rate of profits

In section 3 we focused our attention on the Standard system with the aim of deepening our understanding of the meaning of statements A and B. We saw that, assuming that wages are paid with a fraction of the Standard net product, the general rate of profits r_G^S presents itself as the ratio between two quantities of the same commodity. Thus, the relation $r_G^S = R(1 - w^S)$ holds independently of any consideration concerning commodity prices. Moreover, if it is further assumed that commodity prices always stay at their natural levels, we saw that the same relation links w^S with the uniform profit rate of the Standard system r_U^S.

Now, Sraffa claims in his book that the Standard system is an auxiliary construction aimed at rendering visible hidden features of the actual system. Thus, he first points out that, under certain conditions, the linear relation between distributive variables can be extended to the actual system. Second, he argues that this relation can be used without having to construct the Standard system by means of the q-system.

To complete our discussion, we now retrace Sraffa's analysis of the two points just mentioned. As we shall see, that analysis also suggests one possible reason why Sraffa decided not to use the slogans.

5.1 The Standard commodity as numéraire and the rate of profits of the actual system

As seen in section 3, the central assumption behind statement A is that the net product of the Standard system is divided between wages and profit, 'taking care that the share of each consists always, as the whole does, of Standard commodity' (Sraffa 1960, p. 21). Hence, in the Standard system, the payment of wages in Standard commodity presents itself as a natural consequence of the hypothesis that they are paid by a fraction of the annual net product.

Differently, as far as the actual system is concerned, Sraffa considers the wage rate w in value terms, like a price (Sraffa 1960, p. 11). He initially adopts the annual net product of the actual system as numéraire (chapter II). In chapter IV, however, when addressing the extension of the linear relation between distributive variables to the actual system, Sraffa decides to express wage and prices in terms of the Standard commodity (1960, pp. 24, 25). In so doing, the wage rate w becomes a quantity of Standard commodity that can be compared with the physical wage rate paid in the Standard system w^S.[18]

[18] It is worth stressing that Sraffa distinguished between wages 'paid' or 'fixed' as a physical quantity of Standard commodity – namely a share of the Standard net product – and wages 'measured' or 'expressed' in terms of Standard commodity, when the latter is adopted as numéraire.

Hence, if w and w^S correspond to the same quantity of Standard commodity, then the uniform rate of profits of the actual system must be equal to that of the Standard system: $r_U = r_U^S$. In fact, $p_S = 1$ and $w = w^S$ make the RHS of equation (8) identical to that of equation (3). As Sraffa writes, because 'the actual system consists of the same basic equations as the Standard system … once the wage is given, the rate of profits is determined for both systems' (1960, p. 23).

Moreover, as seen in section 3, if commodity prices are at their natural level, then $r_U^S = r_G^S = R(1 - w^S)$. Hence, with the Standard commodity as numéraire, the equalities $w = w^S$ and $r_U = r_U^S$ bring about $r_U = R(1 - w)$. Sraffa concludes that the linear relation between the wage and the rate of profits holds in the actual system, too, provided that (i) commodity prices are at the natural level and (ii) commodity prices and w are measured in terms of Standard commodity.

From what has been said so far, it emerges that the relation $r = R(1 - w)$ can be read in different ways, each of which involves specific assumptions. If r is interpreted as the general rate of profits of the Standard system and w as the fraction of the Standard net product devoted to the payment of wages, then, as seen in section 3, the relation $r = R(1 - w)$ holds independently of any assumption about commodity prices. In fact, once wages are assumed to be paid by a physical quantity of Standard commodity, the general rate of profits of the Standard system is a ratio of two physical quantities of the same commodity (statement A). On the contrary, if r is regarded as the uniform rate of profits of the actual system and w as the wage rate in value terms, then the relation $r = R(1 - w)$ holds only if prices are always at their natural levels and the Standard commodity is the numéraire.

5.2 The rate of profits as the independent variable

After extending the relation $r = R(1 - w)$ to the actual system by adopting the Standard commodity as numéraire, Sraffa (1960, pp. 31–33) argues that this relation can be used directly, without passing for the solution of the q-system – that is, equations (4) and (5). Sraffa's argument is as follows. First, the ratio R can be found from the price equations as the rate of profits associated with $w = 0$.[19] Second, once R is known, the equation $r = R(1 - w)$ can be included in the system in place of the numéraire equation. In so doing, the wage w and the natural prices $\mathbf{p}^*$ are automatically expressed in terms of Standard commodity, although we do not know what this composite commodity consists of. In other terms, the relation $r = R(1 - w)$

[19] Because $w = 0$, it is not important which commodity is adopted as numéraire in order to determine R.

– with r understood as the uniform rate of profits of the actual system r_U – is equivalent to the numéraire equation $\sum_{i=1}^{M} p_i^* \left(Y_i q_i - \sum_{m=1}^{M} X_{i,m}\, q_m\right) = 1$, but the former does not require that the vector of multipliers **q** is known.

After arriving at this point, Sraffa (1960, p. 32) remarks that 'it is curious that we should thus be enabled to use a standard without knowing what it consists of.' Hence, he starts to look for 'a more tangible measure' for both commodity prices and wages. A solution seems to be at hand for prices:

> as soon as we have fixed the rate of profits, and without need of knowing the prices of commodities, a parity is established between the Standard net product and a quantity of labour which depends only on the rate of profits; and the resulting prices of commodities can be indifferently regarded as being expressed either in the Standard net product or in the quantity of labour which at the given level of the rate of profits is known to be equivalent to it. {Sraffa 1960, p. 32}

Here Sraffa points out that once the profit rate is fixed, the dose of labour commanded by one unit of Standard commodity is fixed as well, and that commodity prices can be seen as measured in terms of this dose of labour.[20] By contrast, the search for an alternative measurement appears to be an insurmountable problem with reference to wages. As Sraffa writes:

> The last remaining use of the Standard net product is as the medium in terms of which the wage is expressed—and in this case there seems to be no way to replace it. {Sraffa 1960, p. 32}

Sraffa thus tries to circumvent the problem by considering the profit rate as given, and determining the wage rate simultaneously with commodity prices.[21] In particular, he notices that, in reinterpreting the measure of commodity prices, the rate of profits was already taken as the independent distributive variable:

> The last steps of the preceding argument have led us to reverse the practice, followed from the outset, of treating the wage rather that the rate of profits as the independent variable or 'given' quantity. {Sraffa 1960, p. 33}

[20] For a given rate of profits, $1/w = R/(R - r)$ is the dose of labour that can be purchased with one unit of Standard commodity – namely with the Standard net product. As a consequence, if p_m is the price of commodity m in terms of Standard commodity, this means that one unit of m commands a number p_m of such doses of labour.

[21] Sraffa suggests that, at the given rate of profits, w could be interpreted as a pure number that defines the dose of labour $1/w$. Moreover, he points out that if p_m is the number of doses of labour that can be purchased with one unit of commodity m, then $1/p_m$ is the wage for one dose of labour in terms of commodity m (cf. Sraffa 1960, pp. 32–33).

Sraffa says that the choice of the wage as the independent variable was justified, at the beginning of *Production of Commodities*, by the assumption that it consists of a certain basket of commodities, namely 'specified necessaries determined by physiological or social conditions' (p. 33). But then, taking into account the possibility that a share of the social surplus be allotted to workers, he was prompted, in chapter II of the book, to consider the wage in value terms, and this means that it 'does not acquire a definite meaning until the prices of commodities are determined' (Sraffa 1960, p. 33). A further element of indeterminacy arises when the numéraire equation is replaced with the relation $r = R(1 - w)$, because, in so doing, the physical composition of the numéraire commodity (the Standard commodity) is left undetermined.[22] In contrast, Sraffa remarks, this problem does not arise with reference to the rate of profits, which is not an amount of value to be expressed in terms of a numéraire commodity:

> The rate of profits, as a ratio, has significance which is independent of any prices, and can well be 'given' before the prices are fixed {Sraffa 1960, p. 33}.

Once the rate of profits is taken as the exogenous distributive variable, however, it is plain that the arguments concerning its formal determination lose their meaning. This is the case of the two slogans, because, as shown in the present paper, they deal with the role played (or not) by commodity prices in determining the rate of profits. This may be one reason why Sraffa decided not to use them.

6. Conclusions

This paper sought to provide an interpretative key to the slogans that Sraffa wrote in the famous document D3/12/43:1(3). In our opinion, sound interpretation of these slogans must consider that they are the extreme synthesis of a wider reasoning, to be found in manuscripts composed by Sraffa in the period 1955–1956. We argue in section 2 that the reasoning outlined in these manuscripts can be rationalised in terms of three statements:

[22] In a document dated 25 September 1956, Sraffa writes:

> The last remaining important use that we made of … {the Standard system} was in the fixing of the wage by giving a numerical value to w; this implied that the wage was determined by outside conditions as a proportion of the Standard net product, although its composition was unknown – and this seemed an excessively unrealistic (uncommonly abstract) starting point. {D3/12/74:5r}

A. The rate of profits manifests itself in the Standard system as the ratio of two well-defined quantities of Standard commodity;
B. The rate of profits can be identified in the Standard system before knowing the prices of commodities;
C. The rate of profits emerging from the Standard system cannot be altered by 'manipulations of prices' and, for this reason, can be regarded as a non-price phenomenon.

By retracing the analysis put forward in *Production of Commodities*, we show in section 3 that statement B is an implication of statement A. More precisely, we point out that, thanks to the assumption of wages paid as a share of the Standard net product, Sraffa concludes that the general profit rate of the Standard system is a ratio of two quantities of Standard commodity. This, in turn, entails that the uniform rate of profits of the Standard system can be identified before determining prices, as the general and the uniform rate of profits must coincide at natural prices.

Statement C is also an implication of statement A, but it has a decidedly different meaning from B. As seen in section 2, Sraffa remarks in the manuscripts that the Standard system refutes the 'price theories of profit' of Smith, Malthus and Böhm-Bawerk, and the related conception of the rate of profits as a 'price phenomenon'. To clarify this assertion, we show in section 4 that the three scholars mentioned by Sraffa share the view that profits are created by selling the final products at prices that exceed the price of the inputs employed, thereby prompting the conclusion that the rate of profits ultimately depends on the extent to which selling prices tend to exceed the price of inputs. By contrast, statement C points out that this conclusion cannot be true in the Standard system, as in this system the general rate of profits, with which the uniform rate coincides, is determined regardless of prices as the ratio of two well-defined quantities of Standard commodity.

From the discussion just summarised emerges the first original result of the paper, namely that the two 'slogans not used' do not have the same meaning. The first slogan – according to which the Standard system provides tangible evidence of the rate of profits as a non-price phenomenon – is essentially equivalent to statement C, and therefore refers critically to the mentioned theories of Smith, Malthus and Böhm-Bawerk. The second relates instead to statement B, and highlights the possibility of 'declaring' the uniform rate of profits of the Standard system before knowing the natural prices of commodities.

The reconstruction of Sraffa's analysis provided in this paper also shows that the relation $r = R(1 - w)$ can be read in different ways. In section 3, we consider it within the context of the Standard system, in which, as said, Sraffa assumes that w is a share of the Standard net product. Given this assumption, with r interpreted as the general rate of profits of the Standard system, the relation under discussion holds independently of any hypothesis concerning commodity prices – in particular, it holds for any numéraire and even at prices different from the natural ones. When r is interpreted instead as the uniform rate of profits of the Standard system, the relation $r = R(1 - w)$ holds only if the exchange values of commodities correspond to the natural prices, although no specific numéraire is required for its validity. Then we move on to retracing Sraffa's extension of the relation to the actual system (section 5.1). In this regard, we point out that, when r is interpreted as the uniform profit rate of the actual system, the relation holds only on condition that exchange values correspond to the natural prices and, moreover, that the Standard commodity is the numéraire.

Hence, we can conclude that the only case in which the relation $r = R(1 - w)$ holds independently of any claim concerning prices is the first of those listed – namely, the case in which r is regarded as the general rate of profits of the Standard system and wages are assumed to be paid in physical terms by a quantity of Standard commodity.

Finally, we dwell, in section 5.2, on Sraffa's attempt to demonstrate that the Standard system is just an auxiliary construction – something one can dispense with. In particular, we recall that, in the course of this attempt, Sraffa reverses his initial procedure of taking the wage as given and begins to consider the rate of profits as the exogenous distributive variable. Once this step is taken, we argue, analysis of the role played by commodity prices in the determination of the rate of profits loses its meaning. This fact may be one of the reasons that led Sraffa not to use the slogans.

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