MARX AND THE "LAW OF VALUE". A CRITICAL APPRAISAL ON THE OCCASION OF HIS 200TH BIRTHDAY[1]

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Every opinion based on scientific criticism I welcome.
Marx, *Capital*, Volume I (1954).

ABSTRACT

The paper celebrates Karl Marx' 200th birthday in terms of a critical discussion of the "law of value" and the idea that "abstract labour", and not any use value, is the common third of any two commodities that exchange for one another in a given proportion. It is argued that this view is difficult to sustain. It is also the source of the wretched and unnecessary "transformation problem". Ironically, as Piero Sraffa has shown, prices of production and the general rate of profits are fully determined in terms of the same set of data from which Marx started his analysis.

Key words: Labour theory of value, law of value, Karl Marx, profits, transformation problem.
JEL Classification: B14, B31, B51, C30, C67.

[1] Honorary invited lecture given at the XIXth International Conference on Economic and Social Development, National Research University Higher School of Economics, Moscow, April 10-13, 2018. In this paper I draw freely on some works of mine, frequently written in collaboration with others. See, in particular, Gehrke and Kurz (2006, 2018), Kurz and Salvadori (2010), Kurz (2012, 2013) and Faccarello, Gehrke and Kurz (2016).

MARX Y LA "LEY DEL VALOR".
UNA EVALUACIÓN CRÍTICA CON MOTIVO DE SU BICENTENARIO

RESUMEN

En este artículo conmemoro el bicentenario de Karl Marx mediante una discusión crítica de la "ley del valor" y de la idea de que el "trabajo abstracto", y no ningún valor de uso, es el tercer elemento común de las mercancías que se intercambian entre sí en una proporción determinada. Argumento que es difícil sostener este punto de vista. Esto también es la fuente del infortunado e innecesario "problema de la transformación". Irónicamente, como lo demostró Piero Sraffa, los precios de producción y la tasa general de ganancia se determinan de forma completa en términos del mismo conjunto de datos a partir del cual Marx inició su análisis.
Palabras clave: teoría del valor trabajo, ley del valor, Karl Marx, ganancias, problema de la transformación.
Clasificación JEL: B14, B31, B51, C30, C67.

1. INTRODUCTION

Karl Marx, whose 200th birthday is on May 5, 2018, was a most important social scientist and philosopher, whose ideas had an impact on many disciplines, including political economy. With the fall of what was called "really existing socialism" he also fell in disrepute and repeatedly was blamed for what had happened in it. The poor man was made responsible for what he hardly could have been responsible for, having passed away in 1883. Marx was first and foremost a scientist and wished to be judged in terms of his scientific achievements. He also had strong political leanings and aspirations. Convinced that he had revealed the "law of motion" of modern society, which necessarily led to the demise of capitalism and the rise of socialism, he was keen to act as an obstetrician of a new age which would overcome the exploitation of man by man, alienation, commodity fetishism and cognitive distortions of various sorts. His scant remarks on socialism are remarkably pale and unspecific. Could anyone possibly mistake *Capital* for a handbook of the revolutionary and ruler of the socialist polity? It obviously was an attempt to come to grips with the "internal organic

coherence" and "life-process" of the "bourgeois system", its "physiology" (Marx, 1989, p. 391).

However, in Marx's analysis there is one element in particular that played a most important role not only in the intellectual discourse about his construction, but also in political struggles in which it was used as a litmus test of who held the "right belief" and who was a renegade or heretic. Marx had insisted: "The basis, the starting point for the physiology of the bourgeois system, (…) is the determination of *value by labour time*" (Marx, 1989, p. 391). Marx constructed his theory of capitalism essentially around this dictum. Yet what to him was a crucial analytical premise, politicians elevated to an article of faith.

In this paper I discuss Marx's contribution to political economy, focusing attention almost exclusively on this premise —his *first principle*, so to speak— and whether it can be sustained. Several objections to it will be raised and it will be concluded that it cannot. This negative result must not be read as implying that Marx's analysis is of no interest and worth whatsoever. Therefore, the paper discusses briefly, in Section 2, what I consider to be his main achievements, followed by what I take to be his main failures. Section 3 then explains his "law of value" —the core of his analytical construction. Section 4 turns to the starting point of Marx's investigation, the value relation as discussed by Aristotle, and what Marx found wrong with it. Section 5 puts forward a first objection to Marx's construction, which is based on the idea that "abstract labour" is *the* common third —the common element of two commodities that exchange at a given rate. It is argued that there are possibly several common thirds, which typically will be use-values, an idea Marx strictly abhored. Section 6 has a closer look at whether the concept of abstract labour is meaningful and well defined. It is argued that Marx put forward different definitions of it, which are not mutually compatible with one another. Section 7 summarizes Piero Sraffa's views on the issue of the common third, or *tertium comparationis*, and what became known as the "labour theory of value". Section 8 relates his concepts of the Standard commodity and Standard system to the problem of the common third. Section 9 contains some concluding observations.

2. MARX'S ACHIEVEMENTS AND FAILURES

a) Major achievements

Marx improved upon the received analyses of the classical economists in several respects. Most importantly, he deserves the credit for having rediscovered the classical *surplus approach to the theory of value and distribution*, from under thick layers of misinterpretation by authors he called "vulgar economists". The characteristic feature of the classical surplus approach is that it determines the distributive variables —the real wage rate (or the share of wages) and the rate of profits— not symmetrically (as contemporary advocates of demand and supply theory and later marginalist theorists), but *asymmetrically*: While the real wage rate (or share of wages) was given, the rate of profits was determined residually in terms of the surplus product that obtained after all used-up means of production and wage goods (means of subsistence) had been subtracted from gross output levels. The ratio of this surplus product and the capital advanced in the economy at the beginning of the year, consisting of means of production and means of subsistence, gives, in material terms, the general rate of profits. Since surplus product and capital advanced typically consist of partly different products, or the same products in different proportions, in order to render them comparable to one another, the different commodities have to be made commensurate, that is, expressed as values. This is where the need for a theory of value manifests itself in classical political economy —a legacy Marx inherited. We come back to this below.

Marx was keen to study both the *static* properties of an economic system as a whole at a given time and place and its *dynamic* properties over time, subjected to endogenous technical progress, the scarcity of natural resources and so on. He insisted with the Physiocrats that commodities were produced by means of commodities, that is, production was a "circular process" and not a one-way avenue that led from original factors of production (land and labour services) to final products, as Ricardo did in some of his reasoning (and Austrian economists later did throughout, following Eugen von Böhm-Bawerk). This allowed him via his concept of "constant capital" to see that the maximum rate of profits corresponding to hypothetically zero wages was finite and not infinite,

a fact Sraffa (1960, p. 94) singled out as one of Marx's major analytical achievements.

Marx's analysis was general and not partial, concerned with the interplay between the various parts that constitute the whole. He carefully distinguished between the material, the monetary and the value side of the phenomena when analysing, for example, the problems of simple and extended reproduction without and with technological change.

In his explanation of the fact that wages do not exhaust the entire net product, Marx had recourse to the specificity of the labour contract, its "openness" so to speak, and a property of the system as a whole —the generation and continual replenishment of a "reserve army of the unemployed" due to labour-saving technical progress. This reserve army kept the claims and aspirations of workers in check and was co-responsible for what Marx called the "exploitation" of the working class. He confirmed Ricardo's "fundamental law of distribution" in a circular context: The constraint binding changes in the distributive variables, especially the rate of profits (r) and the share of wages, or rate of surplus value, (w):

$$r = f(w), \text{ with } \partial r/\partial w < 0,\ 0 \leq r \leq R$$

where R is the maximum rate of profits. In Marx's labour value-based reasoning, the maximum rate of profits equals the inverse of the organic composition of capital (k). This Marx defined as the ratio of constant capital (C), that is, the amount of labour embodied in the means of production and means of subsistence, and the living labour performed during a year (L): $k = C/L$. Hence:

$$R = L/C = k^{-1}$$

His argument flew in the face of harmonious views of the capitalist society and portrayed it as conflict-ridden and crisis-prone. Marx insisted that in capitalism workers were alienated and people suffered from commodity fetishism. He (and Engels) insisted that "the ideas of the ruling class are in every epoch the ruling ideas" (Marx and Engels, 1976 [1945], p. 67), and thus foreshadowed Antonio Gramsci's concept of the "manufacture of consent". And he understood clearly that the economic, social, cultural and political systems co-evolved and were subject to an

endogenous self-transformation. In this regard he echoed the doctrine of the unintended consequences of human action, forcefully proclaimed by major representatives of the Scottish Enlightenment, most notably Adam Smith with his concept of the "invisible hand". Marx put forward a particularly radical version of this doctrine: By following their narrow self-interests, capitalists in search of ever larger profits bring about, "behind their backs", a fall in the general rate of profits and eventually a fall of the capitalist mode of production. Marx, the humanist, believed that history realizes an eschatological aim: The salvation of mankind.

So much to Marx's major achievements, as I see them. Now I turn to his failures.

b) Major failures

Marx's "successivist" approach to value and distribution —from labour values to the rate of profits and then to prices of production— as Bortkiewicz (1906-1907) called it, cannot generally be sustained. The rate of profits and prices of production can be determined only simultaneously and not sequentially. The rate of profits in price terms is different from the rate of profits in value terms. In his explanation of the law of the tendency of the rate of profits to fall Marx did not argue coherently. He assumed that the maximum rate of profits is bound to fall towards zero and with it eventually also the actual rate of profits. A vanishing maximum rate presupposes, however, an organic composition of capital that will rise without boundary from above. Yet no compelling theoretical reason can be given in support of such a rise, and empirically we do not observe it. While there were phases in which the organic composition was rising, and the time when Marx developed his analysis was such a phase, there were also phases in which it was falling. There is at any rate no long-term upward trend of the organic composition to be discerned. Nor is there a persistent long-term downward trend of the actual rate of profits to be seen. The rate of profits appears to have been a trendless variable.

Despite many criticisms he levelled at him, Marx held Ricardo in high esteem. He understood that Ricardo was possessed of great intellectual power and an admirable capacity to abstract and synthesize and was clearly a master-analyst. Marx had spotted several shortcomings of Ricardo's analysis, especially the fact Ricardo had failed to develop his

argument strictly in terms of a circular process of production. But for quite some time Marx appears to have wrongly belittled some of Ricardo's achievements, especially his treatment of the problem of the "niggardliness of nature" in the theory of rent and his treatment of technological "improvements" in the theory of capital accumulation and productivity growth. In his later years Marx appears to have continued to struggle with Ricardo's insights and to have understood that his own reasoning was perhaps difficult to sustain and at any rate not yet conclusive. The fact that he did not manage to finish volumes II and III of *Capital* I interpret *inter alia* as a sign of admitting that he could not crack the nut he had inherited from Ricardo.

In Marx we find relatively little about what constitutes a "good society" and which institutions, laws, regulations and incentive structures help to bring it about. A concern with the institutional, legal, etc. prerequisites of such a society formed the centre of the works of authors such as David Hume and Adam Smith. They elaborated their respective analyses by first developing an empirically supported anthropology designed to understand man's light and dark sides. On its basis they then established principles that were seen to be ideally suited in fostering the light sides and containing the dark ones. The result of this endeavour was, for example, Smith's concept of a "well governed society". In his view, political economy —as an important, and perhaps even the most important, part of a kind of master political science, encompassing the "science of the legislator"— has the task to overcome superstition and false beliefs in matters of economic policy, to debunk views that present individual interests as always promoting the general good and to propose regulatory frameworks for markets and institutions that help to ward off changing threats to the security of society as a whole and provide incentives such that self-seeking behaviour has also socially beneficial effects (see Kurz, 2016a). It is regrettable that Marx, apart from incidental observations, did not also take up and develop this part of the classical economists' contribution. Apparently, he was inclined to count upon a big bang that changed things fundamentally and relatively quickly and brought about a better society, in which egoism, selfishness and rapacity and the exploitation of man by man played no longer a central role and in medium terms no role at all. He could not imagine, it seems, a society jumping out of the frying pan into the fire, but was genuinely confident

that the living conditions of men could only improve after the yoke of capitalism had been shaken off. In this perspective, there was hardly any need for a code of conduct for really existing rulers in really existing socialism. He was optimistic that eventually all will end well.

We now turn to what Marx called *Wertgesetz* —"law of value". A short account must suffice, because it can be assumed that (most) people know what is the issue at stake.

3. THE "LAW OF VALUE"

The law of value, Marx insisted, does not only hold true in the "state of nature", as John Locke had contended, or in the "early and rude state of society", as we read in Adam Smith, it also holds in capitalist society, which was the most developed mode of production in history. By establishing this "law", Marx sought to show that capitalism, no less than former modes of production, was based on exploitation of one class of society, workers, by another class, the propertied class, consisting of capitalists and landowners. Since capitalist society was dominated largely by capitalists and no longer by the feudal aristocracy, his attention focused on the relationship between capitalists and workers, or the capital-labour relation. He insisted that in modern society, in which economic life was organised through interdependent markets, equivalents were exchanged. This fact did not mean, however, that there was no exploitation. It was an illusion to think otherwise. Workers got what they duly deserved under the capitalist rule, that is, the wages paid to them were equal to the value of their labour power they had sold to the employer. So how could there be exploitation?

The exchange of equivalents Marx defined in terms of the labour needed in their production or rather reproduction. He did so because he was convinced that *labour is the source*, *substance and measure of all value*. Labour generates riches, but in capitalism it also generates value. Marx prided himself with having introduced in political economy the fundamental distinction between "labour" and "labour power". The value of labour power, or "variable capital", like the value of each and every single commodity, is equal to the total amount of labour required in its production and reproduction. That is, it is equal to the value of all the commodities constituting the real wage rate needed in order to reproduce

this labour power, which necessitates the reproduction of the worker and his family. To the extent to which the worker works more hours than are socially necessary in order to reproduce his real wage, there is "surplus labour" which manifests itself in "surplus value" and eventually profits (rents and interest). Labour generates value, but is itself not part of the exploitative mechanism at work: It is the capital-labour relationship that is at the origin of social domination and control.

In order to see this, Marx was convinced, one had to study closely the *commodity*, which is the "cell form" of modern society and which has both a "use value" and an "exchange value". These two sides, he emphasized, express an unresolved tension and conflict between satisfying human needs and wants, on the one hand, and making profits, on the other. This echoes, obviously, Aristotle's contrast between the "natural" form of the acquisitive arts (*oikonomiké*), which focuses on use values, and the "unnatural" form, which serves the end of unlimited enrichment (*chrematistiké*) (see also Kurz, 2016b, chap. 1). Historically, in non-capitalist modes of production, men assessed commodities first and foremost in terms of their intrinsic use values —their objective properties to satisfy particular needs and wants. While there was exchange in ancient Greece, for example, it had not yet taken full possession of the economy, and exchange value therefore was accidental rather than reflecting some fundamental forces at work. For this reason, Marx argued, the focus of Aristotle's analysis was on use value. In capitalist society, however, chrematistics rules the roost and exchange is well established through interdependent markets: It is the dominant coordination mechanism of numerous processes of production and consumption and of the corresponding social division of labour. Exchange value is regulated by economic law and no longer reflects accident and even caprice. Exchange value in capitalist markets, Marx was convinced, expresses the "true" value of commodities.

He tried to establish this proposition in the following, well-known way. When two things are exchanged for one another in a given proportion, he argued, there must exist, "*in equal quantities something common to both. The two things must therefore be equal to a third, which in itself is neither the one nor the other*. Each of them, so far as it is exchange-value, must therefore be reducible to this third" (Marx, 1954, p. 45; emphasis added). This is the famous doctrine of the existence of a *tertium comparationis*, which to Marx is a logical implication of his vivisection of

commodities. As early as *The German Ideology* of 1845 he and Engels spoke of money as the *tertium comparationis* of all men and things. In *Capital* Marx explained: "As use-values, commodities are, above all, of different qualities, but as exchange-values they are merely different quantities, *and consequently do not contain an atom of use-value*" (Marx, 1954, p. 45; emphasis added). He went on:

> If then *we leave out of consideration the use-value of commodities* [A], they have only one common property left, that of being products of labour. (…) Along with the useful qualities of the products themselves, *we put out of sight both the useful character of the various kinds of labour embodied in them, and the concrete forms of labour* [B]; there is nothing left but *what is common to them all*; all are reduced to one and the same sort of labour, *human labour in the abstract* (Marx, 1954, pp. 45-46; emphases added).

This reasoning is highly suggestive, at least at first sight, and generations of readers appear to have accepted it (or should I say: Have fallen victim to it, including the author of this paper when reading the above passages for the first time at a young age?). It forms the core of Marx's entire analytical enterprise. All the rest follows from it: His accounting in terms of labour time in the rest of *Capital*, his interpretation of socio-economic history in terms of the labour value-based analytical apparatus he elaborated, the so-called "transformation problem" of labour values in prices of production, and so on.

While highly suggestive, is the reasoning also convincing?

It is based on two crucial *commandments*, numbered [A] and [B] in the quotation. These request the reader "to leave out of consideration" the use values of commodities and to "put out of sight" the useful character and concrete forms of labour. In short, the reader is asked to ignore both the *heterogeneity* of commodities and that of labour. No (to me) compelling reason is given in support of these commandments. As will be argued below, it is also not clear what, precisely, is meant by them. But whichever meaning is given to each of them, the implications of the commandments are significant and to a great deal responsible for the difficulties of Marx's construction.

Hence in the following it will be argued that Marx's above reasoning is not convincing. This does not mean that his analysis is entirely

wrong or useless. Not at all! The situation might rather be compared to Wittgenstein's ladder in the *Tractatus Logico-Philosophicus* (1922). Wittgenstein argued in proposition 6.54 that although his propositions will eventually turn out to be nonsensical, they can be used like steps on a ladder to arrive at a higher level of understanding. Once one has reached the higher level, one "must so to speak throw away the ladder". One "must transcend these propositions" in order to "see the world rightly". Something similar applies with regard to Marx's analysis. It was meticulously scrutinized by numerous scholars and served as steps on a ladder that allowed them to get above and beyond the level Marx had reached and leave behind the faulty parts of his analysis. Advancement in the sciences typically follows some such movement and there is no reason, why with regard to Marx things should be different. It goes without stressing that humans are fallible, and Marx was a human. To treat his analytical hypotheses and propositions as if they contained eternal truths, as it has often been done (and still is in some circles), reflects a fundamental misunderstanding of how science advances.

Before we proceed, a most important difference between Marx's concept of labour and that of the classical economists from Adam Smith to David Ricardo ought to be mentioned, which has hardly ever been noticed and assessed in its implications. The classical economists did not reserve the concept of labour exclusively to human labour, but treated it on a par with the labour performed by animals (horses, oxen) and machines. (Adam Smith even reckoned certain activities of nature amongst the total amount of labour performed in the economy.) Here is not the place to enter into a detailed discussion of this fact. It suffices to mention that to the classical economists what mattered was that the different kinds of labour are, as Ricardo stressed, in "constant competition" with one another and that in conditions of free competition cost-minimizing behaviour decides about their employment. Ricardo expressed the logic behind this perspective on labour in the third edition of the *Principles* in the following way:

> If I employed one hundred men on my farm, and if I found that the food bestowed on fifty of those men, could be diverted to the support of horses, and afford me a greater return of raw produce, after allowing for the interest of the capital which the purchase of the horses would absorb, it would

> be advantageous to me to substitute the horses for the men, and I should accordingly do so; but this would not be for the interest of the men (…) (*Works* I, p. 304).

The choice of technique of profit seeking producers determines the physical real costs of production —the means of subsistence, the fodder of horses, the fuel of machines and the complementary inputs used. It therefore co-determines the properties of the economic system, that is, has an impact on the general rate of profits and competitive prices.

Karl Marx did not share what we may call a *physical real cost-oriented* approach to the different kinds of labour and, in further consequence, to the theory of value and distribution. In fact, he was strictly opposed to it (for some evidence, see Section 7 below) and saw only human labour as the origin and even substance of value. This indicates a fundamental divide between the analyses of Smith and Ricardo, on the one hand, and that of Marx, on the other. And why the three authors shared several views, in this important respect they parted company with one another. Labour, it turns out, is my no means the simple thing for which some people are inclined to take it.

We now have a closer look at the starting point of Marx's construction: His critical discussion of the value relation in Aristotle.

4. MARX ON THE VALUE RELATION IN ARISTOTLE

Marx was very well read in Greek philosophy. His oeuvre abounds with references to the Greeks, especially Aristotle. In his PhD thesis he dealt with the difference between the Democritean and the Epicurean philosophy of nature; Aristotle is mentioned in the retrieved parts of the thesis a couple of times. He also did so in his Notebooks on Epicurean, Stoic and sceptical philosophy. In his *Grundrisse der politischen Oekonomie* (1966) he criticized a point of view, which in the eighteenth century swiftly attracted supporters: The ultra-individualistic doctrine of human nature and civil society, which attempted to develop social theory by starting from the isolated, needy individual —Robinson (Crusoe). Against this he put forward *inter alia* Aristotle's view who in *Politics* had insisted that man is by nature a political being, a *zoon politikon* (ζώον πολιτικόν) Aristotle's *Nicomachean Ethics* and *Politics* are prominently

mentioned in *Zur Kritik der politischen Ökonomie* (*A Contribution to the Critique of Political Economy*) and then in Marx's magnum opus, *Capital*, of which only volume I was published during Marx's lifetime. There he called Aristotle the "great thinker" and the "greatest thinker of antiquity" (Marx, 1954, pp. 64 and 384) and developed his labour value-based approach in terms of a critical discussion of Aristotle's thoughts on the problem of the value relation.

Marx credited Aristotle with having been "the first to analyse so many forms, whether of thought, society, or Nature, and amongst them also the form of value" (Marx, 1954, pp. 64-65). But he criticized him for not having seen that (abstract) labour is the "substance of value". Aristotle, Marx maintained with reference to the fifth book of the *Nicomachean Ethics*, rightly opined: "'Exchange,' he says, 'cannot take place without equality, and equality not without commensurability' (…). Here, however, he comes to a stop, and gives up the further analysis of the form of value. 'It is, however, in reality, impossible (…) that such unlike things can be commensurable' —*i.e.*, qualitatively equal. Such an equalisation can only be something foreign to their real nature, consequently only 'a makeshift for practical purposes'" (Marx, 1954, p. 65). What was the reason for Aristotle's sudden "stop"? According to Marx "it was the absence of any concept of value", a lack of understanding that "what is really equal" in different commodities is "human [!] labour" (*ibid.*). It had escaped the greatest thinker of antiquity what Marx considered to be a fact, namely, that the substance of value is human labour. Marx added that "to attribute value to commodities, is merely a mode of expressing all labour as equal human, and consequently as labour of equal quality". This Aristotle could not see, because "Greek society was founded upon slavery, and had, therefore, for its natural basis, the inequality of men and of their labour-powers". Marx went on:

> The secret of the expression of value, namely, that all kinds of labour are equal and equivalent, because, and so far as they are human [!] labour in general, cannot be deciphered, until the notion of human equality has already acquired the fixity of popular prejudice. This, however, is possible only in a society in which the great mass of the produce of labour takes the form of commodities, in which, consequently, the dominant relation between man and man, is that of owners of commodities.

Marx concluded: "The brilliancy of Aristotle's genius is shown by this alone, that he discovered, in the expression of the value of commodities, a relation of equality. The peculiar conditions of the society in which he lived, alone prevented him from discovering what, 'in truth,' was at the bottom of this equality" (Marx, 1954, pp. 65-66; emphases added).

Marx prided himself with having discovered what "is at the bottom of this equality". The brilliancy of Marx, we might say, paraphrasing "Old Moor", consisted precisely in establishing this truth. In this regard Marx benefited from the fact that at the time when he lived commodity production and exchange were well established and had "already acquired the stability of natural, self-understood forms of social life". In such conditions, "the labour-time socially necessary for [the production of various commodities] forcibly asserts itself like an *over-riding law of Nature*" (Marx, 1954, p. 80; emphasis added)[2].

These views, Marx was convinced, stood firm: On the basis of the law of value it was not only possible to ascertain the inner relations and law of motion of capitalism, it also provided the key to an understanding of past and future societies.

Alas, neither Aristotle's nor Marx's views can generally be sustained. This will be shown in terms of a very simple model of an economy, in which commodities are produced by means of commodities and in the first variant no social surplus is generated: Whatever is produced is just enough to reproduce the means of production used up in the course of production and the means of subsistence in support of the population. The latter may consist only of simple commodity producers who produce all products; in this case the means of sustenance go entirely to them and their families. If the population contains also a propertied class, such as landowners, the quantities of commodities consumed include also the consumption of this class. All products are traded as commodities via interdependent markets. The attention focuses on the conditions to be met in terms of exchange-values of commodities that allow for the reproduction of the economic system. The with-surplus case, in which the surplus

[2] According to Marx, "The religious world is but the reflex of the real world". He added: "Christianity with its *cultus* of abstract man (…) is the most fitting form of religion" (Marx, 1954, p. 83) in capitalism.

will be distributed at a uniform rate of profits on the capital invested in each line of production —the case of competitive capitalism— will then be briefly dealt with. Against the background of this model the basic message is that Aristotle was wrong in maintaining that there is no such thing as a common third, and Marx that it can only be abstract labour.

5. COMMODITY PRODUCTION: A CASE OF MULTIPLE COMMON THIRDS

The search for something that would render heterogeneous commodities commensurable bothered already the classical economists a great deal. As we have heard in Section 2 above, their surplus approach to value and distribution saw the key variable of the capitalist economy, the general rate of profits, as relating two vectors of heterogeneous commodities —the surplus product and social capital— to one another. This necessitated rendering these commodities commensurable. The classical authors were therefore on the lookout for an "ultimate measure of value": They were keen to reduce each and every commodity to the sought measure and then aggregate across bundles of commodities in terms of it. This would have allowed them to ascertain the magnitude of the rate of profits and other economic variables. The proposals put forward included William Petty's "bread" and Adam Smith's "corn": Bread or corn were needed directly or indirectly in the production of all commodities, because all production needs workers fed on bread and thus corn, and corn also enters directly into its own and several other products. Hence, all commodities could be reduced to the suggested ultimate measure of value and commodities could be conceived of as being exchanged in proportion to the amount of it contained in each of them[3].

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[3] A remark is appropriate regarding the talk about certain kinds of commodities or labour "embodied", "contained", "stored up" or "congealed" in a product. Obviously, if coal has to be burnt to generate heat needed to strike iron, it does not "enter" into iron *verbatim*: It is simply an indispensable input needed by the employed method of production that has to be destroyed in order to produce a sword or a shovel. The classical economists and Marx rightly spoke of the "productive consumption" of necessary inputs and did not imply that the input —whether labour or a material input— in fact entered the product. As especially William Petty and the Physiocrats knew well, in agriculture workers have to be fed and sheltered even in periods (*e.g.* winter time) when natural conditions prevent them from performing at all or performing in the usual way. (See Sraffa's respective observations in

Marx was well aware of the respective classical concern, as *The Theories of Surplus Value* document in some detail. However, in his writings he steadfastly rejected the view that a use value (or a *compositum mixtum* of use values) could be a common third: Atoms of use values could not possibly be the sought *tertium comparationis*. In several references to chemistry and physics, he stressed this point (see, *e.g.*, Marx, 1954, p. 87)[4]. It had to be labour, abstract human labour, and nothing else.

This view cannot be sustained: Any product that is needed directly or indirectly in the production of all commodities produced in the economy could serve as a common third. This can be shown in terms of Sraffa's early attempts in the late 1920s to come to grips with the classical economists' approach to the problem of value and distribution and their concern with an ultimate measure of value. In an economic system that is just capable of reproducing itself, all commodities that are being produced are needed either directly or indirectly in the production of all commodities —be it as means of production or as means of subsistence. Any one of them may therefore serve as a common third. Sraffa in his 1960 book called commodities that satisfy the given condition (with regard to the means of production) "basic products".

We can clarify the argument in terms of an example in which three commodities are produced by means of themselves. Obviously, in conditions in which no surplus product is generated above and beyond what is needed for reproducing the economic system, there is no need to refer to "quantities of labour" in an attempt to determine relative prices that meet the requirement of reproduction. The physical data concerning means of production needed and means of subsistence advanced to workers is all that is required to accomplish the task. The case of three products would give rise to the following equations of production:

D3/12/12, p. 8, composed in summer 1929.) These considerations throw doubt on the emphasis on human labour time spent in actually producing commodities and explain why the early authors were so much concerned with actual sustenance of workers ("food"), the physical real costs of employing them even across periods of their enforced idleness.

[4] In one place we read, for example, "So far no chemist has ever discovered exchange value either in a pearl or a diamond. The economic discoverers of this chemical element, who by-the-by lay special claim to critical acumen, find however that the use-value of objects belongs to them independently of their material properties, while their value, on the other hand, forms a part of them as objects" (Marx, 1954, p. 87).

$$\begin{aligned} A_a v_a + B_a v_b + C_a v_c &= A v_a \\ A_b v_a + B_b v_b + C_b v_c &= B v_b \\ A_c v_a + B_c v_b + C_c v_c &= C v_c \end{aligned} \qquad [1]$$

Here, the A_i, B_i and C_i ($i = a, b, c$) give the amounts of commodities a, b and c used in the production of the three commodities, comprising necessary means of production and means of subsistence, and A, B and C give the amounts of outputs of the three commodities; v_i gives the value, or price, of commodity i ($i = a, b, c$). In the case of an economy without a surplus or net product:

$$A = \sum A_i, B = \sum B_i, C = \sum C_i; \ (i = a,b,c)$$

In systems without a surplus, all commodities are basic products. Equations [1] are homogeneous linear equations only two of which are independent of each other. They have infinite sets of solutions, but the solutions are proportional to each other. Hence exchange ratios of commodities are fully determined. Fixing a standard of value implies setting the value of one of the commodities equal to unity. The values of the other two commodities are then expressed in terms of quantities of the standard. In late 1927 and early 1928, Sraffa, in an attempt to unravel the analytical core and genuine significance of the classical approach to the theory of value and distribution, began to discuss such systems of equations. Following in the footsteps of the classical economists, he saw swiftly that "reducing" the value of a commodity to the amount of some other commodity needed directly and indirectly in its production yielded the following result:

> For the first equations (without surplus) it is obviously true that the amount of *b* that a unit of *a* fetches in exchange is equal to the amount of *b* that directly or indirectly has been used up, in successive stages, in the production of a unit of *a*. The method would be that, if in 1*a* enter 3*b* + 2*c*, we would put aside the 3*b*; find that in 2*c* enter 1*b* + 2*d* (…), put aside the 1*b* and find how many *b* enter into 2*d*, etc. The series is infinite but the sum is finite[5].

[5] See Sraffa's Papers kept in Trinity College, Cambridge. According to the catalogue prepared

This method can be applied with regard to each and every commodity produced in the system. The exchange ratios of any two commodities can therefore be conceived as reflecting the relative amounts of any one of the commodities in the system used up in the production of one unit of the two commodities under consideration. This meets in a straightforward manner Marx's criterion. No ambiguity is involved as in the case of abstract labour and values are fully determined in physical terms.

Sraffa rightly pointed out that the method of reduction employed by the classical authors allows one to get only an approximate solution, because however far one carries the reduction, there will always be a commodity residue consisting of small fractions of every commodity. In order to get a full solution, one would have to solve the above system of simultaneous equations [1]. Neither the classical authors nor Marx were possessed of the mathematics needed to do so.

Seen from this perspective, the search for an ultimate measure of value or tertium comparationis was an attempt to deal with a highly intricate problem in terms of tools that were not fully up to the task. This reflects, Sraffa was convinced, a mismatch between a sophisticated conceptualization of the circular process of production in terms of interdependent industries and the primitive analytical instruments available at the time. With the benefit of hindsight we might say that classical political economy first fell into disrepute and then into oblivion essentially because of this mismatch.

Its inability to overcome the impasse was taken to demonstrate conclusively that it was barren and irrelevant and that its very foundation —the theory of value and distribution— was beyond remedy. As Sraffa (1960) showed, this involved a crass misunderstanding, because the classical approach could be given a logically coherent form that elaborated on the strengths and shed the weaknesses of its former formulations[6]. Sraffa's contribution might be said to represent the most advanced level that

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by Jonathan Smith, archivist, the above passage is to be found in file D3/12/7, pp. 30-31. [In accordance with the system of equations given above, we have replaced upper case letters used by Sraffa for commodities (*A*, *B*, *C*, *D*, …) with lower case ones (*a*, *b*, *c*, *d*, …)].

[6] Several elements of Sraffa's findings were anticipated by Russian authors or authors that had lived in Russia, including Vladimir K. Dmitriev, Ladislaus von Bortkiewicz and Georg von Charasoff. See Kurz and Salvadori (1995, chap. 13).

has been reached up until now with the help of the ladder constructed by the classical economists and Marx.

We may conclude this section by drawing the implications of the above for propositions by Aristotle and Marx. Aristotle was interested in the conditions that had to be met in order for the Greek economy to reproduce itself. Since the economy exhibited a social division of labour mediated via a system of interdependent markets, its reproduction presupposed a set of exchange values that could not be arbitrary, but had to meet well specified requirements. The Greek economy, I surmise, could be described in terms of a system like the one depicted by equations [1]. If this is accepted, then Aristotle was wrong in rejecting the idea that such unlike things as olives, wheat and muttons are commensurable. They clearly are, and each one of them can be reduced to a quantity of any of the other commodities following the reduction method sketched in the above. Alternatively, if we are interested in a fully determinate solution, we would have to solve a system of simultaneous equations.

As regards Marx, he was wrong in contending that the common third can never be an atom of use value. In fact, there is not only a single common third, there is also a common fourth, fifth and so on, depending on the overall number of basic products in the system. It goes without saying that also bundles of such products may serve the purpose. *Vis-à-vis* this finding one can say that searching for a common something was not chasing a will-o'-the-wisp. The problem is rather that there are too many of them in the given conditions —in the extreme a myriad[7].

We may now turn briefly to an economic system with a surplus. In this case, obviously:

$$A \geq \sum A_i, B \geq \sum B_i, C \geq \sum C_i;\ (i = a,b,c)$$

[7] The question is what is the substance under consideration, whether it is unique, whether it can be known independently of solving the equations of production, whether it remains the same when time goes by, and so on. As regards intertemporal and interspatial comparisons, there is no presumption that there is the same common substance "embodied" in commodities produced at different times and locations. The substance, if any, is rather bound to change with location and over time.

and at least one of the weak inequalities is actually a strong one. If the surplus is distributed in terms of a uniform rate of profits on the capital advanced in each line of production, we would have to reformulate the equations of production, introducing as a new variable this rate, r, and get:

$$(1 + r)(A_x v_a + B_x v_b + C_x v_c) = X v_x$$
$$(X = A, B, C; x = a, b, c)$$

These three equations are independent of each other and there are four unknowns: The three values or prices (v_x) and the rate of profits, r. Fixing a standard of value allows us to solve the system of production equations with respect to the remaining unknowns (see Sraffa, 1960, chap. II; Kurz and Salvadori, 1995, chap. 4).

The following remarks are in place. First, the rate of profits and prices of production are fully determined in terms of the system of production in use, which involves also a given real wage rate, hidden, so to speak, in the advances of commodities in the various industries. In order to arrive at this result there was no need to first ascertain the labour values of commodities and only thereafter the relevant price magnitudes. Prices and the rate of profits are determined *simultaneously*. When the problem of value and distribution is approached in this way, a way the classical economists had indicated, there simply is no problem of or need to "transform" labour values in prices of production. This problem was the result of a false starting point that led into a dead end and caused a lot of confusion. Secondly, the capital advanced in each industry and in the economy as a whole consists of heterogeneous commodities and can only be conceived of as a value magnitude: It can generally not be known independently of, and prior to, the solution of the system. Since much of Marx's argument referred to the ideal case of competitive capitalism, the right starting point of his investigation would have been a system as the one sketched here. The fact that the "quantity of capital" in the economy and in the different industries can only be known after prices have been ascertained, spells trouble for the marginalist theory of income distribution. This theory presupposes that the quantity of capital, whose relative scarcity is supposed to determine the rate of profits, can be known independently of prices and thus income distribution. Third, even in a system with a surplus there will typically be common thirds,

that is basic products, but, flukes aside, the relative quantities of them contained in the various commodities will not be equal to relative prices.

There is a fourth observation to be added, which leads us to the next section. Labour values can be shown to be special prices that obtain when the social surplus is distributed entirely to workers and there are no profits (and rents). Labour values, too, presuppose the solution of a system of simultaneous equations. However, in order to see this a few analytical steps have to be taken that concern the problem of how to render heterogeneous labours homogeneous. As we have heard in the above, while Marx's first commandment was: "Abstract from the heterogeneity of commodities!" his second commandment was: "Abstract from the heterogeneity of labours, assume 'abstract labour'!" The question is: How did he fulfil this commandment? Put differently: What is the meaning of abstract labour in Marx and is it a useful concept?

6. THE CONCEPT OF ABSTRACT LABOUR – A MEANINGFUL AND USEFUL CONCEPT?

Marx's oeuvre is made up of several layers stemming from different periods of his work and reflecting different influences and concerns. No wonder then that there are tensions and even contradictions between its different parts. This applies also to the concept of abstract labour or "human labour in general". Faccarello (1983; see also Faccarello, Gehrke, and Kurz 2016) has drawn the attention to the different and mutually incompatible definitions we find in Marx's writings. Here it suffices to confront two such definitions with one another, one which treats all kinds of labour alike, the other which follows the classical economists by using a given structure of wages to render heterogeneous labour homogeneous.

Marx famously stated: "The [human] labour (…) that forms the substance of value, is homogeneous human labour, expenditure of one uniform labour-power" and thus "a productive expenditure of human brains, nerves, and muscles" (Marx, 1954, pp. 46 and 51). The first part of this definition presupposes that labour has already been made homogeneous in one way or another, whereas the second part is apparently meant to reveal how this is brought about. Yet the reader is sent from one set of heterogeneous things (different kinds of labour) to another

set (human brains, nerves, muscles)[8]. Do the proportions in which these very different things are productively expended in various kinds of labour play no role? Does it make much sense to simply add up hours worked, irrespective of the kind of work performed, the skill level involved, the time it took to acquire it, the wages workers get and so on? How compares, for example, the productive expenditure of labour power of a bushman in the Namib desert and of a computer specialist in Silicon Valley, not to speak (following the classical authors) of the performance of artificially intelligent machines?

Aggregating across the labour times worked of all workers has widely been taken to express, in Marx's own words, "the notion of human equality [that] has already acquired the fixity of popular prejudice"[9].This gets some support from Marx's view that the kind of technical progress congenial to the capitalist mode of production tends to render skilled labour superfluous and reduce it to simple labour that can, in principle, be performed even by children. However, as has already been mentioned, there are other definitions of abstract labour in Marx, one of which reflects the classical economists' "reduction" of different kinds of labour to a single kind via relative wage rates. Adam Smith, for example, had proposed this conversion key in *The Wealth* (*e.g.* WN I.VI.3) and Ricardo had adopted it in *The Principles* (*Works* I, p. 20). The classical economists were also clear, for example, that in the case of skilled labour the distinction between labour and capital gets blurred. Smith for example, saw a strict analogy between an item of durable capital and skilled labour power and famously stressed that an educated man "may be compared to one of those expensive machines. The work which he learns to perform, it must be expected, over and above the usual wages of common labour, will replace to him the whole expence of his education, with at least the ordinary profits of an equally durable capital" (WN I.x.b.6). For a summary account of the classical position and how to deal with its various aspects analytically, see Kurz and Salvadori (1995, chap. 11).

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[8] The German original of the cited passage lists also "hand".

[9] It deserves to be mentioned that in today's measures of labour productivity the denominator still contains numbers of workers or hours of work performed. That is, like in Marx things are being added up without having first been rendered commensurable and thus comparable.

Interestingly, Marx in the same vein stressed, for example: "If the wage of a goldsmith is paid at a higher rate than that of a day labourer, (…) the former's surplus labour also produces a correspondingly greater surplus-value than does that of the latter" (Marx, 1959, p. 264). This reflects Marx's assumption that the rate of surplus value is uniform across all spheres of production, which implies that differences in wage rates do not thwart this uniformity. In order for this to hold true, the classical conversion of different kinds of labour via the structure of wages is required (see also Kurz and Salvadori, 2010). Do higher wages not reflect, at least to some extent, the cost of production of the particular quality of work under consideration and thus reflect what nowadays is called "human capital" —a concept long known to economists, as the above quote from Smith shows?

We may briefly summarize the classical concept in the no-surplus case. Assume that each one of the three commodities in Equations [1] is produced by a different kind of concrete labour and that each kind of labour is paid a different real wage per year. Assume that the real wage in the first industry is given by vector $\mathbf{w}_a$ and the corresponding number of workers employed in order to produce gross output A is given by L_a; the corresponding vectors and scalars with respect to the other two industries are $\mathbf{w}_b$ and L_b and $\mathbf{w}_c$ and L_c, respectively. How much do the three types of labour "contribute" to the values of the gross outputs of the three commodities?

Select the kind (or bundle) of labour(s) in terms of which you wish to express abstract labour. Assume that it is the labour of the industry that produced commodity c. Solve equations [1] for ν_a and ν_b, taking commodity c as standard of value ($\nu_c = 1$). Now calculate the values of real wages of heterogeneous labours in terms of this standard. This gives:

$$L_x(\mathbf{w}_{xa}\nu_a + \mathbf{x}_{xb}\nu_b + \mathbf{w}_{xc}); (x = a, b, c)$$

Then aggregate these quantities across all industries in order to get labour's net value added in the system as a whole in terms of commodity c. It follows that the quantities of abstract labour calculated are merely derivatives of the given physical data. They do not provide any new information that was not already available in these data. Therefore,

they cannot possibly provide a foundation, let alone an independent foundation, of value analysis (see also Steedman, 1977).

What matters in the theory of value and distribution, as the classical economists stressed, are actual real costs of production, which reflect *inter alia* the actually paid real wages. Therefore, if a theorist's aim is to determine the general rate of profits and prices of production, as Marx clearly did, he or she must take into account the wage structure. Flukes apart, starting from hours of labour and ignoring different and possibly vastly different wage rates cannot possibly lead to a correct determination of the sought magnitudes.

Not possessed of a fully correct theory of value and distribution, Ricardo used the labour value-based accounting as a makeshift solution, which, he was convinced, would give a result that approximated the correct result with sufficient accuracy. In terms of it he carried out *intertemporal* comparisons with regard to the same economy at different times and *interspatial* comparisons of different economies. Obviously, the use of the wage structure as the sought operator made sense only if in the first case that structure did not change much over time and if in the second case it was largely the same across different economies. If these conditions were not met or if some kinds of labour fell victim to technical progress and entirely new kinds entered the system of production, Ricardo's famous search for an "invariable measure of value" would recur in the form of a search for an invariable kind of labour. Clearly, if one compares one and the same economy at points in time that are far apart, or economies that are far apart from each other in space, it may turn out that they do not have in common any particular kind of labour, let alone the same set of labours. This would spell trouble for the labour-embodied approach to the problem of value, including, of course, Marx's approach, who followed the classical economists in this regard in some of his work.

Some of the above discussion was inspired by Piero Sraffa's thoughts on the related, but different problems of the classical economists' search for an ultimate measure of value and Marx's concept of a "common third" in his early and hitherto unpublished papers kept at Trinity College, Cambridge. It is therefore appropriate to draw the reader's attention to some of them.

7. SRAFFA ON THE COMMON THIRD AND THE LABOUR VALUE-BASED REASONING

In the spring of 1928 Sraffa contemplated upon Heraclitus' famous fragment, according to which "All things are exchanged for fire, and fire for all things, as goods for gold and gold for goods". Sraffa had apparently come across it when reading the French edition of volume I of *Capital* (see D3/12/10, p. 24). He insisted that all the confusion encountered in the literature regarding its interpretation vanishes if one substitutes "electricity" for fire. While he does not say so explicitly, Sraffa proposed this substitution in all probability because in modern times electricity is an input needed in the production of each and every commodity and therefore may be considered a common third or "substance"[10]. A few years later Sraffa's interpretation might be said to have received some support from the eminent German physicist Max Planck. In a book about modern physics, which Sraffa had in his library and had annotated, Planck wrote: "If we compare the old theory with the new, we find that the process of tracing back all qualitative distinctions to quantitative distinctions has been advanced very considerably". He added: "According to the modern view there are no more than two ultimate substances, namely positive and negative electricity" (Planck, 1931, p. 16).

Sraffa came back to the problem of a common substance of commodities in 1940 after he had read the English reprint of volume I of *Capital* in an internment camp of the Isle of Man to which he and other foreigners living in the United Kingdom were put. He asked: "What is the force of this argument?" and answered: "It appeals to some generally accepted principle, which should be stated explicitly. Something like this: If two things are equal in one respect, they must also be equal in some other respect". He drew the attention to the noteworthy fact that the general idea underlying this view was also advocated by marginalist theory, which rejected, however, Marx's specification of it and insisted instead that *marginal utility* was as the "common" thing.

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[10] This does not mean, of course, that in systems with a surplus commodities would exchange for one another according to the amount of electricity needed directly and indirectly in their production.

Yet some critics rejected the idea altogether, irrespective of which form it was given. These included Cassel (1925, especially pp. 62-67), who objected: "If two objects are of equal length, why should they have any other property in common, beside the same length?" While Sraffa agreed with Cassel that Marx had put the problem in an absurd way, it did not mean that it was without significance. Sraffa explained:

> Now if a measurement is made, and two things are found to be equal, it is said that they have the same length, or weight, or force, etc. This may be a mere restatement of the result of measurement in other words —which merely gives the illusion that there is a substance (length, force, etc.) which is behind the measurement. But it may be not. If the length, force, etc. can be also measured (and therefore defined) *in an independent way*, then the statement is a real one, not an illusion.
>
> Thus to say that two things exchange for one another "because they have the same exchange value" is tautological, *if exch. value cannot be measured in any other way than by seeing how they exchange. But if it can, the statement is a law* (Emphases added).

To this he added a list of "quantitative properties" including, for example, length, weight, force and temperature. Notice, that all properties mentioned are physical properties. Sraffa's reasoning shows that the kind of argument Marx put forward may be put in a way that is meaningful (and not tautological), but it does not support Marx's idea of the "substance of value".

This becomes also clear when especially in the late 1920s and at the beginning of the 1930s Sraffa commented on the labour value-based reasoning in the classical economists and Marx. He stressed, for example, that "the fatal error of Smith, Ricardo, Marx has been to regard 'labour' as a quantity, to be measured in hours or in kilowatts of human energy, and thus commensurate to value. (…) All trouble seems to have been caused by small initial errors, which have cumulated in deductions (*e.g.* food of worker = quantity of labour, is *nearly* true)" (D3/12/11, p. 36). In another document, composed in November 1927, he insisted: "It is the *whole* process of production that must be called 'human labour', and thus causes all product and all value. Marx and Ricardo used 'labour' in two different senses: The above, and that of *one* of the factors of production

('hours of labour' or 'quantity of labour' has a meaning only in the latter sense)". He added: "It is by confusing the two senses that they got mixed up and said that value is proportional to quantity of labour (in second sense) whereas they ought to have said that it is due to *human labour* (in first sense*: A non measurable quantity, or rather not a quantity at all*)" (D3/12/11, p. 64; emphases added).

In his copy of the eight volumes of the French edition of the *Theorien über den Mehrwert* (Marx, 1924-1925), which he read in the summer of 1927, Sraffa noted carefully all passages in which Marx distanced himself explicitly from approaches that proceed exclusively in terms of commodities or "use values". Marx took issue, for example, with Petty who had singled out food, not labour, as the measure of value. Sraffa placed a wrinkled line, expressing disagreement, in the margin of the passage in which Marx insisted that no physical input can be the immanent measure of value. And on the flyleaf of volume VI he stated: "Marx against physical costs 122".

As regards the main difference between the physical real costs approach, which Sraffa endorsed following in the footsteps of Petty and the Physiocrats, and the labour value-based approach, he clarified "that the first does, and the latter does not, include in them the natural resources that are used up in the course of production (such as coal, iron, exhaustion of land) —[Air, water, etc., are not used up: As there is an unlimited supply, no subtraction can be made from ∞]. This is fundamental because it does away with 'human energy' and such metaphysical things" (D3/12/42, p. 33).

This brings us back to the observations made in Section 3 above that the classical authors did not restrict the concept of labour to human labour only, but subsumed under the concept also the labour of animals and machines. Interestingly, not only Marx, but also Alfred Marshall in his highly influential textbook *Principles of Economics* (1977 [1890], p. 504) had argued that different principles apply to "free human beings", on the one hand, and machines, horses and slaves on the other. Sraffa in around mid 1928, while not denying that there were differences between the different kinds of labour, insisted that these did not matter as regards the determination of value. What mattered where physical real costs in employing workers, horses or machines. He added: "It is a

purely mystical conception that attributes to human labour *a special gift of determining value*" (D3/12/9, p. 89; emphasis added).

Incidentally, it deserves to be mentioned that his readings of historical, ethnological and anthropological works confirmed Sraffa's doubts that the law of value applied in a straightforward manner in primitive and developing economies.

In the concluding section we ask whether the problem of a common third can be said to resonate in Sraffa's constructive work, which culminated in the publication of *Production of Commodities by Means of Commodities* (1960). The obvious candidate to look at in this respect is Sraffa's concept of the Standard commodity.

8. THE STANDARD COMMODITY: A COMPOSITE COMMON THIRD

In his attempt to elaborate a coherent formulation of the classical surplus-based theory of value and distribution, Sraffa had to solve the following intricate problem: How did relative prices for a given system of production depend on income distribution, that is, the real wage rate (or the share of wages) and the corresponding rate of profits. While Smith, Ricardo and Marx were all clear that relative prices did not reflect only the technical conditions of production actually in place, but also the sharing out of the product between the different claimants —workers, capitalist and land owners— they failed to establish rigidly the mathematical properties of this relationship. Clearly, when distribution changes, relative prices typically also change, and so will the social capital employed, the magnitude of the social product and so on, given the standard of value. Ricardo had asked himself whether there was a commodity whose price would be invariant with regard to changes in income distribution, because with an increase (decrease) in wages and the corresponding decrease (increase) in the rate of profits, the contrary forces exerting an impact on the price would just compensate each other. If such a commodity existed and was chosen as the standard of value, then we would have an "invariable measure of value". If some other price would change relative to the standard, it would be clear that the cause of the change would reside in the conditions of production of the commodity under consideration and in not the standard.

Sraffa was clear that no single commodity could ever be expected to satisfy the condition mentioned. In the early 1940s he saw that a *compositum mixtum* of commodities could satisfy the condition. The perfect composite commodity would, however, have to be constructed: It would be the one "which consists of the same commodities (combined in the same proportions) as does the aggregate of its own means of production —in other words, such that both product and means of production are quantities of the self-same composite commodity" (Sraffa, 1960, p. 19). As is well known, the sought composite commodity would be obtained exclusively in terms of the industries of the economy that produce basic products. The system so constructed is the *Standard system*. Since "in any actual economic system there is embedded a miniature Standard system", the Standard system expresses salient features of the actual system, in particular the inverse relationship between the actual rate of profits, r, and the share of wages (Ω). With wages paid post factum, we have:

$$r = R(1 - \Omega)$$

where R is the maximum rate of profits compatible with hypothetically zero wages.

Basic products, we have learned in the above, could all serve as the common "things" of all commodities, because they enter directly or indirectly in the production of all products, basics and non-basics alike. The Standard commodity collects all basics in such proportions that the ratio of the net product to the means of production remains the same whatever variations occur in the distribution of the net product between wages and profits and whatever the associated changes in prices. This ratio is the Standard ratio and gives the maximum rate of profits, R.

9. CONCLUDING REMARKS

We may summarize the argument above in the following way. Marx's concept of the substance of value consisting of abstract labour cannot generally be sustained. He provided contradictory definitions, each of which is beset with serious difficulties. Prior to Marx the classical economists tried to cope with the problem of heterogeneous commodities and the need to render them commensurable and comparable in

terms of an ultimate measure of value. Marx's concept of abstract labour may be seen (also) as an attempt to provide an alternative answer to the answer given by the classical economists, who originally identified bread or corn as the ultimate measure. Their focus was on physical real costs incurred in production and therefore it does not come as a surprise that the measures they first suggested were commodities or use values. When at a later stage labour was taken to be the ultimate measure, this blurred the physical real cost origin of the concept. It also blurred the fact that the classical economists did not limit the concept of labour to human labour only, but subsumed under it also the work of horses or machines, for example. The values of commodities, they insisted, depend on the real costs of production, consisting of the means of production and means of subsistence (in support of humans, horses, etc.) productively employed and partly used up, or "destroyed", in the course of production. Marx broke fundamentally with this tradition by limiting the concept of labour to human labour only. Sraffa objected that it is a "purely mystical conception that attributes to human labour a special gift of determining value". He is to be credited with having elaborated a consistent formulation of the classical surplus-approach to the theory of value and distribution.

The search for a common third, or *tertium comparationis*, turned out not to have been completely futile. First, it led to an investigation of systems of production characterized by a circular flow of commodities and thus greatly increased our understanding of the mathematical properties of modern industrial systems. Secondly, it showed that a number of propositions entertained by conventional economic theory cannot generally be sustained. In particular, since the endowment of the economy of capital cannot be taken as given independently of relative prices and the rate of profits, the latter cannot be conceptualized as reflecting the marginal productivity of capital. The metaphor of Wittgenstein's ladder applies: Having reached a higher standpoint, theories that turned out to be "nonsensical" should be left behind. ◄

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