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On recent reformulations of the labour theory of value

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Abstract - Il paper esamina criticamente tre proposte di ridefinire la teoria del valore-lavoro, la New Interpretation di Duménil-Foley, l'approccio di Wolff-Callari-Roberts, e il Temporal Single System Approach, che hanno in comune che questa teoria perde il ruolo di strumento per determinare il tasso di profitto e diventa una pura reinterpretazione di prezzi indipendentemente determinati, che vengono 'visti' come consistenti di quantità di valore-lavoro redistribuite sulla base del postulato, che però in tal modo diventa indimostrato e arbitrario, che solo il lavoro crea valore. Questi approcci sono giudicati filologicamente erronei e sterili, e indifesi rispetto alla teoria neoclassica; essi appaiono dovuti a una incomprensione dei fondamenti del giudizio di Marx sull'origine dei profitti nello sfruttamento del lavoro, fondamenti più correttamente colti da P. Garegnani e chiariti qui con un esempio.

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1. This paper comes out of a collaboration with Pierangelo Garegnani, unfortunately interrupted by his illness and death. I was asked by him in August 2010 whether I would draft an additional Section to an earlier paper of his, "The labour theory of value in Marx and in the Marxist tradition"[1], which had remained unpublished after being presented at a Conference in Bielefeld in 1980. This addition was to show the continuing relevance of Garegnani's paper by applying its arguments to recent developments in Marxist value theory. I accepted because I agreed with Garegnani's paper and I already had a manuscript suitable for the task, a critical presentation of the recent reformulations of the labour theory of value due to the "New Interpretation" of Duménil-Foley, to Wolff-Callari-Roberts, and to the Temporal Single System approach. Garegnani agreed that a discussion of those reformulations could indeed be the content of the additional Section; we discussed several times my successive drafts between September 2010 and March 2011, and Garegnani's comments changed my manuscript considerably. Still, we did not reach an agreed final draft, so Garegnani's 1980 paper will have to be published without the additional Section, which accordingly I felt I could rewrite as an autonomous paper less constrained by space limitations. I present the paper under my sole name as I cannot be sure Garegnani would have agreed with all I argue in it, also because several of the points now in the paper we never discussed. Paragraphs 2 and 3 are introductive, they summarize Garegnani's views and try to clarify the connection between the labour theory of value and exploitation through a new example; paragraphs from 4 to 7 discuss the New Interpretation, paragraphs 8 and 9 discuss the other two approaches; an Appendix provides a simple formalization.

2. I briefly remember the central thesis of Garegnani's 1980 paper[2].

[1] An abridged English translation of his articles on Marx in Italian published in the Italian weekly *Rinascita* in 1978-1979 and then republished as Part II of Garegnani (1981).

[2] That is, of the works in Italian mentioned in footnote 1. The readers unable to read Italian may integrate my very brief summary with Garegnani (1984), and especially with Garegnani (1991), an article originally conceived as an Appendix to the 1980 paper.

Garegnani's central claim is that replacing Marx's imperfect determination of the rate of profit with Sraffa-type equations (or with Garegnani's integrated wage-sector approach, cf. Garegnani 1984) means only a strengthening of Marx's overall approach, because in Marx the labour theory of value was only the tool – inherited from Ricardo – that allowed him to determine the rate of profit (on the basis of the real wage, quantities produced, and methods of production taken as given for that purpose in the 'core' of the classical approach), surmounting the danger of circular reasoning due to the need to know relative prices to determine the rate of profit when relative prices in turn depend on the rate of profit. This danger is surmounted by Marx through the idea of a redistribution of surplus labour value among commodities so as to establish a uniform rate of profit. The idea of an invariance of total exchange value, or if you like the idea that exchange value is 'produced' by labour time and only redistributes itself in the formation of prices of production, is not an apriori dogma in Marx, but the result of the idea widespread at the time, for example very important in Ricardo as noted by Sraffa, of a *reciprocal compensation*, in the aggregate, of the deviations of relative prices from labour values required for a uniform rate of profit, deviations that will mean a rise in price for the commodities with a greater-than-average organic composition of capital, and a decrease in price for the other ones, while no deviation will be necessary for a commodity of average organic composition (note that the social product by definition has the average organic composition!), for which therefore – Marx concludes – the rate of profit can be determined while leaving its price relative to its means of production as the labour theory of value would determine it. The labour theory of value is therefore wrong as a theory of relative prices according to Marx, but when applied to the social product it allows the determination of the average rate of profit, which once determined also allows, Marx argues, the determination of the prices of production of individual commodities by applying that rate to the capital advanced in the production of the several commodities. It is because he believed in this indirect ultimate validity of the labour theory of value as the correct basis for the determination of prices, that Marx speaks of exchange value as congealed labour time, of people exchanging amounts of labour when they exchange commodities, of prices of production as inconsistent empty notions unless explained by recourse to labour values, etcetera. This means that the importance of labour values for Marx is only as the tool that allows him to prove that the data he implicitly starts from in order to determine the rate of profit, namely quantities produced, methods of

production, and real wage, do allow the determination of the rate of profit, and therefore the surplus approach *is* solid, and the 'vulgar economists' who try to argue for an independent contribution of capitalists behind profits are wrong. The subsequent Marxist tradition, however, suffered from lack of competences in economic theory, did not understand this strictly 'quantitative' role of the labour theory of value in Marx, and, unable to defend Marx on his true ground (a defence that would have been impossible anyway for many decades, given the defects of Marx's theory and the absence of the correct solution), accepted the tendency of the critics of Marx to attribute to the labour theory of value 'qualitative' sociological and ethical tasks that in fact it did not have in Marx. The analysis of 'fetishism', for example, denounces the tendency to mistake prices and incomes for natural qualities rather than recognizing them as the result of historically specific institutions, an argument (perfectly reformulable in 'Sraffian' terms) that takes in Marx the form of retracing labours embodied behind these prices and incomes only because this is how Marx thinks prices are ultimately determined. And Marx assumes in Vol I of *Capital* prices proportional to labour values only because, given his (already reached) determination of the rate of profit, that assumption implied no mistake for the issues discussed in that first volume, and was easier to follow for his readers being still the largely accepted theory of the period, as testified e.g. by John Stuart Mill.

3. The proof that labour is exploited, in particular, does not lie in the validity of a quantitative correspondence of surplus exchange value with surplus labour time; this is a misconception that derives from a mistaken acceptance of the argument that the inability to prove such a correspondence might mean that the capitalists contribute to production, that profits reflect their contribution, and that *this* is the reason why commodities do not exchange in proportion to labours embodied – the argument of the 'vulgar' economists and then of the marginalist critics of Marx, an argument still found by many hard to reject, for example by Claudio Napoleoni.

It seems worthwhile to pause on this author because he is among the most explicit supporters of the above argument and he states his views most clearly in a 1991 article in English, that Garegnani could not consider in 1980. In this article Napoleoni writes:

> ...surplus labour alone cannot in any way be taken to indicate the existence of exploitation. It becomes such an indicator, however, within a theory according to which the

> value of wage-goods is made up of the labour contained in them and of nothing else. ... let us suppose that the working day is eight hours long and that the wage-goods contain five hours work. Only within a labour theory of value can we say that the worker reconstitutes the value of his wages during the first five hours of his working day, leaving the other three hours at the disposal of the capitalist. Within a value theory of another kind, according to which the value of wage-goods is constituted both by the contribution of labour as well as by the deferment of consumption, we cannot say that the first five hours [re]constitute the value of the daily wage; nor, therefore, can we say that three hours are given free to the capitalist. If, then, exploitation is taken to coincide (as for Marx it implicitly does) with the division of the working day into two parts – labour 'necessary' to reconstitute the value of wages, and labour in excess of this 'necessary' amount – we must conclude that this idea of exploitation is not even conceivable without the labour theory of value. (Napoleoni 1991, p. 227-28)

Napoleoni concludes that "this construction ... collapses with the inevitable breakdown of the labour theory of value. The fact that the labour theory of value does not explain exchange value means that the concept of exploitation as 'work done for others' is not tenable" (*ibid.*, p. 229).

The implicit theoretical background to these statements is the marginalist/neoclassical one, where if value is not proportional to embodied wages it is because there are other factors contributing to production and for this reason earning a positive rental; Napoleoni makes the reference to marginalism clear with his mention of deferment of consumption. But what interests us here is the argument used to open up the door to the marginalist views. The argument is that if and only if the labour theory of value were capable of explaining exchange value, would it be impossible to admit other productive contributions besides that of labour as determinants of the amounts produced (and hence of the value produced), and therefore profits would be the result of surplus labour. To start to see the limits of this argument it suffices to think of an economy where the rate of profit is zero but there is differential land rent: in this economy the labour theory of value would hold, but the productive contribution of land would be undeniable, indeed without it (coupled of course with the institution of private property) there would be no surplus not appropriated by the workers. But a further example can make it even clearer that the proportionality or non-proportionality of prices and labour values, or the correctness or not of Marx's idea of a compensation of deviations and hence of his $r=S/(C+V)$ formula, by themselves tell us nothing on what determines the existence of a surplus product and therefore on the existence

or not of exploitation.

Imagine an isolated market economy where production is carried out by self-employed artisans and cooperatives, and the rate of profit is zero: prices of production are proportional to labours embodied. One day Gengis Khan's army invades this community, but instead of killing everybody Gengis Khan announces that he will be content with collecting a yearly monetary tax at a rate r=20% on the value of the capital employed in each productive activity, a tax he will then use to buy goods on the market. The community is obliged to accept, and prices of production come to include a 20% tax on the value of capital which has the same effect on relative prices, and on real wages, as a 20% rate of profit. Relative prices are no longer proportional to labours embodied, Marx's r=S/(C+V) does not work, but production is still performed by the same labourers, and the goods appropriated each year by Gengis Khan with the income deriving from the tax do not reflect any productive contribution of the oppressors. One would have little hesitation, it would seem, to say that Gengis Khan is exploiting this community. But if Gengis Khan had imposed the tax as a given percentage of *wages*, with the rate of profit remaining zero, then relative prices would have remained proportional to labours embodied, but exploitation would be still there. On the other hand, imagine that the 20% tax rate on the value of capital is imposed not by Gengis Khan but by unanimous popular vote because it is decided to use it to help for some years another community struck by an earthquake: in this case the surplus product would again be associated with an impossibility to explain prices with the labour theory of value, but few would call the surplus product the fruit of labour exploitation. All this shows that the proportionality or non-proportionality between exchange values and labours embodied reflects, not the absence or presence of other productive contributions besides that of labour, but only the specific way the mode of appropriation of the surplus product affects relative prices; the origin of the surplus remains to be ascertained.

The possibility to characterize the incomes other than the workers' incomes as the fruit of exploitation depends therefore on the answer to the question, what prevents the workers from appropriating the entire social product. Now, according to the surplus approach, as evidenced already by Smith much before Marx, the positivity of the rate of profit in capitalist economies has the same basic cause as the positivity of the tax in my Gengis Khan example: it reflects the capacity of the social group that appropriates the profits

to compress real wages below their potential maximum[3] uniquely by virtue of the social power given to them by the social institutions of capitalism. If one finds it reasonable to describe the income of the invaders in that example as the fruit of the exploitation of the labour of the local inhabitants, and if one finds the classical theory of wages convincing, then one must also describe profits in capitalist society as the fruit of the exploitation of wage labour[4]. This conclusion in no way depends on the validity of Marx's equation r=S/(C+V), it depends rather on the solidity of the entire classical approach, and this requires that the approach be able to arrive at a satisfactory determination of the rate of profit and normal relative prices on the basis of its characterization of the forces affecting wages, quantities produced, and production methods. This satisfactory determination appears possible, and it has come out that it does not need an exchange value of capital relative to profits known before the rate of profit is determined – the purpose for which labour values were used by Marx.

4. But the prevalence of the interpretative tradition Garegnani criticizes has caused the modern advances in the determination of rate of profit and relative prices – which do without the labour theory of value and confirm defects in Marx's determination of the rate of profit – to be perceived as causing a "crisis" of Marx's entire approach instead of the strengthening they actually entail. The need to surmount this presumed "crisis" has stimulated proposals to reformulate or reinterpret the labour theory of value, that represent a further removal from a correct understanding of Marx and actually a fall into sterile nominalism and vulnerability to neoclassical arguments.

This, I contend, is the effect of the redefinition of the labour theory of value in the "New Interpretation" of Duménil (1980, 1983-4) and Foley (1982, 2000), in the similar

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3 Or to oblige workers to work more hours (or more intensely) for the same real daily wage, thus again reducing the real wage per unit of effective amount of labour performed.

4 The main reason why the institutions of capitalism obfuscate this fact is that the capitalists are the owners of capital, differently from the case in the Gengis Khan example. But it suffices to think of slavery to realize that the fact, that the slave owner supplies slaves with food and tools, is no proof of a contribution of his to production: his property of food and tools is only the result of his capacity to appropriate the surplus in previous periods. The same holds for the property of capital, and the marginalist/neoclassical attempt to refute this picture by viewing profits as rewarding a productive contribution of variable saving decisions falls on the inability of the approach to arrive at a consistent formulation, as shown by the criticisms of its treatment of capital, cf. Petri (2004).

approach of Wolff, Roberts and Callari (1982), and in the Temporal Single System (TSS) approach exemplified by the contributions in Freeman and Carchedi (1996a). Beyond their differences all three approaches agree in seeing prices as representing quantities of labour, on the basis of the *postulate* that only labour produces exchange value and that the process of exchange redistributes labour value such that the labour values people exchange are proportional to prices. In the New Interpretation, for example, this redistribution happens because in exchange all commodities are made equivalent to amounts of money, and money represents labour value: "the important issue for Marx was the idea that money represents social labor time, and that one can therefore use a measure of the monetary expression of labor appropriately defined at the level of the aggregate system of commodity production to translate flows of money in real-world capitalist accounts into flows of labor-time and vice versa" (Foley 2000, pp. 20-21).

The novel thing about these proposals is that in all of them relative prices are determined *independently* of labour values: the labour theory of value no longer has any role at all in *explaining* prices and profits; it is to *already determined* (or even unexplained, simply observed) prices and profits that the *postulate* is appended that they are or 'express' quantities of labour time, and to this end opportune normalizations are chosen so as to obtain the desired equality between price and labour time aggregates; a change of the explanation of prices and profits would not alter this equality, which is obtained ex post. Prices are argued to 'represent' or 'express' quantities of labour value *by definition*, whichever the forces determining them. Foley admits it explicitly, by claiming that it is an *advantage* of the New Interpretation that it "is completely general, in that it is consistent with *any* theory of price formation" (2000, p. 23)[5]. In the New Interpretation this is obtained by postulating that the exchange value of the net product of a given period 'represents' or 'expresses' or 'is produced by' the direct or 'live' labour L employed in the economy in that period; this amount of direct labour is divided by the total monetary value X of the net product of that period, and the result is called the amount of labour 'represented by' or 'that expresses itself in' a unit of money; the monetary price of each good or aggregate of goods, however determined, is then argued to represent an amount of labour, the same fraction of L as that money value is a fraction of X. The labour time 'represented' by a good is then by definition

[5] The same could be claimed for the TSS approach as will be pointed out later.

its relative price (however determined) when the net product per unit of labour is chosen as numéraire. Then the thesis that

> The basic insight of the labor theory of value is its claim that value forms, money, commodities, and so on, are expressions of abstract social labor. Thus in any transaction involving value, what is changing hands is control over some part of total abstract social labor time (Foley 1982, p. 42)

allows one to conclude that the amount of labour 'expressed' by profits is unpaid labour time, because the "part of total abstract social labor time" over which the money wage allows the worker to have "control" is naturally conceived as the paid part of her labour time; profits, the part of the value of the net product not going to wages, must then 'express' unpaid labour time. Thus it is purely as a result of these definitions that it is claimed that "profit arises from unpaid labor time" (*ibid.*). And since prices are now in fact amounts of labour time[6], the normal rate of profit correctly determined, i.e. the one determined by

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[6] Note that the approach (like the other two to be discussed) requires a 'reduction' of heterogeneous labour to homogeneity, but on how this is to be effected the approach remains silent; differently from Marx (cf. the Appendix) it is *not* stipulated that the 'reduction' must be effected on the basis of given relative wages (reflecting the social and institutional determination of wages in the classical approach, that authorizes treating *relative* wages too as data when determining the rate of profit in the 'core' of the approach); the 'reduction' criterion is left open: in a revealing paper Duménil, Foley and Lévy (2009) after stating in open contradiction to Marx that "Wages are not necessarily proportional to the value productivity of workers" limit themselves to proposing how in the New Interpretation one should derive the rates of exploitation of different workers from *given* relative value productivities of heterogeneous labour, but on what determines these differences in value productivities they remain silent, saying only that in order to determine them "some additional assumption about relative rates of exploitation (which Marx often explicitly assumes to be equal) is required" (p. 560). Where the 'often' should not have appeared, and why Marx assumed equal rates of exploitation remains mysterious. Two elements explain this position. The first is that the New Interpretation gives no reason to prefer Marx's criterion to other ones; different criteria would result in a different L but this would only change the amount of labour 'expressed' by the net product and therefore by a unit of money. This indeterminacy (admitted by Foley, 2000, p. 21 and 23, and also present in Foley, 2011), that reveals an arbitrariness and hence emptiness of the labour values the approach determines, derives from the fact that the approach, having abandoned all price-determining role of labour values, does not need to define labour values so as to obtain that a labour theory of value correctly *determines* relative prices at least when the rate of profit is zero or the organic composition of capital is uniform, the cases – the starting point of the 'compensation of deviations' argument – when normal prices are necessarily proportional to embodied *wages*. With this, the second element clearly emerges: an imperfect grasp of the structure of the classical approach (Garegnani 1984, 1987) with its separate determination of real wages, and of the role of the labour theory of value in it, makes these theorists unable to grasp the analytical *necessity* behind the way the 'reduction' is performed in all surplus theorists from Smith to Marx. What seems to emerge is also an insufficient awareness of the fuzziness of the notion of 'quantity of labour' and of →

'Sraffian' price equations, satisfies Marx's $r=S/(C+V)$ formula[7]. But these purely definitional results add nothing to our understanding of what determines the existence or the magnitude of profits. The labour theory of value becomes nothing more than a choice of pink lenses for one's spectacles.

5. As a consequence, against the aims of the supporters of the approach this redefined labour theory of value does *not* give one the right to characterize profits as resulting from the exploitation of labour in any meaningful sense of this term, a right that – as made clear in paragraph 3 – can only result from the explanation of why wages are below their potential maximum. Since surplus labour time is defined so as to equal profits whatever the forces determining the latter, that equality is no proof that surplus labour reflects exploitation: no reason is given to reject the neoclassical thesis, that surplus labour time is only a way to describe the fact that not all net product goes to wages and therefore a shortening of the length of the working day would be possible if, with the same technical coefficients, the net product were reduced to include only the workers' consumption: a correct statement but no proof that labour is exploited, since – according to the neoclassical approach – profits repay the contribution to production of the capitalists' cumulated abstinence from consumption, a sacrifice without which the net product would be much less. In fact the symmetry of the factors labour and capital in the process determining income distribution according to the neoclassical approach entails that *if* the simple existence of surplus labour time implied exploitation of the labourers, *then* one would have an analogous right to speak of exploitation of the capitalists-savers, since one might analogously determine an 'unpaid' surplus amount of capital services, the excess over the amount necessary (with the same

the consequent difficulty of measuring it independently of the costs it causes, even for a given type of work. For example in the same time stretch a librarian paid by the hour can perform vastly different amounts of different work operations (e.g. hand out books to readers, compile catalogues, research information on the Internet) depending on the day and the hour, and there seems to be no evident criterion for summarizing his/her activities into a 'quantity of labour' per hour: the amount of labour is measured in terms of hours because its *cost* is fixed in terms of hours. Not by chance the correct equations determining prices of production do not need 'quantities of labour' nor the 'reduction', they only need real wage costs per unit of output.

[7] The same result can be shown to hold for the other two approaches to be discussed in this Section, independently of how heterogeneous labour is 'reduced' to homogeneity (cf. the Appendix at the end of the present paper), and it allows all three approaches to claim that the 'mistake' in Marx's formula r=S/(C+V) disappears, and the "crisis" is surmounted.

technical coefficients) to produce a net product consisting only of the goods appropriated as profits; the absurdity of considering both labour and capital as exploited would then reveal the lack of connection between the New Interpretation's definition of an 'unpaid' part of the contribution of a factor and the usual meaning of exploitation, or in other words, it would show that the way the New Interpretation concludes that profits arise from unpaid labour time or labour exploitation is the empty result of arbitrary name tags.

It might be objected that this neoclassical argument applies with equal force to the determination of 'unpaid labour' on the basis of Marx's definition of labours embodied, so there is no superior capacity of Marx's labour values to prove labour exploitation relative to the redefinition of labour values in the New Interpretation. What such an objection would miss – and with this we come to the central misunderstanding this paper wants to dispel – is that Marx's labour values were not intended to prove exploitation by themselves, but rather in so far as they allowed a *determination* of the rate of profit on the basis of a specific theory of the distribution of the product among social classes, and therefore in so far as they allowed a confirmation of the consistency of that specific theory. The real "basic insight of the labour theory of value" was that *once the real wage is determined, the rate of profit is determined as well*; labour values were the tool that allowed Marx to reach this result (in the imperfect way concretely possible at the time). To prove the surplus approach correct on this issue – against the tendency, in Marx's time, increasingly to distance economic analysis from the surplus approach and to find an independent cause for the magnitude of profits – was the real "important issue for Marx" because fundamental for the argument that a class-struggle explanation of wage determination was a sufficient basis for an explanation of *all* incomes, and thus – leaving no room for abstinence or the other vulgar-economy mystifications – for the conclusion that profits have an origin analogous to that of the revenue of feudal lords or of slave owners. It is the overall surplus approach adopted and developed by Marx, with its explanation of why wages are below their potential maximum, that allows one to view profits as the fruit of exploitation.

Recognizing this as the true role of the labour theory of value in Marx of course implies, first, that a progress and nothing else is achieved when better instruments are found to perform the same task and to confirm Marx's "basic insight" correctly understood; and second, that if these better instruments imply an abandonment of the labour theory of value, this does not in the least entail a rejection of the forces that according to Marx determine the

functioning of the economy – and it is these forces that constitute the specificity of Marx's analysis.

6. What does this specificity consist of? We can leave aside here the 'vulgar economy' theories of Marx's time, nowadays what is above all important is to grasp this specificity in contrast with the neoclassical approach. One must then distinguish the traditional versions of the marginalist/neoclassical approach – which considered as much as Smith, Ricardo or Marx the task of the theory of value to be to determine the normal prices resulting from the tendency toward a uniform rate of return on supply price –, from the contemporary versions of general equilibrium theory, which have abandoned the traditional method of normal positions, at least on the surface. Relative to the latter, Marx differs already because of his clear adherence to the method of normal positions, a method that a resumption of Marx's general approach requires fully to recuperate as the only method that appears capable of distinguishing accidental temporary influences, whose effects are indeterminable and finally secondary because transitory, from the dominant tendencies that allow prediction and explanation. As particularly evident in the case of the TSS approach (to be discussed later) there seems to be much confusion on this issue; and certainly it is no help toward the surmounting of the confusions that the function of the labour theory of value to help determine *normal* relative prices, evident already in Adam Smith's example of deer and beavers, should be totally obfuscated by its being reduced to something that "can be maintained in the face of all the anomalies that arise from particular pressures on particular prices in concrete exchanges" (Foley 1982 p. 38). But if one then restricts the search for Marx's specificity to a comparison with the marginalist/neoclassical attempts to determine normal prices, one will not find the distinguishing element of Marx's approach in the theory of value *narrowly defined*, that is, in the theory of how *relative prices* are determined once real wages are given, rather than in the analytical reasons for an explanation of what determines wages radically different from the neoclassical one. The subset of the equations of general equilibrium of Walras or of Wicksell, that imposes the equality of product prices and minimum average costs, and adds a condition of uniform rate of return on supply prices, generates prices of production once the real wage is taken as given: it is not here that Marx differs. No, *the difference lies in the forces considered to determine distribution*: the factor substitution mechanisms that in the neoclassical approach permit the derivation of

decreasing demand curves for factors are totally absent in Marx (which is all to Marx's advantage, since those curves are based on an indefensible treatment of capital[8]); the causes of the level of wages, and the consequences of its variations, are therefore necessarily totally different from the ones in the neoclassical approach; the advantage given to capitalists by the institutions of capitalist society, as well as the social and political mechanisms constituting a countervailing power of labour, are *indispensable* to the explanation of wages (rather than being, if at all, *impediments* to the free working of competitive markets that would be able autonomously to reach a definite income distribution, as in the neoclassical approach). This difference has implications for all other parts of economic theory, in particular it explains the neoclassical belief in Say's Law and in a spontaneous tendency of competitive markets toward the full employment of resources, and Marx's radically different view of persistent unemployment and periodic crises as the normal and indeed inevitable condition of capitalist economies. *It also has a direct implication for the theory of value*, because the different theory of distribution and of quantities produced implies a very different *meaning* of normal prices: these are not interpretable as indices of scarcity and therefore of the relative capacity of the productive factors to yield utility to consumers, they are only the exchange ratios needed so that all units of capital may share equally in the appropriation of the surplus; but this implication cannot be grasped without the previous understanding of the difference in the forces considered to determine income distribution.

7. I have not found a clear reference to this difference in the literature proposing the reformulated labour theory of value. It is perhaps useful on this issue to examine how one of the founders of the approach, Duncan Foley, contrasts Marx and neoclassical economics in *Understanding Capital* (1986). In this book Foley does *not* present the relationship between Marx's approach and neoclassical economic theory as one of incompatibility, that is, as such that if one approach is correct then the other one must be radically wrong. He presents the neoclassical explanation of profits (i.e. of interest) as consisting of the claim that "Because

[8] One implication is that the absence of decreasing factor demand curves in Smith, Ricardo or Marx, far from being a deficiency of their analyses, *prevented* them from 'shunting the car of economic science on to a wrong line', a reversal of Jevons's evaluation of Ricardo, which must be applied to the marginal or neoclassical approach instead.

people prefer to consume earlier rather than later, the price of a commodity today is higher than the price [today] of the same commodity [for delivery] tomorrow." (p. 47) The second part of the sentence is true whenever there is a positive rate of interest, so the important part of the sentence is the first one, which *explains* the positive profit (positive rate of interest) as due to the need for a premium on savings to compensate for the disutility of abstinence. The issue is, whether this explanation is acceptable: Foley does not say that it is not. On the contrary, he seems to say that it is not contradictory with the Marxian explanation. Indeed he continues:

> Thus, if one unit of labor exchanges for one unit of output today and one unit of output today exchanges for two units of output tomorrow because of time preference, the capitalist who buys one unit of labor, uses it in production, and as a result has two units of output (worth two units of labor) tomorrow will be no better off than the worker who simply consumes a unit of output today. Because the two units of output (which include the Marxian surplus value) exist in a different time period, they are viewed as the equivalent of one unit of output in the present.
>
> It is not clear that these two analyses are contradictory, although they give different interpretations of the same situation. The question is why there should be a discount of future goods and services against present ones. Neoclassical economic theory attributes this to the psychology of the agents, especially of the capitalists, in a context of full employment of all resources. Marxist theory argues that, on the contrary, there is no tendency for capitalist systems to employ all available resources and that the psychology of capitalists is determined by the possibility of appropriating surplus value, not the other way around. The root of this disagreement lies in the different theories of value adopted by the two schools and in the consequent different interpretations of equivalence among commodities. Neoclassical theory sees goods and services as equivalents from the subjective point of view of the consumer; Marx sees them as equivalents in the objective sense that they carry a certain part of the social labor time of the society. The same phenomenon (appropriation of surplus value) can be seen as the exchange of subjective equivalents and as objective exploitation. (1986 p. 47-48)

Thus the root of the difference between Marx and neoclassical economics lies, it is suggested, not in the theory of wages but in the theory *of value*, that is, of relative prices and hence of what it means that two commodities are "equivalent"; the "disagreement" between the two approaches is not presented as such that only one of the two approaches can be correct; no analytical motivation is given why one theory chooses to adopt "the subjective point of view of the consumer", while the other one chooses the "objective" point of view of

"seeing" commodities as "carrying a certain part of the social labor time of the society": both choices are apparently defensible and indeed, the first and last sentence of the second paragraph of the quotation suggest, they highlight different aspects of the same situation. The neoclassical explanation of positive profits with which the passage starts is *not* rejected as mistaken (remember that 'appropriation of surplus value' only means that capitalists get part of the net product, it says nothing on what causes this fact).

At least in the influential case of Foley, then, no clear indication emerges of analytical differences that permit to distinguish Marx from the neoclassical approach on the basis of a specifically Marxian theory, incompatible with the neoclassical approach, of what determines income distribution and hence prices[9]; it is rather the labour theory of value, that is, a *decision* to view commodities as "carrying a certain part of the social labor time of the society" and to consider an exchange as exchange of equivalents only if the exchanged things 'carry' or 'represent' the same amount of labour time, that is presented as distinguishing Marx[10]; the New Interpretation simply modifies the quantitative aspect of this decision so as to make it surmount the defects in Marx's quantitative connection of price magnitudes with labour time magnitudes. One understands better Foley's otherwise surprising claim, quoted earlier, that it is an advantage of the New Interpretation that "it is consistent with *any* theory of price formation": this means that the New Interpretation is irrefutable, therefore incapable of contributing to the understanding of the causes of economic phenomena, but – we now understand – that is not its purpose; it is consciously conceived to be only a choice of pink spectacles, because *this* is seen to be the nature of

[9] Without in the least pretending to have thoroughly examined the evolution of professor Foley's thought on this issue, still I wish to note that in his recent book *Adam's Fallacy* (2006), although advancing several criticisms against the neoclassical approach, he nevertheless concludes that "perhaps we had better keep both classical and neoclassical analyses in mind, with the idea of choosing the appropriate perspective for whatever particular problem we face" (p. 174), a statement which again denies a fundamental incompatibility between the neoclassical and the classical (and Marx's) analysis of the forces acting in the capitalist economy.

[10] Cf. also "A situation in which one person gives another something for which the giver receives no equivalent is commonly called exploitation. Because this is exactly the situation in capitalist production, Marx argues that, *from the point of view of the labor theory of value*, the source of surplus value lies in the exploitation of the laborer. If you do not accept the *postulate* that labor produces the whole value added, you will not see much basis for the claim that wage-labor is exploitative." (Foley 1986, p. 39, emphasis added) It is again a matter of *point of view* and of *postulates*, not of which explanation of income distribution is the correct one. One wonders how Foley would evaluate the Gengis Khan example presented here in paragraph 3.

Marx's adoption of the labour theory of value too.

And yet one important difference between the two approaches *is* indicated, that could have been taken as revealing a difference in the forces assumed to determine the functioning of the economy: the Marxian denial of the tendency to the full employment assumed by the neoclassical approach. But it is not explained why this full employment assumption appears in one approach and not in the other one (the wording also seems to suggest that if the economy were at full employment then the neoclassical explanation of what determines the rate of interest would be correct[11]). Apparently, to distinguish the two approaches it suffices to stop at the choice of different 'theories of value' presented as simply different angles of observation, a choice for which no substantive analytical reason is supplied.

The pink-spectacles nature of the redefined labour theory of value finds confirmation in how Foley defends a usefulness of the New Interpretation[12]:

> [the New Interpretation] opens the way to an interpretation of the substantive parts of Marx's theory (his discussion of relative surplus value, induced technical change in capitalism, and the long-term tendencies of capital accumulation, or his theory of the circuit of capital, for example) as testable empirical hypotheses that can be confronted with widely

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[11] It may be opportune here to remember that, against the view of neoclassical economic theory, the flexibility of capitalist production implies that with an opportune stimulus to aggregate demand it would be possible to reach the full employment of labour whatever the income distribution.

[12] Less worth discussing is the dogmatic way Duménil argues a usefulness of the New Interpretation. Differently from Foley, he claims that the postulate that value is produced by labour and labour alone reflects an objective reality, on the basis of two disconcerting statements: first, that when the product vector is given (with **Q** the vector of quantities produced and **P** the price vector), "If prices change, the wealth of society is distributed in a different pattern, but the aggregate quantity expresses a type of invariance ... If the system of prices is allowed to vary, bearing in mind that only the distribution of the product is being modified: $\mathbf{P}_1\mathbf{Q} = \mathbf{P}_2\mathbf{Q} = ... = \mathbf{P}_m\mathbf{Q}$. To proceed in this manner is to implicitly refer to a social substance that is conserved through variations of prices." (Duménil 1983-84 p. 430; he does not seem to see that he has simply chosen **Q** as numéraire.). Second, that since this "social substance" is increased by production, it must consist of labour, because "only human labour is productive ... a machine does not produce ... Land does not produce by itself either ... To maintain that land itself is productive is to reject the labor theory of value" (*ibid*. p. 432-33, a clear *petitio principii* that also neglects that Marx insisted that land *is* productive of use value, criticizing the confusion between production of use value and production of exchange value). Having then proposed the New Interpretation as the way to maintain that exchange value is produced by labour, when he comes to illustrating "the explanatory power of the labor theory of value" thus redefined he finds it in the fact that "It allows us to interpret the price system as a reallocation of social labor according to strictly defined rules consistent with the capitalist character of society. The act of pricing does not create the social substance, but merely distributes it." (*ibid*. p. 436). But this is no "explanatory power", it is only a reassertion of the initial postulates.

> available statistical data ... while the New Interpretation does not itself propose any operational hypotheses about the evolution of the monetary expression of labor time or the rate of exploitation, its definitional framework allows us to measure the evolution of the monetary expression of labor time or the rate of exploitation in real capitalist economies, and to link these magnitudes to other aspects of capital accumulation, such as the bias of technical change, or the class relations of particular societies. (2000 pp. 23 and 28).

What Foley proposes is to examine the evolution of the monetary value of the net product per unit of labour, and of the wage share: magnitudes defined without recourse to labour values, relative to which the contribution of the New Interpretation is purely terminological, as in fact he admits by writing that no specific suggestion emerges from the new labelling. The fact that the magnitudes considered in the New Interpretation, behind the arbitrary reinterpretation as quantities of labour time[13], are standard monetary magnitudes means that they have been amply utilized already[14], so it is unclear why one should expect to get anything new from ‘seeing’ them as quantities of labour value. And as an *interpretation* of Marx’s magnitudes the proposal suffers from the non-correspondence between the two sets of definitions and therefore between the causes affecting them[15], and from the total openness as to the possible causes. The danger is evident that one may feel faithful to Marx simply because of the relabelling while in fact being anti-Marx because of the acceptance of neoclassical theses on the forces and mechanisms present in a capitalist economy. A scientific attitude requires of course that one be open to the possibility that the neoclassical approach be broadly correct, but one should at least be clear on where this approach differs from Marx’s, the more so since the recent debates in capital theory would appear to show that the neoclassical approach is *not* correct (Petri 2004).

8. The approach of Wolff, Roberts and Callari (1982) argues that Marx’s thesis in

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[13] With the problem of the indeterminateness of the ‘quantity of labour’ pointed out in footnote 6.

[14] For example the net product per unit of labour is the numéraire used in most discussion of reverse capital deepening to measure how the value of capital per unit of labour changes with income distribution.

[15] For example, since relative prices enter the ratio of unpaid to paid labour as determined by the New Interpretation (that is, the ratio of the profit share to the wage share in the net product), a change in this ratio may be due to so many different causes (e.g. to a change in the composition of output) as to yield less information than a change in unpaid and paid labour time as determined by Marx.

volume III of *Capital* that prices of production are *redistributed* labour values means that the price of production of the inputs in an industry is actually a quantity of labour value; if we accept this, then the labour value of a product must be determined as the *price of production* of inputs plus the living labour added in the production process. Then the value of labour-power is, analogously, the price of production of the wage basket, not the labour embodied in it according to the usual definition of labours embodied. By then choosing the same invariance postulate in the passage from labour quantities to prices as in the New Interpretation, namely that the exchange value of the net product equals labour employment, they are able to show[[16]] that total value and total profits are the same in prices and in these re-defined labour values, and therefore Marx's formula $r=S/(C+V)$ is correct. Differently from Foley or Duménil, they claim that their argument reflects Marx's own 'project' and therefore is a more correct interpretation of Marx's formula. However, they must use Sraffa-type equations to determine the prices of production, and these equations were not available to Marx: in order to determine the rate of profit he needed to determine the numerator and denominator of the ratio $S/(C+V)$ *before* the rate of profit and prices of production. Therefore the traditional interpretation of Marx's procedure and of S and $C+V$ in Marx's equation, remembered in §2 above, is clearly the only one to make sense.

The three authors actually come very close to recognizing it, by arguing at one point that "Nowhere in his works did Marx carry this project, like some of his others, through to completion" (p. 568), thus admitting that their proposal is not exegetically faithful but rather reconstructs what, according to them, Marx *would have* arrived at if he had been able to "carry his project through to completion". Which would have required Marx to reach the equations of Sraffa or at least of Bortkiewicz, realizing therefore that the labour theory of value was unnecessary for the determination of the rate of profit and prices of production! Then would he still have wanted to see prices as redistributed quantities of labour value? In order to answer yes, the authors must postulate reasons, for viewing prices of production as redistributed labour values, *additional* to the determination of the rate of profit; these reasons are indicated later in the article as follows: "A Sraffian approach uses the concept of 'surplus' only in the restricted sense of a physical surplus product ... In contrast, Marx's focus on class relations as his object of discourse requires him constantly to link the

[16] For a simple exposition cf. the Appendix.

existence within capitalism of a physical surplus to the parallel necessity for there to be surplus *labor* which creates surplus *value*." (1982 p. 580). But that the existence of a surplus product implies the existence of surplus labour is obvious (at least if one leaves joint production aside), what is not clear is why, in order to make class relations clear, one should maintain the view of surplus exchange value as congealed surplus labour-time, after realizing that exchange values and surplus exchange value can be explained the moment the physical surplus and methods of production are given[[17]], without recourse to labour values. We find again the pink spectacles. But at least it is recognized that Marx was using labour values to try and determine the rate of profit and *normal* prices (prices of production). This point, obfuscated in the New Interpretation, is vehemently denied in the TSS approach.

9. The TSS approach argues not only that *market* prices too should be seen as redistributed labour values (this is already in the New Interpretation), but also that labour values depend on the *historically performed* labour, and that *this* is how Marx defined them in Vol. III of *Capital*. It is as if commodities were containers of amounts of a fluid produced by living labour; through valuation of the commodities against money (again viewed as representing labour time) this fluid gets redistributed among commodities so as to render the value (amount of labour) 'attached' to each commodity proportional to its market price; if the commodity is used as a means of production, the fluid 'human labour' thus attached to it is then transferred to the product. Hence, supposing production to happen in separate one-period cycles, it suffices that for period t–1 relative market prices be given and the price level be fixed so as to render the total price of the social product equal to the total labour

[17] Indeed a basic observation that appears to be eschewed by all the theorists I criticize in this paper is that, as noticed already by Dmitriev, prices and profits can be logically conceived to exist even in a science-fiction completely automated economy where machines (and possibly animals) reproduce themselves, and human labour is totally absent from production processes. This shows that the notion of normal relative price does not logically presuppose the appearance of quantities of human labour among its determinants, only outputs and physical inputs. Indeed the irrelevance of quantities of labour as anything but a cause of wage costs per unit of output is clear in the 'Sraffian' equations; this, as pointed out in footnote 6, also dissolves the problem of how to 'reduce' heterogeneous labour to homogeneity, showing the absence of basis for the idea that different labours 'produce' different amounts of a common fluid 'quantity of labour value'. True, changes of the rate of profit due to changes in the length of the working day without changes in the daily real wage are less clear in their cause if one does not make quantities of labour time appear in the equations, but it remains true that these quantities of labour time are only relevant for the determination of the rate of profit and of prices as causes of wage costs per unit of output.

embodied in it, and then the labour embodied (before the redistribution operated by market prices) in a commodity produced in period t can be determined as the sum of the living labour expended in its direct production, plus the *historical normalized market price* of the nonwage capital inputs. The sum of the pre-redistribution labour values of the commodities produced in period t is then redistributed among these commodities in proportion to their market prices, which come again to represent quantities of labour once they are normalized so that the total market price of the social product equals the total labour embodied in it.

Thus, although on the basis of a partly different reasoning, what is proposed is again a redefinition of relative labour values as coinciding with independently determined relative prices, with no concrete consequence for the explanation of economic phenomena; and again the approach, as an intepretation of what Marx meant, encounters the difficulty that how Marx could think of having solved the problem of determining the rate of profit becomes mysterious. Actually the claim of the approach to be a more correct interpretation of Marx is particularly surprising since it tries to deny Marx's acceptance of the method of normal positions, running against the difficulty that from an author as critical of others as Marx was one would expect very explicit and repeated statements stressing his rejection of that method: but there are no such statements, just the opposite. I do not insist on this issue as there already are several criticisms of the TSS interpretation of the textual evidence, e.g. Mongiovi (2002). I find it more useful to comment on the vigorous rejection by the TSS advocates of the treatment, in the standard prices-of-production equations, of each good as having the same price as an input and as an output, an assumption which they define 'simultaneist' and which in their opinion means to accept general equilibrium theory: "the formalization of Marx's theory of value which descends from Bortkiewicz is a dead end which has served primarily to assimilate Marx to General Competitive Equilibrium" (Freeman and Carchedi 1996b p. *xiii*). Behind such a view there appear to lie misunderstandings that it may be worthwile to point out however briefly.

Freeman interprets the 'Sraffian' equations as reflecting an assumption that "All prices are constant" and comments: "Swallow this and it transports you to a different place from the planet earth: a timeless wonderland in which life repeats endlessly and unchangingly; the world ... of General Equilibrium." (Freeman 1996b p. 19). The current dominance of the modern notions of general equilibrium which, owing to the impermanence of their data, can say something about the real economy only if the equilibrium is actually

established, has apparently rendered Freeman unable to grasp the distinction between market price and normal price: he seems to think that what economic theory determines must be what one directly observes, so if the equations treat the input price and the output price of a good as coinciding it means that those equations cannot apply to an economy where prices do not remain strictly constant. But from Smith onwards the traditional argument – only abandoned by the modern versions of general equilibrium theory – has been precisely that little can be said about the moment-by-moment market price because of the indefinite multitude of possible accidental and transitory influences affecting it, but economic theory can nonetheless say something about its *average* over sufficiently long periods by looking at the corresponding normal price around which the market price gravitates because of the tendency of rates of profit toward uniformity[18]; and in determining normal prices (prices of production) one assumes the same price for a good as input and output not because normal prices are actually perfectly constant but because the normal conditions determining them change slowly enough for the change to be neglected. Of course the same conception of normal prices as centers of gravitation can be found in traditional marginalist authors (*not*, however, in modern general equilibrium theory), but as pointed out above this does not at all mean a fundamental similarity between the theory of capitalism of those authors and the one of Marx and the classical authors more generally.

Freeman further argues that "the simultaneous equation formalism introduced by Bortkiewicz ... enshrines in mathematically pure form the dogmatic and false proposition of Jean-Baptiste Say that supply creates its own demand" (Freeman 1996b p. 3) – another misunderstanding. The tendency toward a uniform rate of profit does not imply Say's Law, it is compatible with any theory of the level of aggregate demand. As explained in Garegnani (1978), Say's Law was accepted by Ricardo but only because of a lack of analysis of whether savings will translate into investment; the surplus approach does not provide analytical elements supporting the validity of Say's Law. It is only in the marginal approach, with its factor substitution mechanisms that are argued to ensure the tendency toward equilibrium on all factor markets, that Say's Law acquires analytical support. But the

[18] Interestingly, another staunch advocate of the TSS approach in the course of an attempt to criticize the so-called Okishio theorem concedes that after a cost-reducing innovation, if sufficient time is allowed, "capital does eventually become revalued in practice at its new, lower reproduction cost ... Here Marx and Sraffians agree" (Kliman 1996 p. 122). Here it is implicitly admitted that Marx did adhere to the method of normal positions.

critique of neoclassical capital theory has undermined those factor substitution mechanisms and therefore the neoclassical justification of Say's Law. A more correct theory of aggregate investment no doubt must deny Say's Law and make room for an influence of accelerator-multiplier interactions, debt deflations, class struggle, and so on, thus admitting the possibility and indeed likelihood of instabilities and crises in full accord with Marx; but there is no contradiction between admitting on the one hand instabilities of the *aggregate* level of investment, and admitting on the other hand that the, perhaps wildly fluctuating, *amount* of total investment will have a *composition* that will tend to favour the sectors offering the better prospects of profit, and that this will tend to equalize the rates of profit. Attributing a central explanatory role to normal prices in no way denies instability and crises. There is therefore no contradiction between Marx's evident adherence to the method of normal positions, and his rejection of any spontaneous tendency of the capitalist economy toward full employment or smooth growth.

10. The acceptance of sterile redefinitions of the labour theory of value that reduce it to pink spectacles defenseless against the neoclassical arguments would be hardly understandable without a strong fear that something essential to Marx's characterization of capitalism would be lost if the thesis that exchange value is a substance produced by labour time were abandoned. This paper has tried to point out that this fear is unjustified and has its cause in an insufficient clarity as to the structure both of the surplus (and therefore of Marx's) approach, and of the rival marginal/neoclassical approach. The scholar who after Sraffa has done the most to clarify these structures and their differences is Pierangelo Garegnani. A better acquaintance with his writings will favour a more fruitful utilization of intellectual energies.

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APPENDIX

1. This Appendix presents more formally the attempts to reformulate the labour theory of value discussed in the paper.

Until the end of the 1970s it was universally accepted that the ‘labour value’ of an aggregate of commodities was quantitatively identical with the labour embodied in it, determined, in the case (to which I restrict myself) of circulating capital and no joint production (with $\mathbf{m}$ the row vector of labours embodied, $\mathbf{a_L}$ the row vector of direct labour coefficients, and $\mathbf{A}$ the matrix of the technical coefficients of produced means of production of the dominant methods, each column a different industry), by:

$$\mathbf{m} = \mathbf{a_L} + \mathbf{mA}.$$

Comparison with the correct equations of prices of production had shown that it is generally impossible to establish an equality between the labour value, and the value in prices of production (let us call it *production-price value*), for two non-proportional vectors of goods: for example if one normalizes prices so as to render the labour value of the social product equal to its production-price value, then the labour value of the physical profits (the subvector of non-wage goods in the net output vector) generally differs from their production-price value (and therefore the labour value of capital too differs from its production-price value). The hard-to-escape conclusion was, not only that in general the rate of profit determined as the ratio of the labour value of profits to the labour value of capital is not the correct one, but also that, if one argues that

> *a*) the exchange value of the social product is produced by (in the sense that it is proportional to) the labour embodied in it

then one cannot argue that

> *b*) the exchange value of profits is produced by (in the sense that it is proportional to) the surplus or unpaid labour.

This was feared to undermine the thesis that profits result from the exploitation of labour (cf. paragraph 2 of the main text), a powerful motive behind the proposals to reinterpret the labour theory of value discussed in the text.

The New Solution or New Interpretation does not require specific formalization since it consists of (i) choosing such a money unit that the monetary exchange value of the *net* product of the given period is numerically equal to the labour embodied in it, which (once heterogeneous labour has been ‘reduced’ to homogeneity according to some criterion, and apart from differences between actually employed labour and socially necessary labour) coincides with labour employment, and then (ii) claiming that in this way money magnitudes "express" labour time i.e. are actually amounts of labour value[19]. By assumption “money represents social labor time”, and labour values are now defined to be the numerical expression of relative prices when the net product vector per unit of labour is chosen as numéraire. The New Interpretation amounts simply to a choice of numéraire for already given relative prices, so we do not need to write down equations. The (labour) value of labour-power is defined as its relative price in terms of that numéraire; if labour is homogeneous, this definition of the value of labor-power identifies it numerically with the share of

[19] Here and in the remainder of this Appendix, ‘value’ without adjectives means labour value; ‘exchange value’ means relative price, ‘monetary value’ or ‘money value’ means exchange value in terms of money.

wages in the monetary value of the net product. Assuming no land rents, since prices now express labour time, profits express unpaid labour time, hence the rate of exploitation (ratio of paid to unpaid labour time) is defined as the ratio between share of profits and share of wages. Since labour values are identified with relative prices with the net product per unit of labour as numéraire, the uniform rate of profit determined as a ratio between labour values obviously coincides with the one determined on the basis of prices of production, thus the two equalities *a*) and *b*) mentioned above are satisfied; in fact, they are satisfied *whatever the prices*.

2. The approach of Wolff, Roberts and Callari (1982) argues that Marx's thesis in volume 3 of *Capital* that prices of production are *redistributed* labour values means that the price of production of the inputs in an industry is actually a quantity of labour value; then the labour value of a product must be determined as the *price of production* of inputs plus the living labour added in the production process, and the labour value of labour-power is the price of production of the wage basket. Formally, assume circulating capital, and let $\mathbf{z}$ be the average physical wage basket, a column vector. Wages are advanced. The price-of-production equations are, with $\mathbf{z}$ the subsistence basket:

[1] $\mathbf{p} = (1+r)(\mathbf{pA}+\mathbf{pza_L})$

Labour values $\boldsymbol{\lambda}$ are now defined differently from $\mathbf{m}$, and precisely as:

[2] $\boldsymbol{\lambda} = \mathbf{pA} + \mathbf{a_L}$

where $\mathbf{p}$ is determined by equation [1]. Let $\mathbf{x}$ be the vector of quantities produced. Then $\mathbf{a_L x}$ is labour employment L, and hence equals total labour value added. Subtracting from it the labour value of wages, one obtains profits in labour values. Hence the rate of profit determined via these redefined labour values is:

[3] $r = (\mathbf{a_L x}–\mathbf{pza_L x})/(\mathbf{pAx}+\mathbf{pza_L x})$.

Let us compare this with the prices-of-production determination of r:

[4] $r = (\mathbf{px}–\mathbf{pAx}–\mathbf{pza_L x})/(\mathbf{pAx}+\mathbf{pza_L x})$.

Only the numerators differ. But they become identical if one stipulates:

[5] $\mathbf{px}–\mathbf{pAx} = \mathbf{a_L x} = L$.

This equation sets the production-price value of the net product $\mathbf{y}=\mathbf{x}–\mathbf{Ax}$ equal to its labour value and hence to labour employment; it amounts to choosing as numéraire for the prices of production the physical net product vector per unit of labour, as in the New Interpretation. It follows that the total price of the social product equals its total labour value:

[6] $\mathbf{px} = \mathbf{pAx} + \mathbf{a_L x} = (\mathbf{pA}+\mathbf{a_L})\mathbf{x} = \boldsymbol{\lambda}\mathbf{x}$

Furthermore, since the value of labour-power is defined as $\mathbf{pz}$, total profits π are:

[7] $\pi = \mathbf{px}–\mathbf{pAx}–\mathbf{pza_L x} = \mathbf{a_L x} – \mathbf{pza_L x} = L$ – total labour value of necessary labour = surplus labour value.

In this way, total value and total profits are the same in prices and in these re-defined labour values. Both equalities a) and b) mentioned at the beginning of this Appendix are satisfied.

This would appear to be the New Interpretation applied to prices of production, plus the suggestion that the resulting labour values might reflect Marx's idea of prices of production as redistributed labour values more closely than Foley or Duménil perceived.

3. The Temporal Single System (TSS) approach can be seen as a radicalization of the approach of Wolff, Callari and Roberts, in that it argues that *market* prices too should be seen as redistributed labour values. Prices are *always*, by definition, redistributed labours embodied;

commodities are viewed as if containers of amounts of a fluid produced by living labour; this fluid gets (somewhat miraculously) redistributed among commodities so as to render the amount of labour contained in each commodity proportional to the sale price; if the commodity is used as means of production, the fluid 'human labour' thus contained in it is then transferred to the product. Hence, supposing production to happen in separate one-period cycles, once for the previous period t–1 the price level is normalized so as to render the total price of the product equal to the total labour embodied in it, the labour embodied (before the redistribution operated by market prices) in a commodity produced in period t is defined as the sum of the living labour expended in its direct production, plus the *historical market price* of the capital inputs, determined by past technology and distribution and market accidents; labours embodied before the redistribution operated by market prices are determined by:

[8] $\boldsymbol{\lambda}_t = \mathbf{p}_{t-1}\mathbf{A}+\mathbf{a}_L$

where $\mathbf{p}_{t-1}$ is given, resulting from a 'normalization' of the *given* relative prices at t–1 (a determination of the price level) such that the condition

[9] $\mathbf{p}_{t-1}\mathbf{x}_{t-1}=\boldsymbol{\lambda}_{t-1}\mathbf{x}_{t-1}$

is satisfied (where $\mathbf{x}_{t-1}$ is the given vector of quantities produced at t–1 and $\boldsymbol{\lambda}_{t-1}$ is again given), i.e. such that the total exchange value of the product at t–1 equals the total labour embodied in it[20].

Constant capital C and variable capital V in the entire economy are accordingly defined at (normalized) historical costs:

[10] $C_t=\mathbf{p}_{t-1}\mathbf{A}\mathbf{x}_t$, $V_t= \mathbf{p}_{t-1}\mathbf{z}\mathbf{a}_L\mathbf{x}_t$.

The price level is again normalized so as to make the total labour value of the social product equal to its market price:

[11] $\mathbf{p}_t\mathbf{x}_t = \boldsymbol{\lambda}_t\mathbf{x}_t = C_t+V_t+S_t$

and it is then argued that the total labour value $C_t+V_t+S_t$ gets redistributed by the process of exchange so that $\mathbf{p}_t$ becomes a vector of labours embodied.

In the above equation, the vector of *relative* market prices at time t is again among the *data*, and the equation only determines their absolute levels so as to render the exchange value of the total product equal to the labour embodied in it[21]. Surplus labour value S is the difference between living labour $L_t=\mathbf{a}_L\mathbf{x}_t$ and variable capital as defined by [10], hence, with π standing for profits, and dropping for simplicity the index t from the current quantities:

[12] $\pi = \mathbf{px}-\mathbf{p}_{t-1}\mathbf{Ax}-\mathbf{p}_{t-1}\mathbf{z}\mathbf{a}_L\mathbf{x} = \boldsymbol{\lambda}\mathbf{x}-\mathbf{p}_{t-1}\mathbf{Ax}-\mathbf{p}_{t-1}\mathbf{z}\mathbf{a}_L\mathbf{x} = (C+V+S)-C-V = S$.

Thus profits too are the same in prices and in labour values; again, equalities *a*) and *b*) are

[20] Let $\boldsymbol{\pi}_{t-1}$ be the vector of given money prices at t–1, and let $\mathbf{p}_{t-1}$ be defined as $\alpha\boldsymbol{\pi}_{t-1}$, with α a positive scalar. Then $\mathbf{p}_{t-1}\mathbf{x}_{t-1}=\boldsymbol{\lambda}_{t-1}\mathbf{x}_{t-1}$ determines $\mathbf{p}_{t-1}$ by determining α.

[21] Analogously, relative prices at t–1, as well as $\boldsymbol{\lambda}_{t-1}$, must be data in equation [9]; this shows that there is an infinite regress in this theory, because the determination of $\boldsymbol{\lambda}_{t-1}$ requires the knowledge not only of relative prices at t–2 but also of $\boldsymbol{\lambda}_{t-2}$, and so on. In other words, the assumed redistribution of labours embodied due to the exchange process renders *relative* labour values equal by assumption to relative prices, but the approach is unable to determine the *magnitudes* of the labours embodied to be thus redistributed (or, as a consequence, the magnitude of the final redistributed labour values) unless one assumes the magnitudes of the labour values of their inputs to be known, and these require in turn the knowledge of the magnitudes of previous labour values, ad infinitum. In conclusion, only *relative* labour values are determinable, because coinciding *by assumption* with independently determined relative market prices: truly a big gain of understanding!

both satisfied; and in fact, according to this approach, labours embodied get redistributed so as to become proportional to nominal market prices; hence market prices, once their level is normalized so as to satisfy equation [11], become quantities of labour embodied; at the moment of exchange, labours embodied are no longer $\boldsymbol{\lambda}_t$, they are $\mathbf{p}_t$.

This approach too adds nothing to our understanding of the forces at work in a market economy, because it takes both input prices and output prices as given; indeed, it tells us even less than the previous approach because the given prices are *market* prices.

4. It has been pointed out in the main text that it is unclear what roles these redefined labour values are to have in a better comprehension of the functioning of capitalism; in none of the three approaches the determination of these 'labour values' contributes anything toward *explaining* prices or the rate of profit in the sense of clarifying the forces and mechanisms that determine them. The redefinition of paid (or necessary) and unpaid (or surplus) labour time appears to have no use except to salvage by arbitrary redefinition Marx's determination of the rate of profit as a ratio between labour values. Paid or necessary labour as traditionally defined has a practical content since it would become visible if the two subsystems producing wage goods, and profit goods, were geographically separated; paid labour as redefined by these approaches loses this meaning.

Let us come now to the question, in Marx's terminology, how 'complex' labour is to be 'reduced' to 'simple' labour. The absence of any criticism against Ricardo on this issue would suffice to show that Marx follows Ricardo in 'reducing' on the basis of relative wages. One can add the explicit statements by Marx to the effect that the labour time of better paid labour produces *proportionally* more value, so that the rate of exploitation of differently paid workers is the same (cf. Steedman, 1985, p. 564). Note that the implied uniform rate of surplus value or uniform 'rate of exploitation' in this analytical sense does *not* mean that all categories of workers are equally badly treated by capitalists (equally 'exploited' in a common language sense); in order to determine the rate of profit through the labour theory of value in the way summarized in paragraph 2 of the main text the reduction had to be proportional to relative wages even if, owing e.g. to trade unions, in different industries exactly the same work was paid different wages, or even if a category of workers was able to earn a high wage solely because of a capitalist strategy of creating a labour aristocracy in order to divide and weaken the labour movement.

But in the three approaches studied in this paper prices are determined before labour 'values' and independently of them, so one loses the classical analytical criterion for determining the relative 'value'-creating capacities of different labours. Thus relative 'value'-creating capacites remain undetermined[22]; one might determine them arbitrarily (a racist might even deny any value-creating capacity to a certain race) and one would still obtain the aggregate results of the approaches and the validity of *a)* and *b)*, because those results are imposed *ex post* by the normalizations adopted.

Let me show this for the approach of Wolff, Roberts and Callari. Let there be two types of labour 'α' and 'β' with respective physical column wage vectors $\mathbf{z}_\alpha$ and $\mathbf{z}_\beta$ and row vectors of technical coefficients $\mathbf{a}_{L\alpha}$ and $\mathbf{a}_{L\beta}$. Equation [1] becomes

[13] $\mathbf{p} = (1+r)(\mathbf{pA}+\mathbf{pz}_\alpha\mathbf{a}_{L\alpha}+ \mathbf{pz}_\beta\mathbf{a}_{L\beta})$.

Assume that the amount of value created by a unit of type 'α' labour, respectively by a unit of type 'β' labour, is respectively α and β. Then equation [2] determining labour values before their

[22] Cf. footnote 6.

redistribution becomes

[14] $\boldsymbol{\lambda} = \mathbf{pA} + \alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta}$.

Now 'labour value added', or the labour value of the net product, is $(\alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x}$. Subtracting from it the labour value of wages $(\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x}$, one obtains profits in labour values. Hence the rate of profit determined via labour values is:

[15] $r = ((\alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x} - (\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x}) / (\mathbf{pAx} + (\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x})$.

Let us compare this with the prices-of-production determination of r:

[16] $r = (\mathbf{px} - \mathbf{pAx} - (\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x}) / (\mathbf{pAx} + (\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x})$.

Again only the numerators differ. But they become identical if one stipulates the equality between price-of-production value of the net product and its labour value:

[17] $\mathbf{px} - \mathbf{pAx} = (\alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x}$.

Then the total production price of the social product equals its total labour value:

[18] $\mathbf{px} = \mathbf{pAx} + (\alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x} = (\mathbf{pA} + \alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x} = \boldsymbol{\lambda}\mathbf{x}$

and profits equal surplus value, given by total labour value added $(\alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x}$ minus the labour value of wages i.e. their production price $(\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x}$:

[19] $\pi = \mathbf{px} - \mathbf{pAx} - (\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x} = (\alpha\mathbf{a}_{L\alpha} + \beta\mathbf{a}_{L\beta})\mathbf{x} - (\mathbf{pz}_\alpha\mathbf{a}_{L\alpha} + \mathbf{pz}_\beta\mathbf{a}_{L\beta})\mathbf{x}$.

Thus the correct rate of profit and the validity of *a)* and *b)* are obtained for any magnitudes of α and β: one is free to fix them arbitrarily. But the absence of compelling criteria for determining the 'value'-creating capacities of different labour times would appear to radically question the notion itself of such a 'value substance' creation process.