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# The Labour Theory of Value, Simple Commodity Production and the Transformation Problem

Bill Jefferies

*This article revaluates contemporary criticism of Marx's value theory. Key tenets of Marx's value theory are widely rejected. The use of labour (abstract or otherwise) as a standard of value is deemed 'mystical' or 'magical'. The logical-historical method is false. The notion of simple commodity production a mistake. The solution to the transformation of values into prices of production mathematically incorrect. The theory of surplus value is superfluous. Okshio's theorem refutes Marx's law of the tendency of the rate of profit to fall. This article shows that the assumptions necessary to sustain this critique amount to a rejection of human production in general and capitalist production in particular.*

*Keywords: Value Theory; Transformation Problem; Historical Logical Method; Simple Commodity Production; Okishio Theorem; The Falling Rate of Profit*

## Introduction

The key tenets of Marx's political economy are widely rejected. Defences of Marx are increasingly insular, searching through the MEGA to find answers previously unnoticed in some forgotten letter or fragment of text.[1] This article takes a different tack. It discusses the historical and logical reasoning underpinning Marx's political economy. It shows that the various criticisms of Marx contradict the essential purpose of human production in general, and capitalist human production in particular. It reasserts the validity of Marx's logical-historical method and shows that this provides the key to answering why value must be socially necessary labour, why the transformation problem is a real event and why Okishio's theorem produces the opposite result to that Marx anticipated.

[1] Marcel van der Linden, Gerald Hubmann, eds., *Marx's Capital; An Unfinishable Project*? (Historical Materialism Book Series Volume 159 Leiden/Boston: Brill. 2018).

## Why the labour theory of value

Marx's historic-logical method reflects the actual historical emergence of categories in a modified form. It is attributed to Engels,[2] particularly his review of the *Contribution of the Critique of Political Economy*[3] (Arthur 2005). The conceit is that Marx sat back and relaxed while Engels revised the essential nature of his theoretical method. The problem is in the introduction to the Grundrisse,[4] and elsewhere, Marx elaborated the same method

> The economists of the seventeenth century, e.g. always begin with the living whole, with population, nation, state, several states, etc.; but they always conclude by discovering through analysis a small number of determinant, abstract, general relations such as division of labour, money, value, etc. As soon as these individual moments had been more or less firmly established and abstracted, there began the economic systems, which ascended from the simple relations, such as labour, division of labour, need, exchange value, to the level of the state, exchange between nations and the world market. The latter is obviously the scientifically correct method.

Classical economists begin with living whole and as they abstract from reality, so the development of their abstractions, or categories, necessarily follows a modified form of the actual historical development itself. They cannot invent their categories before they existed. Rubin[5] explained

> What makes an account of the history of economic thought particularly difficult is this two-sided nature of our task: the necessity to impart to the reader at one and the same time an exposition of both the *historical* conditions out of which the different economic doctrines arose and developed, and their *theoretical meaning*, i.e. of the internal logical relationship of ideas.

Chris Arthur counterposes what he calls systematic dialectics, the final system of categories, to the method of developing those categories, so severing the abstractions from their material base. This is practically the opposite of Marx's method. Arthur[6] claims that

> it should be remembered that Marx does not succeed in *Capital* chapter one in *demonstrating* the labour theory of value. He simply stipulates that value relations pertain to exchange of products of labour, and that other exchangeable things have price but not value.

Arthur considers that 'the value form in labour cannot be correct as far as the pure form of exchange is concerned because many non-products are coherently inscribed

2 Christopher Arthur, *The New Dialectic and Marx's Capital* (Leiden/Boston: Brill, 2004).

3 Arthur, The Myth of 'Simple Commodity Production', op. cit.

4 Karl Marx, *Grundrisse; Foundations of the Critique of Political Economy* (Rough Draft); transl. Martin Nicolaus (London: Penguin Books & New Left Review. 1973 [1857–61]) p. 33.

5 Isaac Ilych Rubin, *A History of Economic Thought*, transl. Donald Filtzer (London: Ink Links, 1979 [1929]), p. 10.

6 Arthur, op. cit., p. 156/7.

within the form'. In asserting that labour is the source of value in a capitalist economy, Marx was merely repeating a point originally elaborated by David Ricardo in the opening pages of the *Principles of Political Economy and Taxation*. Ricardo[7] considered 'labour to be the foundation of all value'. This included both relative and absolute value or price as relative values or prices can only be measured if there is an absolute standard, i.e. unit of measure. In 1815 Ricardo had developed a physical price theory based on corn, but under the influence of Thomas Malthus, by 1817 he had abandoned it. Malthus[8] observed 'in no case of production, is the produce of exactly the same nature as the capital advanced. Consequently, we can never properly refer to a material rate of produce'. In the *Principles* Ricardo noted that although a commodity must be useful or have a use-value (why else would someone buy it?) but use value is not the source of exchangeable value or price, which derives from two sources 'scarcity' (Arthur's non-products) or from 'the quantity of labour required to obtain them'. Scarce commodities cannot be reproduced and only form a 'small part' of the mass of commodities daily exchanged. Products, on the other hand, may 'be multiplied … almost without any assignable limit.' Therefore, when Ricardo speaks

> of commodities, of their exchangeable value, and of the laws which regulate their relative prices, we mean always such commodities only as can be increased in quantity by the exertion of human industry, and on the production of which competition operates without restraint.[9]

Arthur's non-products maybe bought, but are not subject to the law of value, which is exclusively limited to products. Non-products, or scarce commodities, which have a price but not a value, are not the subject of political economy. After all a mode of production is concerned with production or products, it combines the forces and relations of production to form the economic basis of society. It does not combine the non-forces with the non-relations of non-production.

Heinz Kurtz claims that Marx retarded, limited and hindered the development of political economy through his 'insistence on the "law of value", and his claim that labour was the only source of value'.[10] Ajit Sinha[11] makes the same point and repeats Piero Sraffa's question 'why labour? What are its magical or mystical virtues? Why not coal, or labour of horses, or any other quantity? Isn't the choice of labour purely arbitrary?' Sraffa's problem is that products (the products of human productive activity) are physically different to the inputs that made them.

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7 David Ricardo, *On the Principles of Political Economy and Taxation*, 3rd edition (Cambridge: Cambridge University Press, 1951 [1817]) p. 15.

8 Piero Sraffa, 1951. 'Introduction' to Ricardo's Work, Malthus letter dated August 5, 1814 in Sraffa 1951: xxxi–xxxii.

9 Ricardo, op. cit., p. 9.

10 Heinz Kurz, 'Marx after the mega Edition: A Comment', in: Marcel van der Linden, Gerald Hubmann (eds) *Marx's Capital; An Unfinishable Project?* (Historical Materialism Book Series Volume 159 Leiden/ Boston: Brill, 2018), p. 84–85.

11 Ajit Sinha, *A Revolution in Economic theory* (London: Palgrave McMillan, 2016), p. 200/201.

As they are different, so they are incommensurate. If they are incommensurate, then they cannot be counted. If they cannot be counted, then they cannot act as a standard of value. Commensurability requires that all commodities must contain some quantity of the same thing as exchange, takes place voluntarily between two people, and so must be objective not subjective. Exchange measures this quantity, how much private property changes hands. As only humans can own private property, so only humans can exchange private property, which is unique to humans. Sraffa's physical price system, the most widely developed physical price theory, which is advocated by all the opponents of the physical price theorists, replaces human labour with 'basic commodities' defined as those commodities from which all other commodities are produced. Sraffa's standard system, or 'Hypothesis', is limited to these basic commodities as 'all its outputs must show up as inputs as well'. Indeed the 'average industry produces a set of commodities in the same proportion as it uses them as inputs'. Nothing, therefore, happens in Sraffa's average industry, and so it is not an industry at all. Inputs and outputs, or the basic commodities (which show up as both inputs and outputs) are unchanged, qualitatively and relatively, in their mutual proportions with respect of each other. Sraffa explained that, as nothing changes in his system of equations, 'we can multiply both sides of the equation by an arbitrary number, leaving all the results unaffected: and we can multiply by different numbers different equations'.[12]

The assumption that inputs and outputs are unchanged, is a necessary consequence of the use of an equilibrium predicated on comparative statics. The equilibrium in Sraffa's model is a snapshot of a given moment. As a snapshot, so it cannot include change, which implies time. As it excludes change so it contradicts the premise of all production, which requires that outputs are physically different to inputs. This is what production is. While the assumption that relative prices are fixed contradicts capitalist production, which constantly revolutionises relative prices, in its quest to reduce costs. This is what capitalism is. As Sraffa's respective prices cannot change, in effect all the different basic commodities are the same, as the relative prices of two different commodities must necessarily change. Hence Sraffa's model is a one commodity in which inputs are qualitatively and quantitatively identical to outputs and where all relative prices are fixed. And this is progress in political economy?

If inputs and outputs differ, as they must in any actual production process, and relative prices fluctuate, as they must in any capitalist production process, then Sraffa's system is untrue. Sinha concedes that if Sraffa's key equation is not actually true then his system would be 'meaningless'.[13] The Standard Commodity 'provides a unit of measure that is unaffected by variations in wages and profits'. All that is necessary is to show that this hypothesis is not merely imaginary. And provided inputs and outputs are unchanged, that all commodities always remain in the

[12] Piero Sraffa in Ajit Sinha, *A Revolution in Economic theory* (London: Palgrave McMillan, 2016), p. 127.
[13] Sinha, op. cit., p. 138/139.

same fixed proportions relative to each other, then the '"Hypothesis" is true for the real system as well'. As the system is meaningless if untrue, let us assume it is meaningful and the world is untrue?

But this is not the only problem. Human labour is common to all human production, but no other commodity is. Coal, iron, corn or horses are not common to all human production and so are not basic commodities by Sraffa's own definition. Production is a process undertaken by animals, in which they materially alter their environment in some way. Animals, including humans, produce a more useful output that is different from the less useful inputs that produced it. A honey-bee transforming pollen into honey or ants transforming leaves into mould or a chimp harvesting termites with a stick or a horse manuring a field or humans building the pyramids or a self-acting mule or a 5G network. Human production is a subset of animal production undertaken by humans, but no other animal produces a 5G network. Smith and Ricardo considered physical alternatives as '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'.[14] But of course, not all peoples grow corn or make bread, so what then is the value of their production? Is it serious to assert that the value of production can be measured by how many of slices of toast someone had for breakfast? Kurtz says that 'any product that is needed directly or indirectly in the production of all commodities produced in the economy could serve as a common third', but what is the product? Human production is different from all other animal production as it is a conscious endeavour undertaken by humans. Hence, the only thing common to all human production is human labour, the measure of conscious human productive activity. This is so trivially self-evident that Marx may not have felt the need to labour the point.

Humans have another magical (or indeed mystical) ability, unlike any other animals, humans may own property. The value of horse labour is not the labour of the horse, but the labour of the person who made the horse labour. Property is a relationship between humans which gives one human the exclusive right to dispose of something (or someone) in any way they see fit, to the exclusion of other humans. As humans may own something, so they may sell the ownership of something or exchange it with another human for something else that they wish to own. Humans, unlike other animals (including horses) may buy and sell commodities. Sraffa should have known this; his father was a lawyer. As production is a process which physically transforms inputs, so outputs are incommensurate with or different to, or physically immeasurable by, the inputs destroyed in producing them. The assertion that there can be some other basic commodity, corn, iron, coal or something else, to human labour, forgets that production is a model of human production. Property, of which all value is a form, is a relationship between people. The purpose of production, the process that it is, is one of physical

[14] Kurz, Marx and the "Law of Value", op. cit., p. 54/55.

change. The assumption of physical constants, goods that remain the same as inputs and outputs (the necessary premise for the physical alternative to the labour theory of value) is only possible in the absence of production. Accordingly, as Elena Louisa Lange, (who demonstrates that Arthur's systematic dialectic not only contradicts the laws of political economy, but Hegel's dialectic too) explains the labour theory of value 'by *methodological necessity* runs like a golden thread through *Capital* from beginning to end'.[15]

## Simple commodity production and the circuit C–M-C

Arthur rejects the historical logical method as 'linear logic' and considers that the notion of simple commodity circulation or production, that treats the circuit C–M-C as a non-capitalist one, is mistaken. Arthur claims that 'the orthodox tradition, from Engels, through Sweezy, through Meek, to Mandel, understood these chapters (in *Capital I*) not to be about capitalism but to be about a putative mode of production termed by them "simple commodity production"'.[16] Arthur notes that Marx never used the term 'simple commodity production', to describe the circuit C–M-C, which was Engels' invention. Marx used the term simple commodity circulation. Rubin used the term simple commodity economy. Engels' term is superior insofar as it emphasises production rather than circulation and does not define C–M-C as an economy or mode of production. Whatever category is used it refers to non-capitalist circuit C–M-C[17]

> The circuit C–M-C starts with one commodity, and finishes with another, which falls out of circulation and into consumption. Consumption, the satisfaction of wants, in one word, use-value, is its end and aim.

The reason for discussing the circuit C–M-C is that it is from the simple exchange of commodities that the capitalist circuit M–C-M' originated

> The simple circulation of commodities - selling in order to buy - is a means of carrying out a purpose unconnected with circulation, namely, the appropriation of use-values, the satisfaction of wants. The circulation of money as capital is, on the contrary, an end in itself, for the expansion of value takes place only within this constantly renewed movement. The circulation of capital has therefore no limits.

Arthur considers that Marx assumes the entirety of the developed capitalist mode of production from the outset of *Capital*[18] 'Marx's presentation is not that of a sequence of models of more and more complex objects, but that of a progressive development of the forms of the same object'. This is a basic category error. The commodity in its

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15 Elena Lange, 'The Critique of Political Economy and The New Dialectic. Hegel, Marx, and Christopher J. Arthur's Homology Thesis', *Crisis and Critique*, 3:3 (2016), p. 244.

16 Arthur, op. cit., p.18.

17 Marx, *Capital a Critique of Political Economy Volume I*, op. cit., p. 106/107.

18 Arthur, op. cit., p.18.

simplest form is not capital, it is not the same object (or strictly speaking relation of production) but in the process of historical development becomes so. As Rubin notes, Marx observed that 'a simple category (for example value) can exist historically before the concrete category (for example, production price). But in this case the simple category still has a rudimentary, embryonic character which reflects relations of "undeveloped concreteness."' Thus, Marx continued 'although the simple category may have existed historically before the more concrete one, it can attain its complete internal and external development only in complex forms of society'.[19] The circuit C–M-C is the same, however it is labelled, and it is not a mode of production.[20] Rather it regulates the exchange of commodities, before the mode of production based on capital, or generalised commodity production or exchange or the circuit M–C-M' exists.

Arthur considers that 'according to Marx' the law of value is based on exchange according to socially necessary labour times, but within 'simple commodity production there is no mechanism that would *force* a given producer to meet such a target or be driven out of business'. Certainly, which is why the circuit C–M-C is not a capitalist one. Small producers, farmers and small handicrafts people, exchange their surplus, in the form of one set of use values, for money before buying another set of use values, with the money they have acquired from sale. If that exchange is unequal, there is no mechanism to make them go bust, because this is not a capital relationship, they will simply receive more or less use values than they anticipated. Arthur complains that when all inputs are subordinate to valorisation, i.e. exchange within the circuit M–C-M' 'then an objective comparison of rates of return on capital is possible and competition between capitals allows for the enforcement of the law of value' .[21] Neatly illustrating his lack of historical sense. The circuit C–M-C is not a capitalist relationship, it has no returns and there is no capital. Arthur observes that in the circuit C–M-C 'there are constraints, consequent on limit conditions, to such exchanges, there is no possibility of precise determination of the ratios of exchange concerned'. The limit conditions, how much the producer produces, the physical quantity of their surplus, the nature and type of goods they make, their distance from a market, etc. and so on are not capitalist ones. Simple commodity exchange was not capitalist production, but developed into it, as commodity exchange developed. Arthur prefers Kantian antimonies, Pure Reason and the unknowable thing in itself, being and nothing, value or no value, so his method is precisely undialectical, as Hegel sagely noted between being and nothing is becoming. It deals in fixed absolutes, counterposing the finished form of the category to its origin, change and development. Arthur's confusion stems from his assertion that as Capital is about capitalism, then all relations described in it must

[19] Rubin, *Essays on Marx's Theory of Value*, op. cit., p. 255.
[20] David Laibman, 'Modes of Production and Theories of Transition', *Science & Society*, 48:3 (Fall, 1984), pp. 257–294.
[21] Arthur, op. cit., p. 20.

be capitalist. The circuit C–M-C is not a form of the capitalist mode of production and is not subordinate to capitalist laws. As Marx notes[22]

> The exchange of commodities at their values, or approximately at their values, thus requires a *much lower stage* than their exchange at their prices of production, which requires a definite level of capitalist development … This applies to conditions *in which the labourer owns his own means of production*, and this is the condition of the land-owning working farmer and the craftsman, in the ancient as well as in the modern world.

Simple commodity production develops within earlier non-capitalist modes of production, capitalism after all exists, so it had to originate somewhere. Arthur claims that Isaac Illych Rubin refuted Engels in his *Essays on Marx's Theory of Value.*[23] Rubin did indeed criticise Engels' development of the law of value in the sense of the determinant of relative prices, before the existence of capitalism. Although Rubin noted that 'we will not be concerned with the historical controversy over whether commodities were exchanged in proportion to the labour expended on their production before the emergence of capitalism'. Rubin's book was published in 1928 as a collection of Essays produced during at the end of the Soviet New Economic Policy (NEP). It is part of the polemic of Rubin's group the 'Idealists' or value theorists, against the 'Mechanists' or physical price theorists lead by Alexander Bogdanov and supported by Gosplan. Rubin wanted to emphasise that value or abstract labour was a social relation of capitalism. Not least as the Soviet Union in the mid-1920s was a form of market economy undergoing precisely the kind of transformation pre-figured by Engels in his term simply commodity production. Rubin opposed the Mechanist notion that value was an ahistorical transcendental category operative throughout time and every human society. The differences between Rubin and Engels are exaggerated however, Rubin points out that 'Marx says that "it is quite appropriate to regard the values of commodities as not only theoretically but also historically *prius* to the price of production"'. Rubin notes that before the transition from the realm of labour to the realm of capital[24] the market was undeveloped, there was no general equalisation of different units of labour and that this trade only applied to surpluses. Engels makes these very points in the 1895 article, reprinted as an addendum to *Capital III*, itself.

The paradox that Engels referred to is that although it is only it is only with the emergence of capitalism that the law of value operates unhindered by non-capitalist barriers, the emergence of capitalism is coterminous with the transformation of values into prices of production. At the moment the law of value becomes universal products are no longer exchanged in proportion to the labour expended on their production. The labour theory of value may be understood in two senses, in the first as a

[22] Marx, *Capital Volume III a Critique of Political Economy*, op. cit.

[23] Rubin, op. cit., p. 254.

[24] Pavel Maksakovsky, T*he Capitalist Cycle; An Essay on the Marxist Theory of the Cycle*, transl. Richard Day (Historical Materialism Book Series, Volume: 4, London: Brill, 2004).

law which functioned only weakly, partially and unevenly as a subsidiary law within earlier non-capitalist modes of production, where labour times expended more or less directly determine relative prices. This is the sense it is understood by Sraffa who wrote[25]

> The Irony of it is, that if the '*Labour Theory of Value*' applied exactly throughout, *then, and only then, would the 'marginal product of capital'* theory work! It would require that all products had the same org.[anic] comp.[osition] … Then, commodities would *always* be exchanged at their Values; and their relative Values would not change, even when productivity of labour increased.

This is not the sense in which it is understood by Marx. Values equal relative prices (more or less) in the transition to capitalism but not after it. The growth of fixed capital creates capitals of different organic compositions, such that competition now redistributes surplus value to equalise profit rates. Once the transition to capitalism is complete the law of value has a different sense. Now it means the universal controlling law of the production, within which, coincidentally, the relative price of outputs practically never exchanges according to the amount of labour time required for their production.

## The transition to capitalism as the resolution of the transformation problem

Von Bortkiewitz showed that if you took the output prices of in Marx's transformation example as in the input prices for the next round of production, then given the assumptions of simple reproduction, production is disproportionate. Mathematically there were a different number of questions from unknowns, so it was impossible to maintain the identity with values and prices and surplus value and profits, during the transformation from values into prices of production. If considered separately from the world, then this disproportion contradicts the requirement of mathematical perfection deemed necessary by the standard of Pure Reason.

According to Van der Linden and Huberman[26] there are 'six' standard solutions to disproportionality in Marx's transformation procedure discovered by von Bortkiewitz. Puzzlingly all the solutions appear to accept the correctness of von Bortkiewitz's elision of mathematical truth with logical truth or Pure Reason. None of these are solutions to the transformation problem ultimately solve it, as they seek to work around the problem rather than explain it. Whatever the intentions of the authors, the effect is to undermine the coherence of Marx's argument.

Marx's theory is a materialist one, although even Hegel[27] considered that

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[25] Kurz, op. cit., p. 89.

[26] van der Linden and Hubmann, op. cit., p. 9.

[27] G.W.F. Hegel, *Being Part One of the Encyclopaedia of The Philosophical Sciences* (William Wallace Transl, with a Foreword by Andy Blunden Second edition published by the Marxists Internet Archive, 2013 [ 1830] p.112)

> The highest and final aim of philosophic science is to bring about … .a reconciliation of self-conscious reason with the reason which *is* in the word – in other words, with actuality.

The categories described in Marx's political economy are derived from history, real human society. Those categories are logical if they are actual. The test of Marx's logic is not its consistency with the world of Pure Reason, but with the actual real world. If reality is disproportionate, then the transformation procedure must necessarily be so too. A mathematically perfect transformation, while satisfying, according to pure logic, would be wrong, at odds with the real development of categories in history, if actual historical development was disproportionate. The logical historical method when applied to the transformation shows that the transition from values to prices of production was a discontinuous crisis wracked event.

In the Grundrisse[28] Marx notes that investment in fixed capital, the industrial revolution, disrupts the necessary proportions of production, as competition redistributes surplus value according to the quantity of capital advanced, not the quantity of value produced in the sector.

Competition redistributes surplus value to equalise profits, severing the link between values and relative prices. Such that the transition from values to prices of production means that

> *general overproduction* would take place, not because relatively too *little* [*sic*] had been produced of the commodities consumed by the workers or too little [*sic*] of those consumed by the capitalists, but because too much *of both* had been produced – not too much for *consumption*, but too much to retain *the correct relation between consumption and realization; too much for realization*.

The law of value, in the sense of a law that determines relative prices by labour times, no longer exists, even as the law of value, in the sense of a law as the controlling mechanism of the mode of production, only now exists. This disjuncture provides the actual solution to the transformation of values into prices of production, which was not merely logical, but historical too. The transformation of production through the growth of the division of labour described by Smith culminated in what Rubin[29] called 'manufactory'

> Industrial capitalism could begin its victorious progress only after the factory, with its extensive application of machinery and steam engines, had supplanted the manual labour of the – *manufactory*.

Rubin identifies the actual year that the completion of this transition took place at 'the beginning of the industrial revolution is usually set at 1769'. This was the actual historical transformation of values into prices of production, it was a real event that marked the creation of the actual capitalist mode of production itself. As Rubin noted

28 Marx, op. cit., p. 368/369.
29 Rubin, op. cit., pp. 221–228.

> The colossal rise in the nation's production did not reduce the poverty of its masses in the least Machinery which was intended to save on human labour frequently gave a further push to the *deterioration* in the labourers' working conditions Introduced at a feverish pace, it displaced hand spinners, weavers and other workers, who were threatened with either death by starvation or an existence as paupers.

Rubin continued 'the machine meant the utter ruin of hand spinners and weavers, put an end to the cottage industries'. The broad 'mass of workers suffered not simply from expensive corn, but also from the introduction of machinery, unemployment, and low wages.' Marx's historical-logical method unlocks the solution to the transformation of values into prices of production. The solution to the transformation problem it transpires, is that the actual transformation of values into prices of production was disproportionate. The problem is resolved, not solved, as the discontinuity was correctly anticipated by the mathematical discontinuity in Marx's model.

**Physical surplus or social surplus?**

According to van der Linden and Huberman 'the relationship between exploitation and value theory was regularly questioned' by 'Oskar Lange in the 1930s' who believed exploitation could be deduced 'without the help of the labour theory of value" and subsequently by Hodgson and Cohen[30] and many others. In a capitalist economy profit is the difference between price and cost, in the circuit M–C-M^', M^'-M=π where M' is sales, M is costs and π is profit. Profit is necessarily objective as a sale must be between two different people, but must profit be a form of surplus labour?

Ajit Sinha identifies three conceptions of surplus, subjective, quantum and objective from the Sraffian perspective. The Marshallian or Keynesian view is subjective. Surplus is defined by the subject's point of view. It changes according to the point of view of the observer (perhaps like changing views in a mirror, if I look from one side, the surplus around my girth is rather large, if I look from another, not so much). The individual feels they have a surplus and so they have. What has this to do with political economy? In a capitalist economy surplus is objective, it is the difference between prices and costs. Sinha[31] claims that this subjective view 'conforms with the position of quantum physics that there is no particular state of reality prior to its observation or measurement' (Sinha 2016: 84). In physics the uncertainty or Heisenberg principle notes that the velocity and position of a quantum object cannot be measured exactly, at the same instant, even in theory. As the act of measurement, at the quantum level, alters the object being measured. This is hardly true of economic surplus, which can be measured very precisely, it is the difference between costs and sales.

[30] van der Linden and Hubmann, op. cit., p.17.
[31] Sinha, op. cit., pp. 84–87.

The notion that the subject creates the world they live in through their perception of it means that there is no objective reality, no world existing outside of, or separate too, the subject. This is the subjective idealism of Kant or Wittgenstein, Sraffa's confrere. It means that, as the world has no prior or objective existence separate from perception, the subject creates the world by knowing it. As the only being that can create the world is God, then the subject is God. Maybe Sraffa is God, but this seems unlikely given that he was unable to explain surplus.

Sinha points out from a 'purely objective or deterministic scientific point of view, which removes the subject from the picture, the surplus must also disappear'. As Sraffa puts it 'if one attempts to take an entirely objective point of view, the very conception of surplus melts away'. If the price of output is determined by the amount of inputs destroyed in producing it, then as surplus is the difference between price and cost there can be no surplus. Hence the very conception of surplus melts away. Unable to convincingly explain what surplus is, Sinha postulates that the explanation of a surplus may lie outside 'the economic field'. Given that the purpose of economics according to Sraffa was to analyse surplus, the reader wonders what field this is? Sinha observes that Sraffa remained 'committed to the quantum physics point of view of indeterminacy'. Unsurprisingly perhaps, as what is indeterminate about Sraffa's theory is his missing explanation of surplus.

Sraffa, Siha, Hodgson, Cohen, Roemer, and the rest, merely repeated variants of Dmitriev's mathematical explanation of surplus. This was Dmitriev's paradox.[32] It was the original mathematical refutation of value theory. Dmitriev said that if an output can be produced without equivalent, then surplus can be explained directly without any theory of value. If a thing can make more of itself from itself, then surplus can be produced without human labour and so human labour cannot be the source of all surplus. Dmitriev's most famous example takes a number, say four robots, which, he claims, can produce a fifth robot without themselves changing. If this is possible then the fifth robot divided by the four existing robot gives a rate of profit of 25 per cent. But of course, the robot has not only been produced without human labour, it has been produced without any inputs at all. The robot has been produced out of nothing, as the original robots are unchanged. As something cannot be produced out of nothing, so the robot is nothing, as the robot is identical to the original robots, so they are nothing.

Kliman attempted to answer Dmitriev by postulating that if the machine was free, then there would be zero price and a zero rate of profit of zero.[33] Sinha in a criticism of Kliman notes that in a one good economy it is deemed prices are always equal to one, and that any other assumption contradicts the 'basic tenets' of logic. What logic? A one good economy is not an economy, or more strictly a model of an economy, insofar as it models production must consist of two goods, an input and a different

[32] Andrew Kliman, 'Simultaneous Valuation vs. the Exploitation Theory of Profit', *Capital & Class* 25:1 (2001) pp. 97–112.

[33] Kliman, *Reclaiming Marx's "Capital"*, op. cit.

product. According to Sraffa the price of a commodity is the amount of inputs destroyed in its production, yet no inputs were destroyed here, so why is the price one? Nothing was destroyed to produce this machine, so based on Sraffa's own logic, it has no price. Dmitriev's (and Sraffa, Siha, Hodgson, Cohen, Roemer and the rest) model is either not a model of production, as inputs are unchanged, or it is a model of nothing.

Sinha concedes that once a 'surplus' is admitted in the physical price system, it becomes, what Sraffa called 'self-contradictory'. As inputs no longer equalled outputs in aggregate, so the price of a commodity is no longer equal to the commodities destroyed in producing it and 'therefore, we no longer have an equation system, as the right hand sides, either in terms of value or physical commodities, are not equal to the left hand sides'.[34] If there is a surplus Sraffa has no explanation of price.

But why does Sraffa's physical surplus melt away? Let us say all firms decided to increase their prices by 10 per cent to create a price higher than costs. Then the numeraire would also increase by 10 per cent and so nothing real would have happened. Or say that one firm puts up its prices by 10 per cent then it sells nothing. Or say that all firms form a cartel and agree a price increase of 10 per cent, but the numeraire does not change, then assuming there is competition, i.e. more than one firm, if one firm breaks the cartel and sells their output slightly below the rest, but above the cost of production, then the rival firm will capture all the sales and so all the profits, and so on, until the competitive process inevitably reduces all profits to zero. Consequently, there must be some objective factor stopping prices from being reduced to costs. It cannot be a physical factor, as, has already been established, the only common factor to all human production is human labour time. As ownership is exchanged, then the objective factor must be a form of property, the right for one human being to own something, dispose of as they will, to the exclusion of all other human beings. Surplus can only be social not material or material insofar as it is social or in other words a form of surplus value.

Assuming that values equal prices, then the amount of socially necessary labour on the input side equals the amount of socially necessary labour on the output side, both for relative and aggregate prices. As the capitalist pays for the cost of labour or wage but receives labour capacity, so in the process of production value added, or property, is transferred from the labourer to the owner of the means of production. Assuming values modified into prices of production the identity of surplus value and value and price and value is posited, although value has no separate existence from the form of modified values or prices of production. Values no longer equal prices for relative prices but only in aggregate. In aggregate value on the input side equals value on the output side, such that and surplus value is the origin of all profit. Surplus value is redistributed between capitals through the competitive process, but nonetheless, profits do not fall from the sky.

[34] Sinha, op. cit., p.186.

### The tendency of the rate of profit to fall and Okishio's theorem

The law of the tendency of the rate of profit notes that as only variable capital produces surplus value (as only people can own property, and surplus is a form of property) then the rate of profit which includes constant and variable capital must be lower than the rate of surplus value. As fixed capital grows due to the accumulation process, then all things being equal, the rate of profit must fall. Of course there are offsetting factors, but ultimately, the reason why profits must fall is that the growth of the population and so the work force, and so labour hours, and so the rate of surplus value, is limited by the reproduction of the human species, whereas the reproduction of capital is only limited by the capitalist accumulation process itself M–C-M'. The reason the rate of profit has increased during the period of globalisation, and the class struggle essentially disappeared, is due to the decline in the world organic composition of capital with the integration of the formerly centrally planned economies into the world market.

Marx's critics complain that his maths was inadequate to properly understand the question. Unfortunately, Marx did not invent linear algebra which was only discovered after his death. Kurtz, who is particularly unimpressed by Marx's mathematical skills notes that

> It is hardly surprising that, equipped with better analytical tools, economists such as Ladislaus von Bortkiewicz, Piero Sraffa or Nobuo Okishio could provide correct and conclusive answers to problems which earlier authors failed to solve.[35]

Von Borkiewicz and Sraffa have been addressed but what about Nobuo Okishio? Okishio was a post-war Japanese Marxist. Okishio's theorem shows that, on the assumption that prevailing prices do not change, if costs fall, as surplus is the difference between prices and costs, the rate of profit must rise. Okishio's theorem is often criticised as an exercise in Sraffianism it is not. Okishio published his paper in 1961, just a year after Sraffa's[36] *Production of Commodities by Means of Commodities*. Okishio had probably never heard of Sraffa when his paper was released and is explicit that he assumes prices are an expression of labour times. There are some similarities to Sraffianism in his piece, it makes a distinction between basic industries, those industries that produce wage and capital goods, on the grounds that these directly impact the cost of reproduction of labour power, and it speaks of the cost of production of a constant good, whereas all goods change individually and in aggregate so that there can be no material measure of production. These points are moot however, some industries are more directly related to the production of basic consumption goods than others, and so a change in the price of their produces does change input prices more significantly than others, the constant product could be deemed to be a use-value category (i.e. clothes or bread) without changing the substantive argument.

35 Kurz, op. cit., p. 87.

36 Piero Sraffa, *The Production of Commodities by Means of Commodities* (Bombay: Vera, 1960).

The reason Okishio finds that the rate of profit must rise if costs fall, is far more prosaic. Okishio draws a distinction between the productivity criterion and the cost criterion. The cost criterion is the amount of labour directly (in the form of variable capital) and indirectly (in the form of fixed and constantly circulating capital) embodied in the commodity necessary to produce it. Okishio says that these are determined by basic industries, those industries that produce the means of consumption and production that go together to make up costs. This is moot as the wage includes a cultural component. It is unclear if the indirect labour includes transfers into and out of the basic sectors, to equalise profit rates, but again these are not the key points. Okishio then assumes that the productivity criterion is higher than the cost criterion by some unknown amount or arbitrary mark up, this forms the profit. The key point to note is that the mark-up is added without equivalent, it comes from nowhere, and so do not consist of embodied labour, and so has no objective limit.

Values modified into prices of production are still real. The total of surplus value is an actual amount of embodied labour, a cost to the workers who produce it, if not to the capitalists who own it. The aggregate amount of profit realised in the sector consists of profits created in the sector plus or minus a transfer of profits to or from other sectors to equalise profit rates. By assuming that the productivity criterion includes profits produced without equivalent, that it is merely higher than the cost criterion, Okishio severs the objective relationship between profits and surplus value. The innovating capitalist increases their profits by amongst other things increasing the transfers from their rivals. Consequently, the reduction in costs in the innovating industry has no effect on price. As Okishio[37] puts it

> we can safely say that every production technique introduced by capitalists reduces the cost of production in terms of prevailing prices and wages. Therefore, we must accept the conclusion that every technical innovation adopted by capitalists in basic industries necessarily increase the general rate of profit, unless the rate of real wages rises sufficiently.

If prevailing prices are given, then any reduction in cost must increase surplus, as surplus is the difference between cost and price. If, on the other hand, the amount of profits must equal the amount of surplus value in aggregate, then the change in costs will affect prevailing prices in aggregate. If the productivity criterion is a simple mark up over the cost criterion then there is no mechanism for the innovation to change the organic composition of capital and from there aggregate price and profits. If the identity of surplus value and profit is included in the model, in other words, if the surplus added to the productivity criterion is limited by the aggregate amount of surplus value produced in the economy as a whole, then the decrease of costs for the innovating capitalist will certainly increase their profits, but Its effect on overall profit rates will be indeterminate. Prices will change so, the aggregate

[37] Nobuo Okishio, 'Technical Changes and the Rate of Profit', *Kobe University Economic Review* 7 (1961), pp. 85–91, 92.

rate of profit may be higher or lower, depending on the respective impact of the innovation on the rate of surplus value and the organic composition of capital of the economy as a whole.

## Conclusion

Marx's logical-historical method considers that the categories of political economy reflect in modified form, their actual historical development. It provides the key to the defence of the labour theory of value from contemporary criticism. It is found that the assertion that labour is not the standard of value against which human production should be measured, rests on a physical model which excludes production in general, human production and capitalist production in particular. The assertion that simple commodity circulation/production/economy was a form of capitalist production or a distinctive mode of production is false. Von Bortkiewitcz's criticism of Marx's transformation procedure, which identified a discontinuity between values and prices of production, reflects the actual discontinuity, expressed in a crisis of disproportion, that occurred with the industrial revolution. The assertion that surplus may appear without equivalent, is idealist, logically contradictory and incoherent, even if mathematically correct. Okishio's theorem is correct on its own terms, but as it too asserts that surplus appears without equivalent, so it severs the link between costs and prices, and this is the reason it shows surplus rises with a reduction in costs, something that must occur if prices do not fall.

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