

THE LIMITS OF RICARDIAN VALUE: LAW, CONTINGENCY AND MOTION IN ECONOMICS

by Alan Freeman, University of Greenwich¹, 1 November 1998

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The vulgar economists have practically no inkling of the nature of value; hence, whenever they wish to consider the phenomenon in its purity, after their fashion, they assume that supply and demand are equal.

– Marx, Capital Volume I, p269

In order to find out how the simple expression of the value of a commodity lies hidden in the value-relation between two commodities, we must, first of all, consider the value-relation quite independently of its quantitative aspect. The usual procedure is the precise opposite of this: nothing is seen in the value-relation but the proportion in which definite quantities of two sorts of commodity count as equal to each other. It is overlooked that the magnitudes of different things only become comparable in quantitative terms when they have been reduced to the same unit.

– Marx, op cit, p141

1. Introduction: Marx and the Ricardian law of value

In his earliest work on political economy, in a formulation repeated and expanded throughout his life, Marx (1975:260) offers a root-and-branch critique of the Ricardian concept of ‘economic law’:²

Both on the question of relations of money to the value of metal and in his demonstration that the cost of production is the sole factor in the determination of value Mill succumbs to the error, made by the whole Ricardo school, of defining an *abstract law* without mentioning the fluctuations or the continual suspension through which it comes into being.

If e.g. it is an *invariable* law that in the last analysis – or rather in the sporadic (accidental) coincidence of supply and demand – the cost of production determines price (value), then it is no less an *invariable law* that these relations do not obtain, i.e. that value and the cost of production do not stand in any necessary relation.

Indeed, supply and demand only ever coincide momentarily thanks to a previous fluctuation in supply and demand, to the disparity between the cost of production and the exchange value. This is the real movement, then, and the above-mentioned law is no more than an abstract, contingent as one-sided moment in it.³

This counterposes two radically different treatments of the same issue: since value does not appear openly but in the form of price, and since value is unaffected by supply and demand whereas price itself fluctuates with their movement, what possible relation can there be between value and price?

The Ricardian answer, from which Marx demarcated himself for the rest of his life, is to enquire in what ratio goods must exchange in order to equalise demand to supply. Value then reduces to a special kind of price. Marx’s answer, the polar opposite, is to ask what relations make exchange possible, regardless of supply and demand. Price is then explained as a form of appearance of value.

The two conceptions stand opposed as the imaginary to the real. The Ricardian abstract law, supposing a relation that never happens, imposes ideal prices and values on reality. Marx’s ‘no less invariable law’, insisting on a motion which always happens, imposes real prices and values on the imagination.

Economic theory bifurcates with this critique. The purpose of this paper is to explain how.

1.1. Outline of aims

In the long postwar dispute on value, all sides accept that at least two different determinations of the magnitude of value and/or price are under discussion: on the one hand in terms of labour-time in some sense, on the other hand in terms of size, ‘physical quantity’ or use-value.⁴

¹ e-mail a.freeman@greenwich.ac.uk; website <http://www.greenwich.ac.uk/~fa03>

² I am indebted to Julian Wells for drawing my attention to this excerpt.

³ The emphasis on the first two sentences in the third paragraph is mine. According to the translators, in the second paragraph the bracketed words are written above the word that precedes them, that is the word ‘accidental’ is written above the word ‘sporadic’ and the word ‘value’ is written above the word ‘price’

⁴ The surplus approach, in speaking of ‘physical quantities’, does not abolish this divide but disguises it, in the last analysis incoherently, by proceeding as if use-value may be split into two parts, subjective satisfaction and physical measure. In fact, one cannot separate use from being: one may neither acquire the satisfaction in a meal without consuming the meal, nor sell a meal which will never be eaten, without in fact selling something else, a distinct use-value that is no longer a meal.

This paper argues that the determination of the magnitude of either value or price in terms of use-value is both qualitatively and quantitatively incompatible with their determination in terms of labour-time. It traces the logical origin of the use-value concept of value – ‘wealth’ as opposed to ‘riches’ – to the Achilles heel of the Ricardian approach and the target of Marx’s critique, namely the presupposition that supply equals demand.

This approach has evolved into a paradigm – the equilibrium, comparative static or simultaneous approach⁵ – which dominates the whole of economics including post-Sraffian⁶ and most Marxist writing. I will show it renders all such theory incompatible with Marx’s own theory. No reconciliation is possible between Marx’s values or prices of production on the one hand, and on the other classical ‘natural price’, neoclassical long-run prices, or Sraffian prices. The two concepts are both qualitatively and quantitatively different.

Marx’s critique of the Ricardian school led him to an alternative theory of value. The core of this theory is his law of value, which not only embraces his radical alternative to equilibrium but rejects Ricardo’s purely quantitative value concept. For Marx, a quantitative law applies to objects with a qualitatively identical substance or essence. All prices and all values must be reduced to abstract labour, before any law governing their relation can be asserted or investigated. This is impossible in an equilibrium framework, and indispensable in a non-equilibrium framework.

I will show that Marx’s difference with Ricardo goes beyond this qualitative distinction once the economy departs from stasis, that is, in any real economy. Any equilibrium approach then necessarily determines both price and value in the neoclassical manner, by quantity of use-value, and not in Marx’s manner, by quantity of labour time.

This is because neither equilibrium values, nor equilibrium prices, can actually function as prices: they cannot serve as the basis of any actual exchange. Claims that such ‘prices’ are concrete or empirically-accessible are false: equilibrium prices are a concealed value-concept, attempting to explain what is observed in terms of something not directly observed. However unlike Marx’s non-equilibrium values, whose point of departure is an actual market which exists through its motion, equilibrium prices presuppose an ideal market which cannot exist because has no motion. Whereas Marx’s values do exist and do underlie what is observed, equilibrium prices do not exist and cannot underlie what is observed.

This defines their ideological function, since market failure cannot be derived from a theory which assumes *a priori* that the market works. But it also renders them incapable of performing a scientific function, that is, representing reality.

The ‘transformation problem’ does not cease to exist. The relation between such prices and actual market prices must still be explained and measured. It is wished away by a dogmatic assumption, asserted without proof, that equilibrium prices approximate the behaviour of real prices. I will show this is necessarily false because no real prices could be approximated in this way. If, abandoning this dogma, we transform comparative static prices so that goods can exchange at these ratios, the amount of money for which they exchange is determined not by the labour expended in producing them, but by the magnitude of their use-value, directly contrary to Marx’s value-concept.

This problem simply does not arise with either Marx’s values or Marx’s prices of production which, when determined without assuming equilibrium, are perfectly capable of functioning as the basis of exchange and do not violate the determination of value by the magnitude of labour time.

Four appendices support the paper. The first explains our approach to theory, distinguishing interpretation from two forms of dogmatism: *hermeneutics*, or deriving truth from texts, and *solipsism*, or imposing the reader’s meaning on the author’s text. The second appendix provides textual evidence that Marx’s critique of Ricardo became the centre of his developed value theory. The third provides evidence of the correspondence between this theory and the *temporal single-system* interpretation of his value-concept.⁷ The fourth establishes the logical identity between four equivalent concepts in

⁵ This paper argues (appendix IV) that all five of the following concepts in economics are logically identical: the equality of supply and demand or Say’s Law; equilibrium; economic stasis (or proportionate growth); the neoclassical concept of ‘long-run’; and simultaneism – determining values and prices as the solution to a set of simultaneous equations which assume input prices are equal to output prices. My argument is largely cast in terms of Marx’s critique of the Ricardian presupposition that supply equals demand because I want to make it clear that Marx himself differentiated himself clearly both from Ricardo and by implication the modern, Ricardian interpretation of his theory; I will therefore use the words ‘Ricardian’ and ‘equilibrium’ interchangeably. I reserve ‘simultaneist’ to refer to the procedure for calculating values and prices.

⁶ I use the term ‘post-Sraffians’ for those writers of the surplus approach school who specifically assert that Sraffa’s system both explains and supersedes Marx’s value-concept: cf Steedman (1977), Garegnani(0000), Pasinetti(1977), Petri (1998)

⁷ For an introduction to this interpretation see Freeman and Carchedi (1996), or many works on the IWGVT website.

economics: the Ricardian presupposition that supply equals demand (Say's Law); equilibrium, stasis or proportionate growth; comparative statics, the modern form of equilibrium; and the simultaneous or algebraic determination of value and price as fixed points of a self-reproducing system.

2. Quantity and Quality in Marx's critique of Ricardo

Our opening citation is completely unambiguous: in it Marx draws a line in the sand between himself and 'the whole Ricardo school'. Appendix II shows that he maintained this critique throughout his work. Any notion that he was a special kind of Ricardian, or merely a development of Ricardo, should therefore be regarded with the utmost suspicion: At the very least, he did not see himself that way.

But this critique was not the only such divide. Marx's mature work is a systematic critique of Ricardo's exclusive concentration on the *quantitative* aspect of value at the expense of the *qualitative*:

Ricardo's mistake is that he is concerned only with the magnitude of value. Consequently his attention is concentrated on the *relative quantities of labour* which the different commodities represent, or which the commodities as values embody. But the labour embodied in them must be represented as *social* labour, as alienated individual labour. In the price this representation is nominal; it becomes reality only in the sale. This transformation of the labour of private individuals contained in the commodities into *uniform social labour*, consequently into labour which can be expressed in all use-values and can be exchanged for them, this *qualitative* aspect of the matter which is contained in the representation of exchange-value as money, is not elaborated by Ricardo. This circumstance – the necessity of *presenting* the labour contained in commodities as *uniform social labour*, i.e. as money – is overlooked by Ricardo. (Marx 1972: 131)

A key formulation in *Capital Volume I* connects these two critiques:

In order to find out how the simple expression of the value of a commodity lies hidden in the value-relation between two commodities, we must, first of all, consider the value-relation quite independently of its quantitative aspect. The usual procedure is the precise opposite of this: nothing is seen in the value-relation but the proportion in which definite quantities of two sorts of commodity count as equal to each other. It is overlooked that the magnitudes of different things only become comparable in quantitative terms when they have been reduced to the same unit. Only as expressions of the same unit do they have a common denominator, and are therefore commensurable magnitudes. (Marx 1979:141)

Marx's concern to reduce incommensurate magnitudes to a common denominator is often portrayed as metaphysical. And indeed, if supply did equal demand, the qualitative aspect could be safely ignored. When the scales balance, does it matter why? The measurement itself connects the measured objects: what they have in common is 'being weighed'. We can build scales without a concept of mass, which is why they existed long before Newton.

The problem is what happens when they don't balance. With any piece of machinery; you only really need the manual when it breaks. Awkward questions then arise like: how fast does it move? What force does the imbalance exert? What impact does the motion have on the requirements of balance in any case? We then have to connect its components to the rest of nature. Only when Galileo, Newton and their followers asked such 'metaphysical' questions could physics formulate general laws of nature with the general concepts of mass, energy and force.

Economics, when it worries about such matters, resorts to the metaphor of a pendulum, oscillating about a static position.⁸ But there is a vital difference. The pendulum can survive without moving, but the market cannot. Because it must move to exist, its existence can only be explained by its movement. *So rast ich, so rost ich*. A tornado in stasis is no longer a tornado. Like a tornado, an avalanche or indeed a living being, the market exists as a self-sustaining entity only in and through movement;

It is not just that markets fail: the point is that this is how they work. Only when supply differs from demand do the mechanisms which equate them come into play; moreover the very process of equalisation in one sphere disequilibriates all others, whereon eternally restless capital disrupts all balance as it scrambles for gains and stampedes from losses in its thirst for surplus profit, the life force of the market.

There is no economic pair of scales. A market is never in a state which permits exchange at equilibrium prices. From the very outset we have to follow Newton and Galileo, and study its motion with general concepts, the equivalent of mass and energy, which can express all possible exchange relations in terms of unifying concepts, so that we can compare them and say things about them which apply to all of them.

We need, in short, a way of talking about price which *does not depend* on the relation between supply

⁸ See Francisco Louça's very thorough treatment of this idea in the work of Frisch and his contemporaries in Louça(1996)

and demand. We need to enquire qualitatively what the value of a commodity consists of, external to and independent of any subsequent exchange relations it enters into, *before* and *in order* to study the quantitative phenomenon of real market prices.

2.1. Price is a form of value; value is not a special price

In the course of production, capitalists bring sums of money and workers bring their labour-power, and between them they make things that get sold for money. In a certain sense, the entire issue of the value-price relation begins when we ask how this can be possible: how can we add £100 to 1000 hours? All other issues of heterogeneity pale into insignificance beside this; it's the big one.

The Ricardian answer is, as we have seen, that qualitatively 1000 hours is really a sum of money. Value is really just a kind of price, a magnitude of a special use-value, and the only problem is to find out why 10 hours should contribute this amount of money instead of that amount of money. Marx's answer is the complete opposite: it is that £100 is really a sum of hours. Price is really just a form of value, a magnitude of abstract labour time, and the real problem is to find out how £100 gets to represent this amount of hours instead of that amount of hours.

It is a great mistake to suppose that Marx confined his analysis of the value-price relation to prices of production, as appendix III establishes. Unlike Ricardo, unlike Sraffa, unlike Walras, unlike most Marxists, and unlike almost the whole of economics, Marx treated *all* prices as forms of appearance of a common substance – abstract labour time – to which they could be qualitatively and quantitatively reduced. The money price of any commodity, at any time, represents a definite magnitude of this abstract labour time, quantitatively distinct from its value. This value is given in production independent of circulation, the price of the commodity is given in circulation after production, and the value-price relation consists of the relation between these two distinct quantities. Value is thus a universal category which applies to *all possible* market prices. Price, in three words, is a form of value. This is made clear in a vital passage dealing with market price from the *Grundrisse* (Marx 1974:139), given in full in appendix II:

The price of a commodity constantly stands above or below the value of the commodity, and the value of the commodity itself exists only in this up-and-down movement of commodity prices. Supply and demand constantly determine the prices of commodities; never balance, or only coincidentally; but the cost of production, for its part, determines the oscillations of supply and demand...*On the assumption that the production costs of a commodity and the production costs of gold and silver remain constant, the rise or fall of its market price means nothing more than that a commodity, = x labour time, constantly commands > or < x labour time on the market, that it stands above or beneath its average value as determined by labour time.*
[my emphasis]

Almost everything essential is contained in this passage. Market value (price) equates with real value (value) 'never by means of an equation with real value'. Price is 'constantly' determined by supply and demand, its fluctuations 'never balance out' and value 'exists only' in this up-and-down movement. But market value nevertheless is a form of value: its rise or fall 'means nothing more' than that the commodity commands '> or < x labour time on the market.' And this relation between value and price – the 'law' – is established not instantaneously but through the movement of prices so that value appears 'as the law of motions that the former runs through.'

Marx explicitly specifies market price as a magnitude of labour time: a commodity whose price is above its value commands more labour time on the market and a commodity whose price is below its value commands less.

2.2. Money: the general representative of abstract labour time

This requires a novel and still poorly-understood analysis of money. I do not intend here to enter the rich and complex debate about whether it is necessarily a commodity. I think it is clear from his writings, however, that money has two distinct use-values: the use-value of the material of which it is composed (whether precious metal, representative of precious metal, or token of state authority as legal tender) and the use-value of serving as the representative of abstract social labour, as the general means of purchase of commodities.

The transformation of a commodity into money – its acquisition of a price in circulation – does not alter the qualitative fact that everything enters exchange as a 'manifestation of a common substance'. The use-value of money is itself its capacity to represent this common substance – abstract or social labour – and it does so independent of its material form. Price formation is a quantitative modification;

the money price of a commodity represents (outside the exceptional circumstances where supply equals demand) a different magnitude of social labour from the value of the commodity itself:

[I]n the hands of the people whose commodities have been transformed into money, they exist not as exchange-value in the form of a particular use-value, but as use-value (gold, for example) which merely represents exchange-value. A commodity may be sold either below or above its value. This is purely a matter of the *magnitude of its value*. But whenever a commodity is sold, transformed into money, its exchange-value acquires an independent existence, separate from its use-value. The commodity now exists only as a certain quantity of social labour-time...an examination of money – of that absolute exchangeability which the commodity possesses as money, of its absolute effectiveness as *exchange-value* which has nothing to do with the magnitude of value – shows that it is not *quantitatively*, but *qualitatively determined*. (Marx 1972:137)

Whatever the value of the material of money, once it is accepted that supply and demand cannot in general balance, it must be that the labour-time *represented* by money in exchange, that is, the value of its distinct use-value of serving as money, cannot be equal to the labour time involved in producing that material. In his early writings Marx was very clear on this question (Marx 1978:84):

[G]old and silver, as money, are of all commodities the only ones *not* determined by their cost of production; and this is so true that in circulation they can be replaced by paper. So long as there is a certain proportion observed between the requirements of circulation and the amount of money issued, be it paper, gold, platinum or copper money, there can be no question of a proportion to be observed between the intrinsic value (cost of production) and the nominal value of money...Ricardo understood this truth so well that, after basing his whole system on value determined by labour time.. he adds, nevertheless, that the value of *money* is not determined by the labour time its substance embodies, but by the law of supply and demand only.

It has been argued (OPE 1141,1262) that Marx abandoned this view in later life. I think this arises from two sources of confusion: first, neglect of the distinction between the qualitative and quantitative aspects of the function of money, and second, conflating Marx's quite distinct concept of the value of money with the quantity theory of money, which I don't think Marx ever endorsed, and generally treated with scorn.

First, the issue becomes clearer once we recognise that anything which serves as money has two distinct use-values. That which appears, for every other commodity, as a discrepancy between price and its value, appears for money as a discrepancy between the labour-time associated with these two use-values. When all nominal prices rise above values, what does this mean? If silver is the money commodity it means that the silver use-value of the same physical weight of silver now represents less labour-time than the money use-value of the same physical weight of silver. The value of money has fallen, even though the value of silver has not changed. Conversely when all nominal prices fall below values, it means that silver considered as money represents more labour-time than silver considered as a precious metal. Indeed this is the only way to attach meaning to Marx's assertion that money can become a 'depreciated token of itself'. Moreover it offers a rational explanation for the empirical phenomenon of liquidity preference. In a régime of falling prices it makes perfect sense to acquire money because one can make a profit in value terms by doing so: the value that this money represents is rising over time, so that a money asset is growing in value.

Second, in the derivation of money in *Capital* what matters for Marx is not the quantitative determination of value but the qualitative fact of possessing it at all. Since his concern is to derive money without supposing any special properties of money; supposing it is a commodity with a value in its own right is the minimum assumption to make, a point which a later generation, for whom gold is considered special and unusual, often loses sight of. Paper money can be treated as a special kind of commodity which is intrinsically worthless; but those economists who *begin* from money with special properties that set it aside from other commodities, frequently finish by attributing its functions to these special properties. It is then a mystery that almost any commodity can and does replace such special money.

Third, the rate at which money exchanges, once supply departs from demand, must be quantitatively different from the intrinsic value of its material. Our section 2.3 citation (Marx 1979:196) makes this clear. Since no commodity exchanges in proportion to its value, why make an exception for money? At the very least, therefore, there is a concept missing; when any other good exchanges at a rate other than its value, we may speak of its price, and of price-value difference. But money cannot have a price, since it is itself the form in which price appears. Nevertheless, a difference exists between the labour embodied intrinsically in its material, and the labour it commands on the market. This second magnitude is a distinct concept which, I think, is what Marx means when he speaks of the labour

which money *represents* in exchange.

Fourth, nothing in Marx mentions a quantity theory or needs to be interpreted as referring to it. What he says is that the value of money is determined ‘by the laws of supply and demand’. Supply and demand for what? Not for money, but, as he clearly states in his critique of Ricardo’s quantity theory, for everything else: that is, the general process of price formation of all commodities taken together.

The invariance of value in circulation, or conservation of value

The underlying conception, which I discuss at greater length in Appendix III, is in my view the *invariance of value in circulation*, or Marx’s ‘first equality’. In the vital chapter 5 of Volume I of *Capital* entitled ‘Contradictions in the General Formula’ Marx sets out to examine the proposition that surplus-value can arise in exchange. He assesses all possible variations in price, both relative and nominal, and argues that none of them can alter the magnitude of value in circulation. If £50 is the price of corn whose value is 60 hours, and the price of wine of value 40 is £50, then the two may exchange against each other so that the wine-buyer can receive 40 hours (losing 10) and the corn-buyer may receive 60 hours (gaining 10). But the total number of hours in circulation is unchanged; no new value has been created or destroyed, measured in hours. In this set of exchanges, £100 *represents* 100 hours because the total value of the commodities involved is 100 and their total price is £100. The value of the use-value money is established in the same way over all commodities entering circulation.

The magnitude that matters here is not the total money in circulation but the total commodity-capital.⁹ The value of money is determined by the claim it represents on the aggregate social labour that is exchangeable for money. If, therefore, there are goods in circulation whose value is 1,000,000 hours and whose price is £200,000 then each pound represents 5 hours. The *monetary expression of labour-time*, to use a phrase of Rodriguez (1996) and Ramos and Rodriguez (1996), is a relation between the value, and the price, of all commodities taken together, and this is why it is independent of the quantity of money in circulation. The same idea is implicit in the work of New Solution writers (cf Foley 1982, Duménil 1980), although these use the phrase ‘value of money’.

How, then, is the value of a commodity formed in production? How can £100 be added to 1000 hours? Because the £100 already represents a magnitude of social labour in circulation, through being the general representative of value in exchange. The constant capital and the living labour are composed the same homogeneous substance; all that remains is to establish the quantitative consequence by adding them up. This is so simple that it is hard to avoid wondering whether it is not this very simplicity that deters the career academic from accepting it.

The central quantitative question then becomes the following: how is the MELT determined? This has been developed richly in recent literature. This discussion began with the ‘New Solution’ approach of Foley (1982), Duménil (1980)¹⁰ and others and continued with the approach which I designate ‘simultaneous single system’ (SSS): Moseley (1993) and Lee (1983), Wolff, Roberts and Callari(1982). Four suggestions are extant. The New Solution and Moseley define it as the ratio of living labour to money value added. SSS authors except Moseley implicitly define it as the ratio of total value of output to total money price of output, as do some TSS authors (cf Ramos and Rodriguez 1996). I define it as the ratio of the total value of stocks to the total money price of stocks.

Regardless of these differences, what concerns us here is that the MELT cannot be determined simultaneously with the value of the commodities it refers to, because it is formed in circulation and these values are formed in production, independent of and prior to the MELT.

In particular a simultaneous calculation of the MELT leads to the insoluble contradictions. If £100 is spent on cotton in order to produce yarn, and if we insist that this £100 represents the same magnitude of value when the cotton is purchased as when the yarn is sold, then changes in the price of the yarn will retrospectively modify the value of the cotton after its consumption. An equilibrium determination of the MELT is incompatible with Marx’s theory and incoherent in its own right. The central question

⁹ Including money itself. The effect of price fluctuations is to transfer value not only between different commodities but between commodities and money itself. During a general deflation, the MELT falls, that is the ‘value of money’ rises and liquid assets yield a value profit given by the rate (not the size) of this rise. Capital becomes idle and industrial production falls, reversing the price fall. The interaction between the monetary and productive sectors is thus regulated dynamically and cyclically, as is the demand for money and financial assets.

¹⁰ These writers use the term ‘value of money’; the MELT can be thought of as the inverse of this.

of value theory is to determine the MELT without the prior assumption of equilibrium.

Finally, we should ask in passing why a 'principle' that values is invariant in circulation is logically justified. Why shouldn't value increase in circulation? The question answers itself. By making a distinction at all between production and circulation, almost any economic theorist divides all social activity into two spheres, one in which 'something' is produced (production) and another in which this 'something' is distributed, partitioned between the members of society (circulation). This is perhaps one of the most universal distinctions in economics: I can't think of any school of thought which does not try to make it. But if extra value can arise in circulation, this distinction becomes absurd. It means that the activity we have called 'circulation' is not actually circulation but an admixture of circulation and production. It means, in effect, that we abandon the attempt to make the distinction stick at all; we more or less give up trying to make sense of a capitalist economy.

2.3. Value is determined independent of exchange

We can now return to the non-equilibrium determination of the value of a commodity, and demonstrate that it is in fact perfectly determinate.

The first and most basic point is that, in consequence of the function of money as representative of social labour-time, the labour-time which capital represents in the labour-process is not given by the means of production contained in it, but by the money used to purchase them. These goods enter production via the intermediary of money. Capital is precisely abstract value, self-expanding value. The capitalist does not *care* what the money buys; is indifferent to it. The value transferred to her/his product by constant capital, and deducted from her/his profits by variable capital, is transferred or deducted in the form of money. If the inputs rise in price, then more labour is required to acquire them and consequently the product rises in value – exactly as our citation in section 2.1 establishes.

In Volume III this is completely explicit:

[I]f an increase in the price of raw material takes place with a significant amount of finished goods already present on the market, at whatever stage of completion, then the value of these commodities rises and there is a corresponding increase in the value of the capital involved...

Our whole investigation has proceeded from the assumption that any rise or fall in prices is an expression of real fluctuations in value. But since we are dealing here with the effect that these price fluctuations have on the profit rate, it is actually a matter of indifference what their basis might be. The present argument is just as valid if prices rise or fall not as a result of fluctuations in value, but rather as a result of the intervention of the credit system, competition, etc.

Since the rate of profit is equal to the proportionate excess in the value of the product over the value of the total capital advanced, an increase in the rate of profit that arose from a devaluation of the capital advanced would involve a loss in capital value. (1981:208)

Thus if the price – the *market* price – of inputs rises or falls, in consequence a greater or lesser magnitude of abstract labour time is transferred to the product. The value of constant capital is given not by the value of the means of production as such, but by the value which is represented, on the market, by the money with which they are purchased.

The value of a product is now very simple to establish. If £100 is paid for constant capital, we must first determine how much labour-time it represents.¹¹ Suppose this is 10 hours per £. The capital then represents 1000 hours. If then living labour of 1000 hours is expended in working up this capital, its value is 1000+1000 = 2000 hours. That's all there is to it.

What is the relation between the value of a product, so calculated, and the price for which it sells? The answer is: none. There is no necessary relation between the labour time embodied in a commodity, and the labour-time which it realises when it is sold. The necessary relations between price and value apply at the level of the aggregate product in the shape of the invariance of value in circulation. They do not apply to individual commodities.

This is precisely because supply does not equal demand. In consequence, we cannot presume any 'necessary relation' between these two when calculating value:

although price, being the exponent of the magnitude of a commodity's value, is is the exponent of its exchange-ratio with money, it does not follow that the exponent of this exchange-ratio is necessarily the exponent of the magnitude of the commodity's value. Suppose two equal quantities of socially necessary

¹¹ Freeman (1997) establishes a general method for doing this.

labour are respectively represented by 1 quarter of wheat and £2 (approximately ½ ounce of gold). £2 is the expression in money of the magnitude of the value of the quarter of wheat, or its price. *If circumstances now allow this price to be raised to £3, or compel it to be reduced to £1, then although £1 and £3 may be too small or too large to give proper expression to the magnitude of the wheat's value, they are nevertheless prices of the wheat, for they are, in the first place, the form of its value, i.e. money, and, in the second place, the exponents of its exchange-ratio with money. If the conditions of production, or the productivity of labour, remain constant, the same amount of social labour-time must be expended on the reproduction of a quarter of wheat, both before and after the change in price. This situation is not dependent either on the will of the wheat producer or on that of the owners of the other commodities. The magnitude of the value of a commodity therefore expresses a necessary relation to social labour-time which is inherent in the process by which its value is created.* With the transformation of the magnitude of value into the price this necessary relation appears as the exchange-ratio between a single commodity and the money commodity which exists outside it. This relation, however, may express both the magnitude of value of the commodity and the greater or lesser quantity of money for which it can be sold under the given circumstances. The possibility, therefore, of a quantitative incongruity between price and magnitude of value, i.e, the possibility that the price may diverge from the magnitude of value, is inherent in the price-form itself. this is not a defect but, on the contrary, it makes this form the adequate one for a mode of production whose laws can only assert themselves as blindly operating averages between constant irregularities. (Marx 1979:196, my emphasis)

Marx vs the value-form school

Though not the main function of this paper, we must note that this conception differs decisively from the approach of the 'value-form' school who maintain that the value of a commodity is not quantitatively determined prior to exchange.

The reason that price is a form of value, for Marx, is not that value is in some sense incomplete or indefinite until the act of realisation, but quite the contrary, it is because value is defined prior to and independently of price, so that price may clearly be defined *in terms of* this pre-existing value. A commodity enters circulation with a value that is given independent of exchange, in the production process. This value is the sum two parts: the abstract labour time represented by the money spent on constant capital, and the abstract labour time imparted by the workers in production. This is given completely independent of exchange and prior to exchange:

The rate at which two commodities exchange does not determine their value, but their value determines the rate at which they exchange...A quantity of labour has no value, is not a commodity, but is that which transforms commodities into values; it is their *common substance*; as manifestations of it commodities are *qualitatively equal* and only *quantitatively different*. They [appear] as expressions of definite quantities of social labour time (Marx 1972:134-135)

Once this is accepted, the whole mystery of price is abolished: the deviation of price from value consists of nothing more or less than, to cite Marx from the Grundrisse, "a commodity, = x labour time, constantly commands $>$ or $<$ x labour time on the market." Price is revealed as a form of value: the amount of abstract labour time which a commodity commands in the market, as a consequence of the complex interaction of supply, demand and all other social factors. It is, indeed, the quantitative expression of the sum total of all these factors. This is, *inter alia*, what allows us to formulate the concept of unequal exchange and indeed of distribution. A price that differs from value transfers abstract labour time (value) from the seller whose price is low to the seller whose price is high. The price system as a whole distributes a pre-given magnitude of social labour among buyers. Value is the means of quantifying these transfers:

The 'law of value' thus governs a single substance in all its forms: commodity, money, means of production, means of consumption, and so on. Moreover this is unaffected by the non-correspondence of supply and demand. It is a completely general reduction of heterogeneous magnitudes to a single quantifiable substance.

3. 'Labour theory of value' versus 'Law of value': Law in Marx and Hegel as a constitutive element of reality

We are approaching the point where we can contrast equilibrium with temporal determinations by asking what happens when supply and demand fail to equalise. I will show that this leads to a breakdown in Ricardo's *quantitative* solution; that is, the Ricardian neglect of quality leads to a quantitative departure from Marx. This quantitative departure renders the Ricardian and the Marxian

approach incompatible. They constitute, purely and simply, two different theories of value.

Before this demonstration, however, it is useful to see how the point emerges in Marx's own writings and to derive from this the two entirely different theories of the value-price relation and, indeed, of what a theory consist of.

Modern writers use the term 'labour theory of value' amalgamating Marx with the very economists he so trenchantly criticised. Marx never used this term;¹² his phrase was the 'law of value'. This is neither incidental nor secondary to the topic.

The concept of 'law' is particularly central in Marx's own work. For both Hegel and Marx a law is an objectively-given relation through which essence expresses itself as appearance.¹³ It is not something externally imposed on disparate objects, some kind of numerical relation that happens to hold between independent entities: over here we have value, over there we have price, and the law is an empirical relation between them. On the contrary, the fact that a lawlike relation exists between apparently distinct phenomena demonstrates that they partake of a common essence.¹⁴ The law of value is, therefore, an indispensable element of what value *is*; it is a part of the definition of value, to be precise that part of its definition through which it acquires actuality, that which makes its appearance a grounded expression of its existence. It is, in a word, what makes value real.¹⁵

The relations which Marx here seeks to establish are not, therefore, mere statements about the concept of a law, in isolation from the concept of value. In demarcating his own concept of the law of value from Ricardo's, Marx is demarcating a defining element of value itself, in particular the manner in which price, which appears to be external to value, is in fact a form of appearance of value despite their quantitative disparity.

He begins, therefore, from the radical opposite standpoint of Ricardianism which concentrates on the purely quantitative relation that arises when demand equals supply, and iconoclastically asserts the 'no less invariable law' that demand does not equal supply; that they 'do not stand in any necessary relation'.

In doing so he deals with *reality*. Marx's concept of 'accidental' or 'contingent' is just as radically opposed to Ricardo's as his concept of law itself. For the Ricardian school, since the law consists of equilibrium, the accidental consists of deviations from it. For Marx, on the contrary, equilibrium itself is accidental, and that which the Ricardians treat as an accident, Marx recognises as reality.

3.1. *The law of value is a law of motion: motion determines existence, not vice versa*

This conforms to Hegel's profound observation that Becoming is the truth of Being; that which exists appears only through its own self-negation. The concept of law against which Marx polemicises corresponds to that which Hegel defines as an *abstract or forced* identity.

But Marx's law is therefore always a law of movement, in which real law the Ricardian law is 'no more than an abstract, contingent as one-sided moment'. Value appears as price through the fluctuations of demand and supply which really take place, not in consequence of a static relation which does not take place. Consequently, the quantitative relation between value and price has to be expressed dynamically and investigated dynamically. It is not the level of values that governs prices but their movement. There therefore is no definite static relation between values and prices and the search for it is vain. Values govern prices dynamically, and over time.

3.2. *Leaving Las Vegas: determination and existence in economics*

This raises to the forefront the most difficult intellectual problem facing those trained in equilibrium thinking when they attempt to break free of its straitjacket, namely, outside of equilibrium, values

¹² I have not found the phrase 'labour theory of value' (nor 'labor theory of value') in Marx's or Engels' works, even where the index suggests I should. A search of the CyberMarx archive (which does not yet contain, however, Volume III or the Theories of Surplus Value) turns up no references to it. It appears in Kautsky's *Economic Doctrines of Karl Marx* (Kautsky 1925:94) but not centrally or as a defining term. It is used in this way by Lenin in *Three Sources and Component Parts of Marxism*, and modern marxism has probably taken this as its point of reference. Certainly it must account for the enthusiasm with which generations of indexers reference the 'labour theory of value' on pages where the words do not appear.

¹³ Cf Hegel 1995:500 'The Law of Appearance'

¹⁴ This accords with common scientific usage even today. The 'law of gravity' expresses a relation between all objects partaking of the common essence of possessing mass. It governs the forms of appearance of mass, the way in which mass makes itself apparent to us. The laws of thermodynamic govern the forms of appearance of heat and entropy; and so on.

¹⁵ It is worth noting also that in German the word 'law' (*Gesetz*) is linguistically far closer to the word 'posit', a clumsy English rendering of the common German verb *setzen*, to set out, lay down or specify. That which is posited is *gesetzt*, laid down or specified. The many places where Marx speaks of value or price being *posited* should be read with this fact in mind.

appear 'indeterminate'. This is indeed a problem and I will shortly show that it renders such values and prices incapable of representing reality. But in spite of this, equilibrium thinkers find themselves incapable of abandoning the conception. At the centre of this difficulty is the fact that equilibrium thinking and temporal thinking constitute two distinct *paradigms*: they give two different sets of meanings to the concepts involved. Most centrally, they involve different concepts of causation.

In equilibrium, the price or the value of a commodity can be calculated algebraically, because equilibrium can only be sustained by a special set of exchange rates which do not change. This gives a special mathematical relation in which input prices equal output prices. Simultaneous equations can be written down and used to calculate values or prices using this 'fact' – that is, supposing something that never happens. For equilibrium thinking this constitutes a determination of value or price.

But in consequence, the normal everyday meaning of 'cause' or 'determination' has been replaced by a completely different concept: algebraic calculation.¹⁶ In normal language, one thing causes another because one thing leads to another; they succeed each other in time. Though this simple idea has to be refined, it remains the opposite of equilibrium determination, in which time has no place and has to be brought in externally. This idea is so well expressed by Sowell (1974:127) that it is worth citing if only to make clear that this is not a peculiar obsession of the TSS school:

Methods of analysis depend on some assumptions – implicit or explicit – about causation, and some preconception as to what kinds of phenomena should be explained. Causation can be thought of as sequential (A causes B causes C), as simultaneous mutual determination (as in Walrasian general equilibrium), or as a confluence of 'tendencies' whose net result may bear little resemblance to any of the individual elements...during the classical period, both orthodox and dissenting economists tended to conceive of causation in a sequential sense – as distinguished from simultaneous equilibrium – though only Sismondi formalized this in period analysis.

When simultaneous determination is abandoned, equilibrium thinkers fall into an abyss where nothing is known. It seems as if, without the comforting but illusory faith of an ordered, stable and unchanging exchange of equivalents, nothing is left but chance and caprice. David Laibman (1999) has argued, for example, that temporal determination in effect deprives economics of any theory at all.

But the wildest casinos have laws, and just as a great deal can be said about the universe without hypothesing a God, a great deal can be known about the most chaotic of markets without presuming that they are perfect.¹⁷ There is nothing to stop us determining the value of a commodity outside of equilibrium, once we stop making equilibrium a necessary part of its determination.

All we need do, as already indicated, is add together the constant capital consumed in its manufacture, measured in hours and given by its price at the time of use, and the living labour applied to this constant capital, likewise measured in hours. That is, all we need do is confine our attention to the 'immediate process of production' itself, from which the commodity emerges with a clearly-defined value irrespective of, and independent of, whether it is sold and for how much it is sold.

In a nutshell, this is the TSS interpretation: it is completely determinate, since we have not imposed any prior requirement on input prices. The price of constant capital comes from simple observation: if a capitalist combines £100 in cotton with 1000 hours of labour, and if £10 represents 10 hours of social labour, then the value of the yarn is $1000 + 1000 = 2000$ hours.

Given the price of the cotton, this is a completely determinate calculation of the value of the yarn. Such a procedure is universal in the rest of science. No astronomer, in calculating the position which a planet will occupy in the year 2000, demands to know why this planet is in its current position. S/he takes the current position and motion as given, and predicts the future from it. All laws of motion take this form. We need only know the initial conditions at some definite point in time, and the whole of the rest of the motion can be as determinate as we wish, depending only on the complexity and concreteness of the empirical laws we assert.

In passing we should note that it is a complete misnomer to treat the distinction between the above and equilibrium valuations as a distinction between 'historical' and 'current' cost. The value transferred to the product is not given by the magnitude of capital when purchased; it is given by the magnitude of

¹⁶ The clearest and first statement of this phenomenon appears in Shaikh (1982), though Shaikh does not locate the origin of this change in meaning in the equilibrium paradigm.

¹⁷ The parallel is a just one. Ricardo's heirs seem obsessed with rendering prices determinate, but there is no need at all to suppose them static in order to do this. Laplace had no problem in bringing determinism to a chaotic universe without any recourse to divine perfection, by systematically substituting laws of motion for laws of form. This may not be what we want to do in economics, but if anyone seeks to do so, the hypothesis of a static and perfect economy is completely redundant.

this capital when it is used. This *is* its ‘current’ cost. The equilibrium determination substitutes a completely different notion, redefining the word ‘current’ to mean ‘future’; it says that the value transferred by the cotton is given by what the cotton *will* cost when it has been produced using a technology that does not exist at the time it is used. It redefines also the word ‘necessary’ to usurp Marx’s meaning, as I show in Appendix II. ‘Necessary’ for Marx means that which can be achieved under existing social conditions, that is, using the machinery which is now in place. Necessary for the equilibrium approach means that which can be achieved under ideal social conditions, that is, using the most advanced machinery in existence whether or not it is in place.

The whole idea appears perverse only to economists of the equilibrium persuasion, who appear to feel that reality is too important to leave to nature. The equilibrium calculation cannot accept that the price of the cotton is simply what we find on the market. It has to determine not just the results of production but its preconditions, insisting that the cotton must enter production at the same price it leaves it. There is no reason in nature to suppose this; the only reason is that, on the basis of faith alone, it is alleged to approximate nature better than nature herself. In fact, it does not approximate nature better than nature does, as I will shortly demonstrate. The method of equilibrium fails the most basic test of science: it cannot explain what we actually observe.

There is no reason at all to suppose, just because the cotton cost £100 in 2000 when the new crop emerges, that it has to have cost £100 in 1999 when the old crop entered the yarn. Unless, of course, one is unable to determine the ‘price’ of the cotton otherwise, because this assumption is the only one which makes the equations work. But once we bend to this requirement, we have already lost the battle with nature: we have opted to confine nature instead of expanding our brains. When we do that, nature has won: our own pettiness has deprived us of the right to be the masters of our own spirit.

The relation between value and price is not lawless; it is the subject of *laws of motion*. Precisely because value regulates price over time, there is no instantaneous relation between them – any more than the law of gravity requires the moon to be in a particular position. This does not mean there is no quantitative relation between value and price; it means that *no a priori* restriction is placed on this quantitative relation, so it can be the subject of a genuine empirical investigation. For the first time it opens the way to the formulation of genuine laws based on observation instead of pseudo-laws based on calculation.

3.3. Ricardian values are indeterminate outside of equilibrium

Let us now contrast this with the Ricardian formulation.¹⁸ This argues, essentially, that value can only appear as price when supply equals demand. The consequences have been somewhat incompletely digested by modern economics. The problem is this: how does value appear when supply is *not* equal to demand? The issue is not so much that equilibrium values are in this situation in some sense aberrant or awkward to handle: they are not even defined.

What happens when the economy does not conform to the contingent state in which value is equal to price? What can be said, from the Ricardian point of view, about a real economy, in which ‘demand and supply are never equal, or only coincidentally’? Actually, nothing at all. Value is indeterminate, price is what we see in the marketplace, *et voilà tout*. No solvable set of equations for the magnitude of either value or price exists, unless supply and demand are equal.

A mountain of metaphysical balderdash has been heaped on this simple fact. The most central point has been disguised; namely, the equilibrium determination of any magnitude does not determine this magnitude outside of equilibrium.

3.4. The origin of a dogma

This is not understood to be a problem by most economists, who in effect declare that it doesn’t matter: we can calculate values and prices ‘as if’ supply equalled demand. To understand the difficulty, let us apply the same reasoning in a different context. What would we think of a grocer who sold us some carrots which *would* weigh a pound *if* the scales balanced, but refused to actually weigh them? Or worse still, popped a pound weight on the scale, grabbed the bag as the pointer swung past zero, and claimed to have weighed out a pound of carrots?

It cannot be insisted enough that, though the analogy of a balance is a complete commonplace in

¹⁸ according, of course, to Marx’s interpretation

economics it is actually completely inappropriate. Scales can actually be observed at rest but the market cannot. Weighing supposes circumstances which really exist. Ricardian values suppose circumstances which cannot exist. The equilibrium determination of weight is rooted in reality; the equilibrium determination of price is rooted out of the imagination.

Faced with this, economics makes a leap of faith. First it asserts, without proof, that we can use the data from an out-of-equilibrium economy to calculate the values and prices which *would* pertain if the economy were at rest – and, we should note, ‘rest’ implies a completely different set of economic proportions, since for example any shortfall implies that a sector of production is insufficiently developed to meet need. Second, it asserts again without proof that this is justifiable because such equilibrium prices regulate observed prices, appealing to vague arguments that all science makes abstraction and everyone approximates. Third, and most damning, it ignores contrary evidence that is plain for the whole world to see – cyclic crisis, growing inequality, and a blatant failure of markets to work the way they are ‘supposed’ to – and constructs esoteric empirical ‘proofs’ that its predictions regulate reality which, on closer examination turn, out to be internally circular and produce nothing but purely logical facts, of the same empirical worth as the proposition that all four sides of a square have the same length.¹⁹

Let us take these ideas one by one. First, just because everyone makes abstractions, it doesn’t mean that any abstraction will do; we must distinguish good abstractions from bad. Abstractions like Marx’s begin from the general properties of things that really exist. Abstractions like Ricardo’s begin from the particular properties of things that can never exist. Marx’s is *better*; indeed the Ricardian construction actually has no foundation in reality; it is a circular mind exercise. Why do equilibrium prices approximate real prices? Because we define real prices as an accident, so that any actual deviation must be the result of an exogenous factor. There is no *logical* proof at all involved.

Second, how can any law of motion of values or prices be asserted? The modern variant of Ricardian equilibrium, comparative statics, attempts to define a law of motion as a succession of instantaneous equilibria. But how can such a set of equilibria participate in any dynamic determination of price either by value or by Ricardian or Walrasian equal-profit-rate prices? In order for prices to move, they must depart from equilibrium. The process of transition requires that goods trade at prices different from those of the theory. But this means that these prices are not actually prices at all, in any normal sense of the word. They are not *actually* the rate at which goods exchange on the market. Moreover and most decisively, if goods were to exchange at these prices, all the magnitudes involved would be different, as we shall shortly show. The contradiction leaps to the surface once we ask the simple question: how could a real economy actually move from one state to another, using these prices?

Third, what would constitute an empirical falsification of the proposition that either Marxian comparative static values or Sraffian/Walrasian prices regulate observed prices? We have already seen that the Ricardian conception is obliged to treat every deviation from equilibrium as an accident. In modern economics this takes the form of treating deviations from prediction as *exogenous*. When the economy deviates from ‘perfection’ this is never treated as an endogenous consequence of its motion; it is treated as a ‘shock’, as the result of political interference, as an ‘imperfection’, in short as something non-economic. But on this basis one can explain anything. *By definition* if the market doesn’t behave as the economists predict, something other than economics must be to blame. Consequently, the propositions of economics as such can never be tested, and never are.

This emperor has never had any clothes. All that is left, for the Ricardian argument, is to assert as a matter of faith that the real world is by definition an approximation to the imaginary world of equilibrium, and to explain all departures from this imaginary world as ‘imperfections’ or – in Marx’s terms – ‘accidents’. Moreover this particular aspect of Ricardian reasoning has become the common heritage of virtually the whole of economics, apart from its heterodox fringes. Modern economics in effect defines the real world as an accident. This is a true dogma; an unverifiable proposition which, by its very nature, cannot be tested, and can only be accepted as a matter of faith or creed.

The comparative static, or equilibrium ‘determination’ of price and value is a pure dogma, of the same epistemological status as the assertion that God’s existence is proved by personal faith: an assertion for which not only is there no evidence, but for which evidence cannot possibly be presented, by virtue of the nature of the assertion.

¹⁹ See Freeman (1997)

4. The difference makes a difference: the transformation of quality into quantity in the absence of equilibrium

The first difficulty in disputing any theory which is held as a matter of faith is in demonstrating that an alternative way of thinking is even possible, since faith organises itself to shut out doubt. The first shots in any battle against totalitarian orthodoxy come not from the cannons of reason but the popguns of toleration.

I have approached the problem first by demonstrating that TSS is a *possible* interpretation of Marx's value theory; that there is a coherent reading of Marx's own texts which leads to the twin conclusions that Marx's values were temporal, and that money stands in them in the role of the general representative of abstract labour, in which form capital enters the transformation process.

I now contrast this interpretation with the equilibrium interpretation of Marx, including specific numerical examples that demonstrate the quantitative disparities that result.

I will show that under these conditions the qualitative difference between Marx and Ricardo leads to quantitative discrepancies. I shall show that this quantitative discrepancy results because the comparative static method fails to yield a determination of value by the magnitude of labour time. I shall finally show that the comparative static method in its own terms is internally incoherent and fails to provide a determination either of prices, or of values, that is consonant with any possible reality.

In sum, Marx interpreted temporally is coherent and consonant with reality; Marx interpreted as a Ricardian is incoherent; Ricardo interpreted as a Ricardian is incoherent and inconsonant with reality.

If we wish to understand either Marx, or reality, no Ricardian interpretation of anything works. The appropriate procedure for any scientific endeavour is to abandon the Ricardian project and re-assess Marx's.

There is a difficulty of saying what the Ricardian approach means, outside of Ricardian assumptions. Equilibrium interpretations of Marx exhibit a peculiar dichotomy: they determine value statically and apply it dynamically. In consequence, they never enquire whether the motion of the system might modify the determination of value – which, in a certain sense, is the entire issue. We confront the problem that we cannot criticise what they say about value in a moving economy, because they don't say anything about value in a moving economy.

I shall concentrate, as far as I can, not on what Marx's critics or interpreters have said, but on what is *logically possible* on the basis of the most universally-accepted generalisation of the equilibrium determination of value, the comparative static method. Thus my arguments are not, on the whole, directed against specific critics or interpreters of Marx (though where necessary I shall refer to them) but against what, I hope to show, are the necessary logical consequences for the determination of value, of interpreting Marx in a comparative static manner.

4.1. Comparative static and temporal definitions of value under changing productivity

We first deal with rising productivity, supposing a market economy producing a single good with steady technical change, such that with a constant labour force, outputs and inputs rise continuously but outputs rise faster than inputs. For simplicity we suppose workers consume nothing.²⁰ We suppose the entire product each year is invested, for maximum clarity.

We have chosen a sequence (see Table 1) generating whole numbers but the reader can obtain the same qualitative results for any sequence satisfying these assumptions.

Period	C (use-value)	L (use-value)	Produces	X (use-value)
1	10	10	→	12
2	12	10	→	15
3	15	10	→	20
4	20	10	→	28

Table 1: use-value, maximum expanded reproduction

where C = consumed constant capital, L = quantity of labour power, and X = output

²⁰ If the reader finds this uncomfortable, s/he may suppose that a fixed proportion of the input is used to feed the workers; the results are numerically the same.

The comparative static calculation yields table 2.²¹ For example, for period 1,²² we have

$$10 \times v_1 + 10 = 12 \times v_1$$

that is

$$v_1 = 10 / (12 - 10) = 5$$

Period	v	C hours	L hours	Equals	X hours
1	5	50	10	=	60
2	3.33	40	10	=	50
3	2	30	10	=	40
4	1.25	25	10	=	35

Table 2: simultaneous values

A number of conclusions are taken as ‘standard’ in the normal interpretation of Marx:

Conclusion 1: values are directly determined by the use-value structure of the economy. For each row in table 1 there is only one possible row in table 2. Values are ‘redundant’; use-values determine all the properties of the economy.

Conclusion 2: organic composition falls, and the rate of profit rises, with technical progress.

Profit is directly given by the physical structure of the economy, so we just subtract the physical input from the physical output and divide by the physical input.

Period	C (use-value)	X (use-value)	X - C (use-value)	$R = \frac{X-C}{C}$
1	10	12	2	0.2000
2	12	15	3	0.2500
3	15	20	5	0.3333
4	20	28	8	0.4000

Table 3: physical profit rate

These conclusions are quite conventional in the simultaneous paradigm. However, a number of stranger conclusions spring to the eye.

Conclusion 3: values so defined cannot function as prices. Although values are defined as special prices, they cannot function as such. The product at the end of period 1 is sold for 5 hours per unit. But when used as an input in period 2, it is bought for $3\frac{1}{3}$ hours per unit. These prices cannot sustain actual exchange.

Conclusion 4: the value added to the total product is not equal to the time worked. At the beginning, we had 50 hours worth of input. Consider the combined effect, now, of periods 1 and 2. No product was consumed except in production. Living labour added 10 hours in each period, 20 altogether. We should have 70 hours worth of product. But we only have 50. 20 hours have been lost.

Conclusion 5: the value added depends on the length of the period: If we double the accounting period by amalgamating periods 1 and 2, we find that 22 units of C combined with 20 units of labour produce 27 units of output giving $v = 4$. Now 20 hours have been added to the product.

The period is an arbitrary accounting construct: it is hardly surprising the organic composition falls, if we can throw away half the value of the capital whenever we feel like it.

Conclusion 6: value can be created from nothing. It is common for the problem of value loss to be dismissed, or even welcomed, because it does not make extra value appear. But if we suppose a decrease, instead of an increase, in productivity, then the inputs to each period will be greater than the output of the last period. Moreover, the greater the decrease, the more value from nowhere, so that the most productive approach is to do nothing at all but wait for nature to make inert copies of itself.

Monetarising the simultaneous value concept

How *could* such an economy function according to sensible market rules, that is, in such a way that the

²¹ Using Bortkiewicz’ supposition – which has become standard – that input prices = output prices in each period. In the appendix we demonstrate this is mathematically equivalent to the proposition that demand = supply in each period.

²² The time at which any variable is measured will from now on be represented with a subscript: for example C_t is constant capital at time t . For period (discrete) systems t indicates a measurement made at the beginning of period $[t, t+1]$.

money paid for a commodity is equal to the money received for it? What happens if we ask equilibrium values to live up to their claims and function as prices?

This would happen if, for example, at the end of period 1 we purchased one hour of labour with $\$60/40 = \1.5 ; if at the end of period 2 we devalued by a further $50/30$, at the end of period 3 by a further $40/25$, and so on. Defining e to be the ratio between dollars and hours we have:

$$e_0 = 1$$

$$e_1 = 60/40 = 1.5$$

$$e_2 = 60/40 \times 50/30 = 2.5$$

$$e_3 = 60/40 \times 50/30 \times 40/25 = 4$$

and we can write a table of *money* transactions in this money, thus:

Period	\$p per unit	\$C	\$L	Equals	\$X
1	5	50	10		60
2	5	60	15		75
3	5	75	25		100
4	5	100	40		140

Table 4: corn-money; monetarising simultaneism

Now we have a set of transactions that makes monetary sense: the money paid for everything is equal to the money received for it. It also yields the same profit rates as table 2. But we have revalued the contribution of labour-power in each period by an amount exactly equal to the increment in its productivity. In consequence, the prices, down the lefthand side, are simply 'corn-prices'; they use the commodity itself, instead of labour, as numéraire. The only difference between a simultaneous 'labour-value' system and corn-values is the numéraire; when we adjust this correctly in each period to permit values to function as prices, there is no difference. Simultaneous valuation yields a *use-value* concept of value.

An incoherent measure

One further point: this procedure is in general incoherent for more than one sector. If, for example, the output of period 1 yields values of (1,2) and the next period requires input values of (2,3) then *no* monetarisation makes exchange possible. This reflects the fact that, because use-values are heterogeneous, there is no unique coherent use-value measure.

In such circumstances, of course, goods might exchange at prices other than values, a circumstance we will shortly study. But this does not wish away the problem; prices might also be (1,2) followed by (2,3) and could not serve as the basis of exchange. Moreover it renders incoherent any idea that value is a special kind of price. Finally this is *not* the result of capital mobility but of technical change *tout court*: yet another nail in the coffin of the idea, rejected in Appendix III, that Volume I of *Capital* refers to a mythical economy where goods exchange at values.

The temporal calculation

The temporal calculation permits outputs to differ in value from inputs. These are given, not by solving a simultaneous equation but a difference equation corresponding to the temporal order of the circuit

$$M-C-P \dots C'-M'$$

We suppose an initial value v_0 , as with any difference equation, which reflects a past history we do not know. It can be demonstrated that any errors that might result decay exponentially. Here, for illustration, we begin with the simultaneous value, 5. In period 1, we then calculate v_1 as follows:

$$10v_0 + 10 = 12v_1$$

that is

$$10 \times 5 + 10 = 12v_1$$

giving

$$v_1 = 5$$

So far this is the same. However in the next period we find

that is

$$12 \times 5 + 10 = 15v_2$$

giving

$$v_2 = 4^{2/3}$$

This is greater than the simultaneous value, but less than the old value. Value has declined, but has not fallen as far as in Table 2. This gives a distinct *value* rate of profit, different from the use-value rate, as table 5 shows.

Period	v (hours per unit)	C hours	L hours	X (use-value)	X hours	X-C hours	$R = \frac{X-C}{C}$
1	5	50	10	12	60	10	0.2000
2	$4^{2/3}$	60	10	15	70	10	0.1667
3	4	70	10	20	80	10	0.1429
4	$3^{3/14}$	80	10	28	90	10	0.1250

Table 5: temporal values

Values still fall, but more slowly, and so the profit rate falls exactly as Marx suggests, despite the steady cheapening of commodities. The ‘experts’ are wrong; there is no logical error in Marx’s idea. Moreover:

- (a) Goods are bought for exactly the amount of money for which they sell. This system is compatible with an exchange economy.
- (b) No value is ‘lost’ and no value appears from nowhere. The only source of value is living labour.
- (c) A variable numéraire is not required for the economy to behave in a reasonable monetary manner. The value contribution of labour-power is always exactly given by the time of labour.
- (d) Value added is independent of the accounting period.

4.2. Static and temporal definitions under a changing MELT

If the MELT is changing from one period to the next, the difference between simultaneous and temporal approaches is this: does the same MELT apply at the beginning, as at the end, of the period? If so, value appears in circulation. To demonstrate this I use the assumptions and notation in Moseley (1993); since his MELT calculation is the same as the New Solution this brings out the contradiction in both approaches. I may have reproduced these wrongly, but I can be corrected: my aim is a clarification of the temporal-simultaneous distinction rather than a refutation of Moseley’s calculation.

We suppose simple reproduction, with constant conditions of production. Values are thus constant and the choice of so-called ‘replacement’ or ‘current’ cost cannot affect the outcome. Following Moseley, only values are presented so that the results are indifferent to the use-value structure.

We begin by supposing 100 hours constant capital are consumed in each period with 100 hours of living labour, so that output is 200 hours. Suppose one half the output is consumed by either workers or capitalists, and the rest re-invested, re-creating the original conditions. We use Moseley’s notation, with L_p for constant capital in hours and C in money, N for labour power, and P for output in money. In all periods therefore:

$$100(L_p) \text{ hours} + 100 (N) \text{ hours} \Rightarrow 200 \text{ hours}$$

Suppose that in price terms:

$$\text{Period 1: } \$100(C) \text{ and } 100 \text{ hours } (N) \Rightarrow \$200 (P)$$

Define the MELT, m , as money value added (\$100) divided by living labour (100 hours), so $m = 1$. No inconsistency arises so far. However, now suppose that in period 2, outputs sell for \$180:

$$\text{Period 2: } \$100(C) \text{ and } 100 \text{ hours } (N) \Rightarrow \$180 (P)$$

Money value added is now \$80, so $m = \$0.80/\text{hour}$. Now there is a problem: if m is to be constant throughout, \$1 has to represent the same amount of value at both beginning and end of period 2, namely 1.25 hours. But all magnitudes of value must conform to the same relation; every hour must be represented by \$0.80. However, \$100 was paid for period 2’s inputs. Therefore, the value they contribute to the product must have been 125 hours, not 100 hours. The value equation must be *rewritten* in the light of the prices assigned by circulation to the outputs. It should read:

$$\text{Period 2: } 125(L_p) + 100(N) = 225 \text{ hours}$$

But these same inputs make up half of what was produced in period 1, when their value was half the output of that period or 100 hours. *Circulation* has created 25 hours of extra value. Constant capital has been revalued by deflation – moreover, after being consumed. The inescapable conclusion is that the value of inputs depends on the price level when the outputs are sold. Indeed it is not even determinate until the output is sold: only when we ascertain that the output of period 2 is sold at \$180 can we value this period’s inputs. This is stronger even than the proposition normally made by the value-form school, that the value of a commodity is determined when that commodity is sold. If flax is used to make linen, then the value of the flax is now unknown until the *linen* has been sold.

Finally value now depends on the money of account. If, for example, we specified prices in Yen and this deflated half as fast as the \$, the value of inputs would be lower.

4.3. Transformation is not just Marx’s problem: Sraffian prices and real exchange

The most insistent claim in the modern debate around value theory is that the transformation problem is unique to Marx, because only he explains price in terms of a concealed essence. Implicitly this makes a false claim for both marginalist and Sraffian prices, namely, that they are the same as real prices and that, therefore, nothing is concealed and nothing needs to be transformed.

Nothing could be farther from the truth. These prices are not only distinct from actual prices but cannot be otherwise because as we have seen they cannot serve as the basis of any possible exchange. Actual prices do *not* equal Sraffian or Walrasian prices, actual employment does *not* equal the ‘natural employment rate’, actual inflation does *not* equal the natural unaccelerated rate, and these differences have to be explained both empirically and practically. The transformation problem belongs to all economics, whose two opposed value systems both explain what we can directly observe as an effect of something we cannot directly observe. The one must therefore be transformed into the other. How?

The equilibrium answer, we have seen, is intrinsically dogmatic: *by definition*, what we observe directly must be an accidental deviation from equilibrium. I will show that this is not possible; that is, on Sraffian assumptions, in general no set of actual prices can behave in this way.

We approach this with a simple question: under what circumstances can Sraffian prices form the actual basis of exchange, and if we compensate for their failure to do so, what becomes of the standard Sraffian assumptions? To highlight the problem we suppose, as one always must do in investigating the real contradictions of an equilibrium hypothesis, a *secular* change in the technical coefficients. Consider a two-sector economy with constant labour inputs, and a constant department II, but where department I steadily consumes and produces more use-values.

Table 6 is an example which the reader can easily extend to later time periods. C and L are the total use of capital and Labour respectively, c and l are the technical coefficients.

t	C(I)	C(II)	L(I)	L(II)	X(I)	X(II)	c(I)	c(II)	l(I)	l(II)
1	10	20	20	10	30	30	0.33	0.67	0.67	0.33
2	11	20	20	10	32	30	0.34	0.63	0.67	0.33
3	12	20	20	10	34	30	0.35	0.59	0.67	0.33
4	13	20	20	10	36	30	0.36	0.56	0.67	0.33

Table 6: two-sector economy, use-values and technical coefficients

With a real wage of 0.5, equilibrium equal-profit-rate prices and profits yielded by this sequence, in terms of labour units as numéraire, are given in table 7:

r	$p(I)$	$p(II)$
0.37	0.84	1
0.39	0.89	1
0.40	0.93	1
0.42	0.97	1

Table 7: Sraffian prices from table 6

These prices cannot be used for any actual exchange. The output of department I from period 1 is sold for 0.84 per unit. But in the next period it is purchased at 0.89. No known form of exchange permits the seller to receive 5 cents less than the buyer pays.

Against this, the implicit argument in equilibrium reasoning is to say that, although such prices cannot function as the actual basis of exchange, they can nevertheless empirically approximate an actual sequence of exchanges.

But they cannot. A sequence of exchanges which is approximated by Sraffian prices, and conforms to Sraffian assumptions, cannot exist. It is logically impossible for equilibrium to serve as the regulator of any actual sequence of market prices without violating one or other of the fundamental principles of the approach. *Either* the rate of profit fails to equalise and in fact diverges, *or* the actual sequence of prices diverges from Sraffian prices.

We illustrate this with two possible sequences that might be regulated by Sraffian prices. First, suppose that at the beginning of each period, the capitalists purchase their goods for the offer price of the previous period. In that case we have to recalculate the profits of each period as the difference between actual sales and actual purchases. Then, as an alternative, let's suppose that in each period the profit rate is given by the Sraffian calculation – which should be fair enough, since profit rates are supposed to be a function of physical magnitudes alone – and recalculate prices, by adding a markup yielding this rate to the cost of inputs at actual prices.

Figure 1: Ratios of actual to Sraffian profits under exchange at Sraffian prices

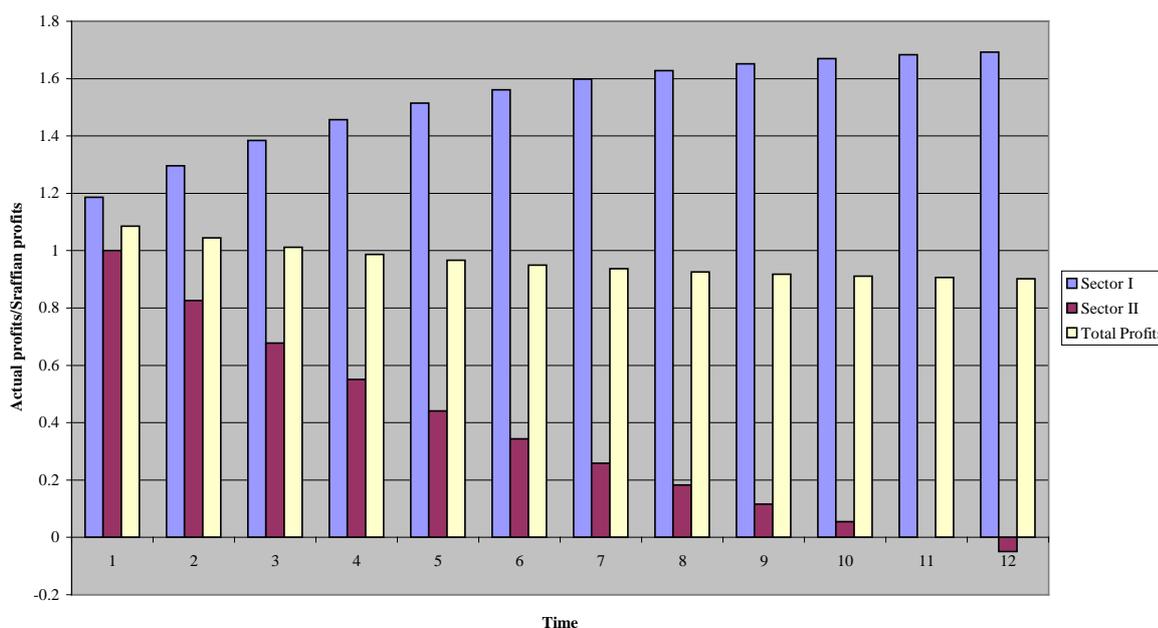
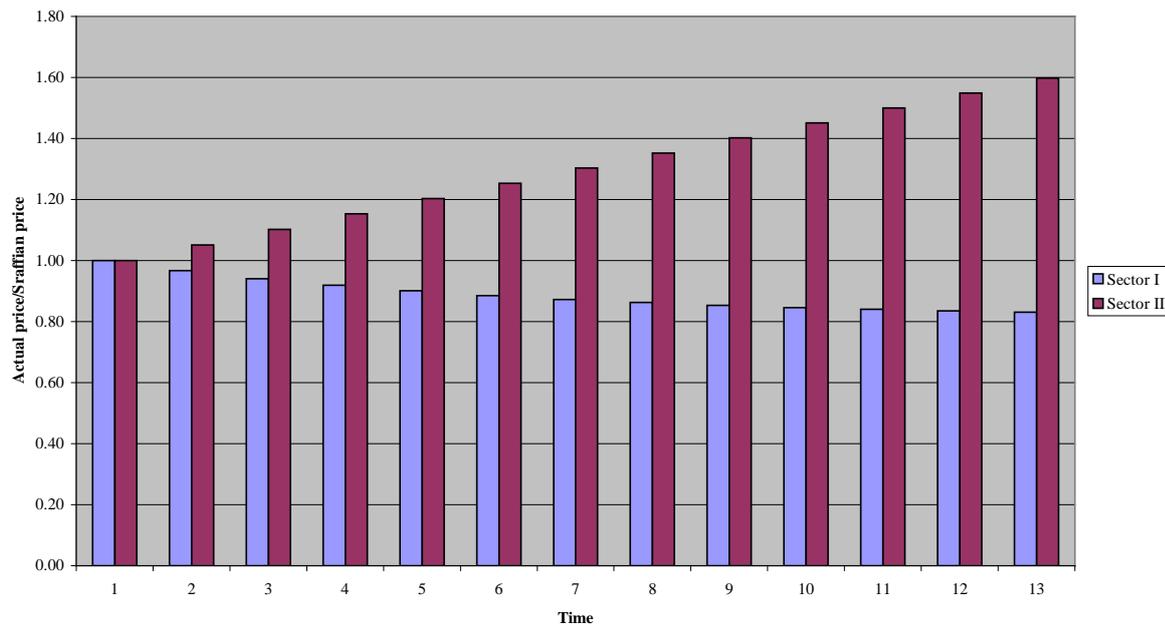


Figure 1 shows the graphs of sectoral profit rates resulting from assumption 1, compared with the predicted Sraffian profits. Figure 2 shows the graph of sectoral prices resulting from assumption 2, compared with predicted Sraffian prices. In the first case, the sectoral profit rates diverge, and indeed become negative in sector 2. In what sense, then, are Sraffian profits the regulator of observed profits? In Figure 2 the sectoral prices diverge, in one case becoming systematically higher than Sraffian prices and the other case systematically lower. In what sense are Sraffian prices their regulator?

Figure 2: ratios of actual prices to Sraffian prices, assuming Sraffian predicted profit rates



4.4. Marx's prices of production

The Sraffian may ask whether the same problems arise when prices of production are calculated, temporally, on the basis we attribute to Marx. In a certain sense the question is misguided, but the answer is 'yes'. From a TSS perspective there is no requirement to 'determine' prices and therefore prices of production can be calculated for any price sequence. Any set of money prices serves as the basis of actual exchange because the TSS assumption is that goods are purchased for the same price that they are sold at.²³ There is no requirement that the rate of profit should actually equalise. Prices of production arise from the formation of an *average*, not a uniformly equal, profit rate, and they are calculated therefore in the following way:

- (i) calculate the value of both constant and capital at the market prices prevailing when production begins, reducing these to abstract labour using the MELT
- (ii) calculate the mass of profit as living labour less variable capital
- (iii) calculate the rate of profit as the above mass, divided by the sum of constant and variable capital
- (iv) calculate prices of production in value terms by applying this profit rate to the value of capital in each sector, as calculated in step (i)

This yields prices of production but to iterate the sequence we require the MELT for the next period. This is obtained by the following steps:

- (v) calculate the total price of outputs at the market prices prevailing when production ends
- (vi) calculate the total value of outputs by adding living labour to constant capital
- (vii) Divide the result of (v) by the result of (vi)

The direction of derivation is therefore the reverse of the Sraffian method, in that the calculation proceeds always on the basis of actual market prices, but reduces them to abstract labour, production prices apply the average profit, so yielded, to sectoral costs. There is of course no dispute that production prices could themselves act as the basis of exchange, since any set of prices can do so. However, this is not the primary purpose of the category of production price, as appendix III shows.

The decisive point is the relation between an arbitrary set of market prices and the underlying prices of production. To illustrate this we have *randomised* market prices and present the movement of prices of production beside the market prices that they shadow. The procedure for randomisation was as

²³ It says something for the current theoretical state of economics that one has to state this as an assumption.

follows: for each sector, calculate a random markup between 0 and 0.8; add this to costs at purchase price, and divide by total output. TSS prices of production were calculated as indicated above.

Figure 4 shows the resultant market prices, compared with TSS prices of production, in sector I and Figure 5 shows the same in sector II.

4.5. *The regulation of market price by production price: an empirical law*

We make no claim, of course, that a Monte Carlo exercise of this nature provides actual information about the law of value as it operates empirically in the world – though the same exercise can be undertaken, using the calculation specified above, for empirical data, using the method for example specified in Freeman (1997) which extends the calculation to account for the presence of stocks.

However, it illustrates two vital concluding points about the possible form that this empirical law can take. First of all, though market prices clearly ‘track’ production prices, the correspondence is by no means exact. Although it is the case that the general tendency of the two sets of prices is the same – that is, they move together – it is easy to construct market price sequences in which, for example, market prices are systematically higher than production prices.

The question then arises: what *actually* happens? In the world we live in, do market prices shadow production prices in every sector, do they shadow them only in some sectors, does this vary depending on market régime, and so on: that is, we confront a phenomenon that genuinely depends on empirical circumstance: it is not a purely logical construct, as is the instantaneous correspondence between price and vertically-integrated labour coefficients identified by writers such as Ochoa, Petrovic, Cockshott and Cottrell, Steedman and Shaikh (0000) (see Freeman 1997 and Kliman’s paper to this conference for a proof of this point)

In my view this is how Marx viewed the actual regulation of market prices by prices of production. When he writes about this phenomenon, he refers always carefully to empirical circumstance and clearly has in mind actual sequences of prices that he has carefully studied; to the extent that he considered this process of regulation lasted over the duration of the entire industrial cycle.

4.6. *A law of motion is not a static law*

Finally, how might such a law operate? Clearly, there cannot be any instantaneous correspondence between market prices and either values or prices of production, because supply does not equal demand. Consequently, a discrepancy produces a counter-tendency; if a market price stands above its corresponding price of production this will manifest itself as a surplus-profit, and will form a pole of attraction for capital. Conversely a lower market price will cause a lower than average profit and provoke an outflow. This much is obvious and recognised by all but there is a further obvious point that is not recognised by all: the process takes *time*. Factories cannot be assembled at will or dismantled on command. In cases of accelerated technical innovation (IT in the current phase, Steel and Electricity in the second Kontradieff, etc), a shortfall can last an entire epoch and can serve as a long-standing motor of motion.

The real task of economic analysis is to establish the *dynamic* laws of this motion. However, this cannot be done in purely nominal terms. If nominal money prices were the only factor affecting profits or investment behaviour, then the most rational economic course would be hyperinflation, creating giant nominal profits. The true laws of motion of the economy are not just governed by nominal prices. This is why a value concept is needed; this is why we must distinguish the nominal from ‘something else’ that underlies it. Neoclassical economics, however, unquestioningly and dogmatically supposes that there is only one possible measure of this ‘something else’ – an incoherent use-value measure derived from the assumption of an impossible perfection.

But there is a *better* measure of this ‘something else’ – Marx’s values. These relate directly to the most universal element of the productive process, the element that in fact defines what production consists of: labour. It provides a direct behavioural link to the basic process of wage-bargaining. It cuts the Gordian knot in the endless controversies between Keynesians and their rivals, as to whether workers bargain over real or nominal wages: what workers bargain over is *labour time*: the first question anyone asks when considering a salary is ‘how long must I work to obtain what I want’. It permits a clear distinction between increases in *output* – the greater utilisation of productive resources – increases in *productivity* – an increase in the use-value output resulting from the application of labour

– and *nominal* price increases – a merely inflationary increase in the price level, measured properly, not against the volume of use-values but against the labour content of the product.

Until now only one argument has been applied in economics to avoid confronting this practical, theoretically coherent and empirically meaningful alternative: that the author of this idea, Karl Marx, committed unsolvable logical errors which could not be recovered from.

We have shown that this provably false idea arises because Marx has been saddled with the very theoretical errors that give rise to the persistent failure of economics itself. It is time to consider Marx, the founder of modern political economy, in his own right and to accord his work the place it deserves.

Figure 4: randomised market prices and TSS prices of production

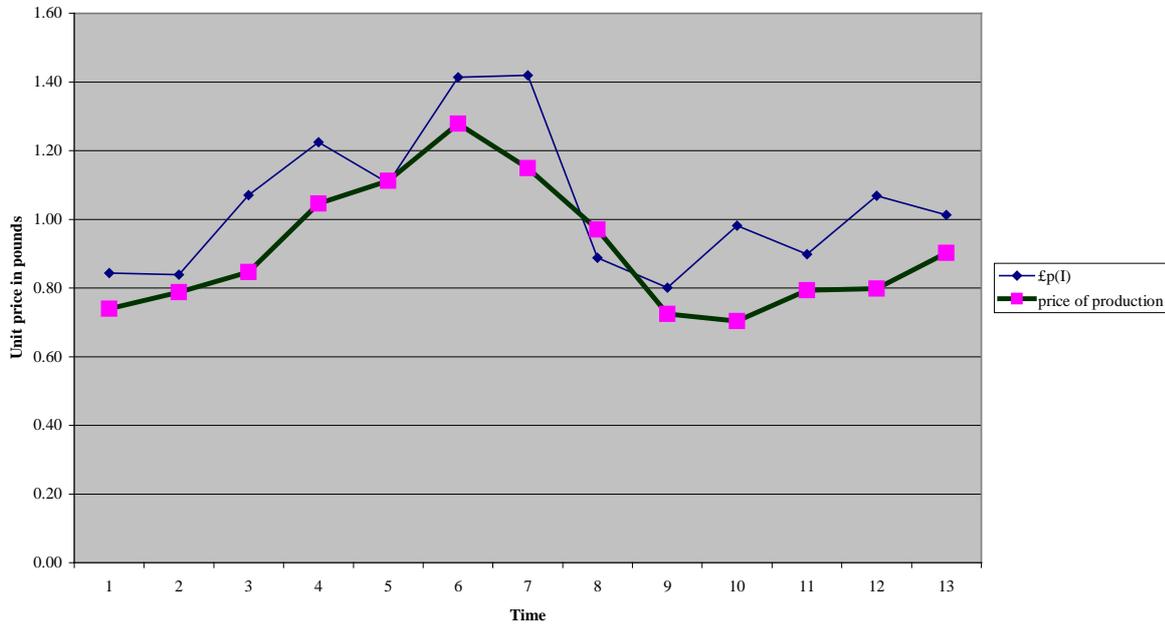
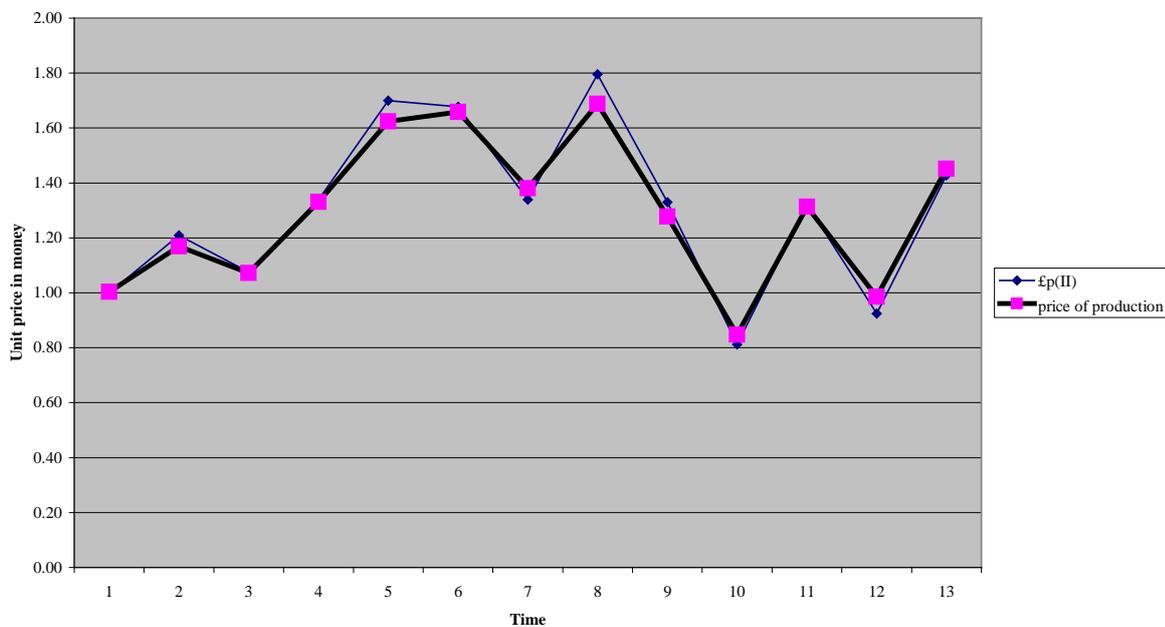


Figure 5: randomised market price and TSS price of production



APPENDICES

5. Appendix I: Interpretation versus hermeneutics

Before we can assess any author's ideas, we have to confirm that these ideas correspond to our understanding of them.²⁴ As indicated, the understanding of this paper is based on an interpretation of Marx: the *temporal single-system* or TSS interpretation of Marx's theory of value.²⁵

This should not be confused with *hermeneutics*, or trying to derive truth from texts. It stands apart from the dominant tradition of Marx-interpretation which we term *solipsism*, imposing the writer's meaning on Marx's words. Interpretations provide an essential function by supplying a meaning to the terms in a theory which are coherent with the intentions of its author. Both hermeneutic text-trading, and solipsistic refusals to consider the meaning of terms in a theory, reduce to the same dogmatic belief, that the only thing Marx could possibly have meant is what the writer thinks he meant.

Because this point is misunderstood, TSS writers are often accused of a dogmatic or scholastic approach, as for example in Foley (1999):

The TSS literature also has a curiously scholastic and obscurantist vision of theoretical practice, for example, the idea that a highly technical reinterpretation of the labor theory of value can unlock secret insights into the nature of capitalism hidden in Marx's text.

The problem is the exact opposite: it is to finish once and for all with the schismatic proliferation of scholastic dogmas based on interpretations of Marx, by insisting Marx speak for himself. Nothing could be more obscurantist or dogmatic than *existing* highly esoteric, highly technical and highly erroneous readings of Marx; to accept this without question is precisely to perpetuate it.

The issue is not just Marx but the way economics views truth. Its dominant method is to appeal to authority: to cite writers as if, because of their eminence, their views become evidence about the world. The usual treatment of Marx does not question the method of appeal to authority, but seeks instead to set up alternative sources of it, 'demonstrating' that Marx's theory cannot be completed on its own terms. Authors can then live under his mantle whilst promoting their own theories as a necessary improvement on his, and their own eminence as the originators of the improvement. This perfectly excuses the rest of academia, which defends its own dogma by systematically suppressing its most effective critic with a claim that his theory is logically flawed – applied, however, not to that theory, but to the interpretations of self-appointed disciples.

The solution is to distinguish once for all between the theory itself and its interpretations. To ensure *no-one* poses as Marx on earth, he has to be read in his own right, in the clear understanding that every writer in the last analysis speaks only for her or himself.

TSS is not a new orthodoxy; it spells the end to all orthodoxy. It is a specific interpretation of Marx's theory; it is not Marx's theory. The reader can only judge Marx's theory by reading, citing, and interpreting, Marx himself.

5.1. All readers interpret a theory; the point, however, is not to change it

Does this mean everyone is free to read, interpret or cite Marx as they choose? No: interpretations are unavoidable but we can judge between them. Even solipsists interpret: they just don't admit it. Rather than wish it away we should be conscious of interpretation, distinguish it from the original, and cease excluding the alternatives by ignoring the problem.

But what are the criteria for judging an interpretation? It does not reduce to finding scriptural quotations; we must ask whether the texts make sense, and whether the conclusions in them hang together or contradict each other, given the meaning we attach to them.

We can illustrate by considering Marx's famous 'first equality': "the sum of prices of production for the commodities produced in society as a whole – taking the totality of all branches of production – is equal to the sum of their values" (Marx 1981:P259)

From a Ricardian standpoint, value is a special kind of price, a ratio between use-values. For Marx, price is a form of value, a ratio between quantities of abstract labour embodied prior to exchange.

These two ideas assign a completely different meaning to the two key words in the citation. In a

²⁴ We refer extensively to Ricardian theory (that is, the theory of the Ricardian school as defined by Marx), without presenting much evidence that it was Ricardo's own view. This is because Marx himself offers this evidence. Of course, this is only an interpretation of Ricardo: Marx's. In this paper, 'Ricardian' is a shorthand for Marx's interpretation of Ricardo.

²⁵ See, for example, Freeman and Carchedi (1995)

Ricardian framework this appears as an arbitrary 'normalisation condition'. Why indeed should there be any special relation between the sum of one set of money prices and the sum of another set of money prices? But for Marx anything other than the first equality is nonsense: each and every set of possible prices is nothing other than a redistribution of the same total amount of pre-given social labour, the labour embodied in the commodities being priced.

One need only pose the question in this way to see that the reading of the same set of words depends entirely on the meaning assigned to them: that is, to the interpretation applied. But one may also use this to make a judgement on which is more likely: (1) after practically burying himself in the British Museum for a decade, Marx in desperation plucks a numéraire from the sky to make Ricardo's arithmetic work? Or (2) after a profound critique of political economy, he reconstructs the category of price from first principles, reducing all prices to claims on total social labour in circulation and revealing that their sum is a necessary invariant of circulation, because any set of prices simply constitutes a different division of the same aggregate?

We leave this judgement as an exercise for the reader.

6. Appendix II: textual evidence from Marx

6.1. Marx maintains his critique, which informs all his subsequent work

The passage that opened this paper occurs in a very early work of Marx on economics. Whilst its formulations are neither casual nor inexact, it must be shown that later sharpening of the distinctions between exchange value, value, and price do not sublate, contradict or overturn this initial statement, but merely elaborate and give it further determinations. It must be shown that Marx did not abandon them, and that they did not become inconsequential to his later work.

Indeed the same formulations occur repeatedly in his subsequent writings, and cannot be dismissed as an abandoned part of his early work, as the following show.

6.2. Critique of Proudhon, of Darimon, and of the time-chitters

Consider first his criticism of Proudhon in the *Poverty of Philosophy* (Marx 1978:61):

It is not the sale of a given product at the price of its cost of production that constitutes the 'proportional relation' of supply to demand, or the proportional quota of this product relatively to the sum total of production, it is the *variations in supply and demand* that show the producer what amount of a given commodity he must produce in order to receive in exchange at least the cost of production. And as these variations are continually occurring, there is also a continual movement of withdrawal and application of capital in the different branches of industry...if M. Proudhon admits that the value of products is determined by labour time, he should equally admit that it is the fluctuating movement alone that makes labour the measure of value.

This criticism, to which I will return – and which, we should not forget, appears in a published work of Marx and hence in a form which he considered valid for public consumption, and certainly never repudiated – is not merely taken over into the *Grundrisse* (cited above in section 0000) in the critique of Darimon and the time-chitters but is specifically referenced there:

Market value equates itself with real value by means of its constant oscillations, never by means of an equation with real value as if the latter were a third party, but rather by means of a constant non-equation of itself (as Hegel would say, not by way of abstract identity, but by constant negation of the negation, i.e. of itself as negation of real value). In my pamphlet against Proudhon I showed that real value itself – independently of its rule over the oscillations of the market price (seen apart from its role as the *law* of these oscillations) – in turn negates itself and constantly posits the real value of commodities in contradiction with its own character, that it constantly depreciates or appreciates the real value of already produced commodities... *Price* therefore is distinguished from *value* not only as the nominal from the real; not only by way of the denomination in gold and silver, but because the latter appears as the law of motions which the former runs through. But the two are constantly different and never balance out, or balance only coincidentally and exceptionally. The price of a commodity constantly stands above or below the value of the commodity, and the value of the commodity itself exists only in this up-and-down movement of commodity prices. Supply and demand constantly determine the prices of commodities; never balance, or only coincidentally; but the cost of production, for its part, determines the oscillations of supply and demand... On the assumption that the production costs of a commodity and the production costs of gold and silver remain constant, the rise or fall of its market price means nothing more than that a commodity, = x labour time, constantly commands $>$ or $<$ x labour time on the market, that it stands above or beneath its average value as determined by labour time.

6.3. Value and equilibrium in Marx's mature work

The formulations concerning the non-equilibration of supply and demand, recapitulating much of Marx's polemic against Proudhon almost identically, is explicit in Volume I of *Capital*, which Marx himself prepared for publication:

While within the workshop, the iron law of proportionality subjects definite numbers of workmen to definite functions, in the society outside the workshop, chance and caprice have full play in distributing the producers and their means of production among the various branches of industry. The different spheres of production, it is true, constantly tend to an equilibrium: for, on the one hand, while each producer of a commodity is bound to produce a use-value, to satisfy a particular social want, and while the extent of these wants differs quantitatively, still there exists an inner relation which settles their proportions into a regular system, and that system one of spontaneous growth; and, on the other hand, the law of the value of commodities ultimately determines how much of its disposable working-time society can expend on each particular class of commodities. But this constant tendency to equilibrium, of the various spheres of production, is exercised *only in the shape of a reaction against the constant upsetting of this equilibrium*. Chapter 14, my emphasis.

A further interest of this passage is that it is one of the very few in which Marx employs the word 'equilibrium' at all. At least in passing this raises the question: if he was an equilibrium theorist, why does the word appear so infrequently in his works, especially since when he chooses, he employs it with the meaning of modern economics? But second, he is at great pains to explain that the real motion consists not of an actually-established equilibrium but of a tendency towards it, which is 'exercised only in the shape of a reaction against its constant upsetting'; that is, it is only because the equilibrium does not occur, that the tendency manifests itself – which means, in turn, that the tendency to equilibrium manifests itself as a motion, not as an established fact.

6.4. Price of production: a non-equilibrium concept

Nor is this law a 'Volume I concept', a problem resolved with the full Volume III treatment of price of production. Marx does not raise the departure of price from values in Volume I, in order to dismiss the problem in Volume III by substituting static prices of production for static values. This popular conception is a travesty of all his actual writings on the subject. On the contrary, formulations virtually identical to his initial critique of Mill end up as the central core of the vital chapter IX of *Capital* which discusses how prices of production are formed (Marx 1981:291):

The real inner laws of capitalist production clearly cannot be explained in terms of the interaction of demand and supply ... since these laws are realized in their pure form only when demand and supply cease to operate, i.e. when they coincide. In actual fact, demand and supply never coincide, or, if they do so, it is only by chance and not to be taken into account for scientific purposes; it should be considered as not having happened. Why then does political economy assume that they do coincide? In order to treat the phenomena it deals with in their law-like form, the form that corresponds to their concept, i.e. to consider them independently of the appearance produced by the movement of demand and supply. And in addition, in order to discover the real tendency of their movement and to define it to a certain extent. For the disproportions are contrary in character and, since they constantly follow one another, they balance each other out in their movement in contrary directions, their contradiction. Thus if there is no single individual case in which demand and supply actually do coincide, their disproportions still work out in the following way – and the result of a divergence in one direction is to call forth a divergence in the opposite direction – that supply and demand always coincide if a greater or lesser period of time is taken as a whole; but they coincide *only as the average of the movement that has taken place and through the constant movement of their contradiction*. [my emphasis]

This passage also introduces more centrally an idea which we noted in earlier passages referring to the 'law of motions which value runs through'. It recurs systematically in Marx's discussion of the law of value but is hardly ever, if at all, investigated by the several authors who seek to verify empirically the relation between values and prices. This is the idea that the empirical relation between value and price asserts itself *over time*.²⁶ Supply and demand coincide over a 'greater or lesser period of time' but 'only as the average of the movement'.

This is in a certain sense obvious; anyone who can add up has to concede that a *continuous* excess of supply over demand would result in a permanent accumulation of unsold goods, and it is not disputed by Marx that such an accumulation would bring about a movement in prices leading to its reduction. However, it is a very different matter to assert that an average is formed through divergence, and to assert that this average is what actually happens. The average teenager is 5ft high but there are very

²⁶ Giussani (1995) has produced an interesting discussion of this question including a simulation demonstrating the point.

relatively few 5ft teenagers, and they don't tend to stay that size. The average position of a planet is in the middle of the sun, but this is not where we find any actual planet.

The comparative static dogma, to which I shall return, consists in essence in the unsupported and false assertion that a system in movement behaves as if the averages of its motion actually occurred at every instant in time or, to put it another way, that the entire motion of the totality can be accounted for by treating it identical to its average. This is a surprisingly and indeed shockingly rudimentary mathematical error, and a salutary demonstration of the power which an ideological delusion can exert over the conduct of even the most brilliant and otherwise scientific people, when this delusion arises from material circumstance and connects with private interest. Of this, more later.

Finally it is worth noting that Marx's insistence on the non-coincidence of demand and supply is the foundation of his discussion of crisis and his devastating criticism of Say's Law:

Nothing can be more childish than the dogma, that because every sale is a purchase, and every purchase a sale, therefore the circulation of commodities necessarily implies an equilibrium of sales and purchases. If this means that the number of actual sales is equal to the number of purchases, it is mere tautology. But its real purport is to prove that every seller brings his buyer to market with him. Nothing of the kind... no one is forthwith bound to purchase, because he has just sold. Circulation bursts through all restrictions as to time, place, and individuals, imposed by direct barter, and this it effects by splitting up, into the antithesis of a sale and a purchase, the direct identity that in barter does exist between the alienation of one's own and the acquisition of some other man's product. To say that these two independent and antithetical acts have an intrinsic unity, are essentially one, is the same as to say that this intrinsic oneness expresses itself in an external antithesis. If the interval in time between the two complementary phases of the complete metamorphosis of a commodity become too great, if the split between the sale and the purchase become too pronounced, the intimate connexion between them, their oneness, asserts itself by producing – a crisis. [25]

The imbalance between demand and supply is necessarily expressed, we again note, *in time*: if supply is unmatched by demand it means that someone has sold but has not purchased at the same *time*.

6.5. Marx on necessary labour time

1979:318

7. Appendix III: Marx's transformation procedure

The academic presentation of Marx as a general equilibrium theorist begins with Sweezy (1970:53) who writes, in a formulation virtually unchallenged by Marxists since that time, that

The law of value is essentially a theory of general equilibrium developed in the first instance with reference to simple commodity production

The critics of Marx, most Marxists, and the post-Sraffians, have developed the dogmatic proposition that Marx's value-concept is comparative static into the following two assertions, or their logical equivalents:²⁷

- (1) the value of any good is the price at which it would have to exchange in a hypothetical static economy with no profits, in order to equalise supply to demand in all sectors
- (2) the price of production of any good is the price at which it would have to exchange in a hypothetical static economy with an equal profit rate, in order to equalise supply to demand in all sectors.

There are many equivalent formulations. The clearest is the idea which Sweezy presents above: value is the price which obtains under a historically prior stage of capitalist development in which goods actually sell at their values free from the distracting influence of capital movements. Chris Arthur (1996) convincingly demonstrates that this originates with Engels and not Marx.²⁸ There is scant evidence in support of it in Marx's own writings, and almost every phrase of Volume I contradicts it. Another common idea, which also appears to originate with Sweezy and is almost universal in Marxist pedagogy, is that the progression from Volume I to Volume III consists of a progression from value to price by means of 'successive approximations' or 'successive levels of abstraction' of which system (1) is the first stage. A third notion, originating with the post-Sraffians, is

²⁷ This notion is what TSS researchers have designated the 'two system' or 'dualist' approach. The term 'temporal single system' arises because these researchers reject the idea that prices and values are determined in two distinct systems and argue instead that prices and values determine each other in *succession*, in a single system. See Kliman and McGlone (1988,1995) for the term 'two system' and Ramos and Rodriguez (1995) and Rodriguez (1995) for the term 'dualist'.

²⁸ Hence the interested reader can refer to Arthur for the evidence, which is not repeated here.

that Volume I presents a ‘pure labour’ economy with zero profits.

Mathematically, all these ideas are the same and reduce to Sweezy’s honestly blunt, but false, statement. According to this dogma, the *transformation problem* consists in the fact that values defined by (1) cannot be transformed into prices as defined by (2) without violating one or other of Marx’s ‘equalities’.

7.1. Where, and why, does Marx suppose price=value?

Let us first assess assertion (1).

The most elementary task confronting any reader who seeks to focus, even temporarily, on what Marx actually wrote, is to disabuse oneself of any notion that Marx presupposes, in Volume I, that goods exchange at values. In particular this presupposition does not appear at any point in the first five chapters of Volume I, in which the category of value is actually developed. There is no evidence for it; there is no suggestion in Marx that this was his intention; the idea is a pure fiction, which has grown over the course of the century into an almost unchallengeable article of faith. It receives support from the texts only if one reads them with the prior conviction that no other reading is possible.

The simplifying assumption that value=price appears in Volume I at the end of Chapter 5, after all the substantive categories of value, price and money have been developed. Its function at this point, where it is perfectly explicit, is not to study value but to study surplus-value. Its use is fully justified by the lengthy discussion, in chapter 5, of the effect of all possible kinds of deviation between price and value, and a scientific demonstration that none of these variations can affect the magnitude of surplus value. It is not, therefore, in any sense a part of the definition of value and moreover, it is absolutely inessential to the development of the category of surplus-value itself. It is a simplification *tout court*; a completely expendable supposition made in order to make the exposition easier.

Moreover the omission of value-price equality from the first five chapters is not an accident but is clearly part of a perfectly conscious decision. Whenever and wherever Marx supposes that values are equal to prices, he explicitly states it with great care, as he does with all his assumptions. In Volume I this assertion is found in the footnote at the end of chapter 5 ‘Contradictions in the general formula’, and restated and its position in the work makes it clear what its function is, namely, to examine a specific problem exhaustively treated in chapter 5: to identify the origin of surplus-value – not the nature of value itself.

Marx quite explicitly treats the deviation of price from value in completely general terms, in Chapter 3 of Volume I, and it is at this point, not in Volume III, that the necessity of transformation from value into price is raised, as our citation in section 2.3 makes clear.

The fact that price-value deviations are explicitly and coherently assessed cannot be dismissed as a fanciful aberration or slip of the pen. Volume I was the most worked-over and carefully considered of all Marx’s mature works. If Marx’s intention was that, throughout Volume I, there should be a ruling assumption that price=value, then it would have been inconceivable to leave such passages (let alone chapter 5 itself) in the place we find them.

This is important in relation to the following fact, confusing to the reader who enters Volume I with the fixed preconception that it assumes price=value. Of course, at many points Marx offers illustrations – for example of the effect of changes in the magnitude of value – in which the argument supposes price=value. This is particularly so when he is considering the impact upon prices of a change in values, and necessarily so, since he needs in that case to distinguish clearly between the effects of supply and demand and the effects of changes in value as such. This is very different, however, from a *ruling assumption* that price=value, or that supply and demand must necessarily be equal. It constitutes no more than a partitioning of the impact of change into two parts, one being the change in value which is studied, the other being the impact of the market on prices, which can be temporarily set aside.

Any non-equilibrium theorist, considering the general case of all possible market prices, is perfectly at liberty for the purposes of illustration to consider one particular set of market prices, namely exchange at values. Equilibrium is a special case of non-equilibrium, not *vice versa*. When a physicist studies the pendulum, s/he or he can and does consider the special case where it is not moving and even integrates this into the equations of motion of the pendulum. This is entirely different, however, from beginning with the assumption that the pendulum is at rest, and attempting to deduce its motion from this

supposition.

The decisive issue is the following for any such illustration: does it *logically presuppose* that price=value? In the case of Marx's derivation of value as such it must also be asked whether the subsequent development of the value concept, when prices of production are introduced, contradicts or merely further determines the derivation.

This is precisely why in Volume I Marx, very carefully, avoids introducing the surreptitious presupposition that price=value, when he is deriving the category of value. This is his decisive departure from Ricardo: it is why Samuelson's 'eraser' accusation applies to the Ricardian presentation of Marx's transformation (which does derive value by supposing price=value) but not to Marx's own transformation (which does not derive value by supposing that price=value).

Marx develops the conclusion that abstract labour is the substance of value not by considering the quantitative fact of the actual rates at which goods exchange, but the qualitative fact that they exchange at all. This is why the qualitative/quantitative distinction is so essential. No special quantitative assumption is involved, and that is why Marx feels completely free to depart from the special case in the earlier (p161) passage above. All the points to which I have previously drawn attention are recapitulated in this passage:

- (1) Value is given *independent* of the relations between demand and supply, of the 'circumstances which allow the price to be raised or compel it to be reduced'. This is because 'the same amount of social labour-time must be expended on the reproduction of a quarter of wheat both before and after the change in price'; it receives this value in production, independent of circulation and the magnitude of this value 'expresses a necessary relation to social labour-time which is inherent in the process by which its value is created.'
- (2) Price is itself the exponent of a magnitude of labour time. £2 *represents* 'a quantity of socially necessary labour'. Price is a *form of value*; value is not a special price.
- (3) We again find that the price-value relation is asserted by laws, and that these laws assert themselves as *averages over time*, a point which Marx repeats and to which I shall return.

In addition to all these points, we find the first definitive use of the word 'transformation'. The notion that Marx's transformation of values into prices is confined to Volume III does not itself come from Marx, whose sub-title for this volume was "The Process of Capitalist Production as a Whole". It comes from Volume I where the issue is clearly raised and, we will argue, in essence solved. The function of Volume III is not to present Marx's transformation procedure like a rabbit from a hat, and then shut up shop and go home. It is to *concretise* a conception that already exists in abstract form in Volume I, given the extra determinations that follow from supposing fully-developed capitalism.

7.2. Marx's volume 1 transformation procedure

Chapter V of *Capital Volume I*, entitled 'Contradictions in the General Formula' is devoted to assessing, systematically, whether value may be increased or decreased in circulation. Its purpose is to examine where surplus value comes from. It is thus a discussion of pure circulation:

Let us take the process of circulation in a form in which it presents itself to us as the exchange of commodities pure and simple (1979:259)

It ends with the famous '*Hic Rhodus, hic Salta*' passage that begins:

We have shown that surplus-value cannot arise from circulation, and therefore that, for it to be formed, something must take place in the background which is not visible in circulation itself...Capital cannot therefore arise from circulation, and it is equally impossible for it to arise apart from circulation. It must have its origin both in circulation and not in circulation.

We therefore have a double result.

The transformation of money into capital has to be developed on the basis of the immanent laws of the exchange of commodities, in such a way that the starting-point is the exchange of equivalents. The money-owner, who is as yet only a capitalist in larval form, must buy his commodities at their value, sell them at their value, and yet at the end of the process withdraw more value from circulation than he threw into it at the beginning. (1979:268-9)

A footnote to this passage again clarifies the reasons for supposing exchange at values from this point on, quite unambiguously:

The reader will see from the foregoing discussion that the meaning of this statement is only as follows: the

formation of capital must be possible even though the price and the value of the commodity be the same, for it cannot be explained by referring to any divergence between price and value. If prices actually differ from values, we must first reduce the former to the latter, i.e. disregard this situation as an accidental one in order to observe the phenomenon of the formation of capital on the basis of the exchange of commodities in its purity, and to prevent our observations from being interfered with by disturbing incidental circumstances.(1979:269nn)

The rest of this interesting footnote recapitulates the exact same points already made in our initial selection of citations. Here, we want to point out the following:

- (1) as indicated, price=value is supposed at *this* point; that is, this was not the ruling supposition until now, or there would be no need to state it now
- (2) the reason for making the supposition that price-value now is to study the formation of *surplus-value*, given that the category of value has already been established *without* previously supposing price=value, that is, totally generally.
- (3) Marx further clarifies the circumstances under which we may treat price-value deviations as ‘incidental’: not because they are in general ignorable but because they cannot affect the issue under discussion. We can ignore them because Marx considers that he has just proven that price-value deviations, of any kind, cannot modify the size of surplus-value

But this last point is simply Marx’s infamous ‘second equality’ in its abstract form, applied here not only to prices of production but to *all* market prices. Prices of production are not an addition to this basic idea but a concretisation of it; an application of this general thesis to the particular case where the profit rate tends to equalise.

Moreover, the same statement necessarily implies Marx’s first equality. To see this, we must understand the two equalities as they appear in Volume III as a concretisation of the following, more general statements:

- (1) the magnitude of value is an invariant of circulation
- (2) the magnitude of surplus-value is an invariant of circulation

The term ‘invariant’ here means that no possible re-arrangement of prices can bring about a variation in the total magnitude of value. To put this another way, the magnitude of value cannot be altered in circulation. This is a more general statement than that found in Volume III, which merely specifies the equality between two specific sets of prices, namely values and prices of production. The second equality is not really a ‘second equality’ at all; it appears so only to the mind of a Ricardian for whom the first equality is in any case a mysterious and arbitrary normalisation condition. As we have stated above, it simply asserts that extra value cannot arise in circulation. The ‘first’ and the ‘second’ equality or thus two ways of saying the same thing: one says the magnitude of value is constant and the other says no extra value can arise: in mathematical symbols the first says

$$\Sigma P = \text{constant in circulation}$$

the other says

$$\Delta \Sigma P = 0 \text{ in circulation}$$

This is like the difference between saying that all points at sea level are equidistant from the earth’s centre, and saying that one does not need to sail uphill. It is the same statement. The statement ‘sum of prices of production = sum of values’ is then like saying that Ellis island is the same distance from the earth’s centre as Alcatraz.

In Volume III, Marx establishes the second equality in the shape of a formal deduction. This is necessary, because the category of surplus-value has now been fully developed and shown to originate in the sale and purchase of the commodity labour-power. The earlier Volume I transformation must therefore be further concretised, and it must be demonstrated that this concretisation does not overturn the original more abstract argument but sublates it, in normal dialectical fashion.

But it follows that the Volume I transformation is, first of all, the abstract origin of the Volume III transformation and, second, it is not contradicted by the Volume III transformation. The equalities are *already present abstractly in Volume I*; they are not introduced out of the blue in Volume III but presented in a more concrete form, specifically restricted to fully-developed capitalism.

The deduction of these equalities follows almost axiomatically from the concept of circulation itself. The very idea of circulation implies merely a change in the ownership of that which already exists. That is, it excludes production. Likewise, although perhaps less obviously, it excludes consumption. Therefore what happens in circulation is that a pre-existing totality of value is ‘moved around’ or redistributed between economic agents, and this cannot be decreased or increased in the process.

The analysis proceeds as follows. First Marx does consider the exchange of equivalents. This he must do in order to distinguish between an increase in use-value (which, shades of marginalism, *can* occur in circulation, by transferring a product from one person that has no use for it, to another who has). The careful formulation traces what is now hopefully familiar ground:

The vulgar economists have practically no inkling of the nature of value; hence, whenever they wish to consider the phenomenon in its purity, after their fashion, they assume that supply and demand are equal, i.e. that they cease to have any effect at all. If, then, as regards the use-values exchanged, both buyer and seller may possibly gain something, this is not the case as regards exchange-value. (1979:261)

Next, Marx enquires whether exchange of *non-equivalents* can increase value:

If commodities, or commodities and money, of equal exchange-value, and consequently equivalents, are exchanged, it is plain that no one abstracts more value from circulation than he throws into it. The formation of surplus-value does not take place. In its pure form, the circulation necessitates the exchange of equivalents, *but in reality processes do not take place in their pure form. Let us therefore assume an exchange of non-equivalents.* (1979:262, my emphasis)

In an exchange of equivalents, each draws out what she puts in, and neither the distribution or the sum of value can change. In an exchange of non-equivalents, however, it is possible for *one* individual or group of individuals to gain what *another* individual or group lose. This gives rise to the illusion that a surplus can arise from trade. But it is an illusion, because the sum of losses and gains must equal zero, given that the process has merely redistributed the same initial mass.

Marx first considers a nominal increase in price:

Suppose, then, that some inexplicable privilege allows the seller to sell his commodities above their value, to sell what is worth 100 for 110, therefore with a nominal price increase of 10 per cent. In that case the seller pockets a surplus-value of 10. But after he has sold he becomes a buyer. A third owner of commodities now comes to him as seller, and he too, for his part, enjoys the privilege of selling his commodities 10 per cent too dear. Our friend gained 10 as a seller only to lose it again as a buyer. In fact the net result is that all owners of commodities sell their goods to each other at 10 per cent above their value, which is exactly the same as if they sold them at their true value.

Having established that a nominal price increase cannot augment value, Marx then considers changes in relative price:

A may be clever enough to get the advantage of B and C without their being able to take their revenge. A sells wine worth £40 to B, and obtains from him in exchange corn to the value of £50. A has converted his £40 into £50, had made more money out of less, and has transformed his commodities into capital. Let us examine this a little more closely. Before the exchange we had £40 of wine in the hands of A, and £50 worth of corn in those of B, a total value of £90. After the exchange we still have the same total value of £90. The value in circulation has not increased by one iota; all that has changed is its distribution between A and B. What appears on one side as a loss of value appears on the other side as surplus-value; what appears on one side as a minus appears on the other side as a plus. The same change would have taken place if A, without the disguise provided by the exchange, had directly stolen the £10 from B. The sum of values in circulation can clearly not be augmented by any change in their distribution...The capitalist class of a given country, taken as a whole, cannot defraud itself.

However much we twist and turn, the final conclusion remains the same. If equivalents are exchanged, no surplus-value results, and if non-equivalents are exchanged, we still have no surplus value. Circulation, or the exchange of commodities, creates no value (Marx 1979:266, my emphasis)

But this is exactly the 'first and second equality' in its fully general form. It asserts that the sum of the prices of goods in circulation, expressed as a sum of abstract labour, is an invariant of circulation, that is, cannot be augmented or diminished by a change in prices. It applies not just to prices of production, which are just one special case of the above, but to *arbitrary market prices*.

This has not been concretised as a determination of any specific set of prices because at this point in Marx's analysis, the labour-process as such has not been specified. Marx has not yet introduced the purchase and sale of the commodity labour-power, and has not even specified that production is capitalistic. This does not mean that production is in some sense 'pre-capitalist'; it simply means that until now Marx has dealt with the most general features of commodity production, common to all modes of production in which the commodity appears.

In consequence this transformation rule is *completely general* and applies to all market prices and all forms of commodity production. Far from failing to transform values into prices in volume I, Marx specifies the most general form of the transformation law, of which Volume III is but a specific concretisation which we will assess next.

7.3. *The use-value of money and the monetary equivalent of labour*

One last link is needed in order to assess Marx's Volume III transformation procedure, namely the connection between money and capital.

I earlier (section 4.3) referred to the *simultaneous single-system* approach of Moseley, Wolff-Callari-Roberts, and others. This body of work made a seminal contribution, completely ignored by the surplus approach school, in defending Marx's transformation procedure against the argument that Marx 'forgot to transform inputs'. The insight that they brought to the transformation question, which originates with earlier input from the 'New Solution' authors, is that capital is represented for Marx not by the value of the goods which are purchased by the capitalists, but by the value of the money which pays for them. The 'New Solution' applies this to variable capital only whereas single-system authors (both simultaneous and temporal) apply it also to constant capital.

Marx's two equalities are then immediately respected and the supposed 'error' in his transformation procedure does not exist.²⁹ However, two problems remain for the simultaneous variants of this approach. First, they require something that Marx does not specify: that input prices should be equal to output prices. If this was Marx's conception, why does he not furnish numerical examples in which it is the case? And to the extent that he does not, is von Bortkiewicz not justified at least to some extent in reproaching him with this fact, if it is a necessary assumption which Marx has overlooked?

Second, the supposition that Marx equates capital with money spent must be tied in with an overall interpretation of Marx's concept of money, or it takes on the appearance of yet another arbitrary numerical assumption to 'make the numbers work'.

Some very considerable work has been done on the second issue, the most outstanding in my view being Rodriguez(1996) But nevertheless it remains to connect up this special insight on transformation, with the more general and vibrant debate about money and Marx's concept of money, that is in progress today.

Establishing such a connection in all its ramifications is beyond my scope, but I do think it is necessary to show, in passing over to prices of production, that the single-system concept is not a particular feature of transformation but is a direct consequence of Marx's concept of money itself. Not least, this is because Marx's reproach against the Ricardians, with which we began, centres precisely on their neglect of the role of money in separating sale from purchase, and in mediating between independent private producers, leading to the necessary departure of price from value.

7.4. Where does Marx presuppose the equality of input and output prices?

The simultaneous single-system approach presents a strange puzzle in the history of thought. None of the authors in this tradition have anything to lose by generalising their approach to a temporal concept. Yet in over five years of debate, only one author (Ramos) has done so.

In the case of dualist authors, or even New Solution authors, I can understand that a major adjustment to past positions is needed to adopt TSS positions, and though this is something that every thinker must be prepared to do, it is genuinely intellectually difficult, not just because of the more venal fact that a record of publications and an academic status may be at stake, but because anyone who studies theory acquires a set of concepts and habits of thought which need to be re-cast as a whole when a new paradigm is adopted; this wholesale transition is difficult. This does not excuse a failure to rethink, since a paid intellectual is responsible not to her or himself but to the general public; it does help explain the phenomenon and is cause for sympathy.

But very little that has been written by SSS authors needs to be reconsidered, in order to re-cast their work in a temporal framework. TSS values are a straight generalisation of SSS values. The SSS contribution is a milestone on the road to the TSS position, which I openly acknowledge and will continue to do so. What objections are there, from SSS authors, to the TSS generalisation?

One possible argument, which I have heard only verbally, is that the SSS project only consisted in defending Marx's transformation procedure and that there is therefore no need to go any further. Its field of enquiry is limited and therefore, so is its method.

The principal objection which I have to this is that my aim is not just to defend Marx's transformation; this is only the starting point in a much more general project of defending Marx's entire value concept which, I think, is necessary simply because it is better than anything else around. It is a vastly superior concept to the whole of twentieth century economics, which operates as a kind of church of the market

²⁹ The reader is referred to the copious literature for verification under the interpretation of choice and for textual evidence – which can be found in abundance – in support of this assertion.

immaculate and, as a byproduct, as a kind of inquisitional machine for suppressing heretical alternatives, Marx's own theory being top of the list.

However even within the terms of the SSS protagonists, in the limited context of defending Marx's transformation, a major objection to confining oneself to the simultaneous case is the following: any unprejudiced reader can refer to Marx's own texts and see that Marx didn't do it that way. His transformation tables do *not* presuppose the equality of input and output prices and, therefore, if this supposition is necessary, then Marx was indeed in error, and the procedure which SSS authors suggest is not Marx's. This is a strange defence of Marx.

The great brunt of the twentieth century attack on Marx consists in the repeated and false accusation that Marx 'forgot to transform inputs'. It is not an adequate response to this accusation to say: 'it is true that Marx forgot, but the failure is easily corrected.' This is for two reasons: first, Marx did not forget to transform inputs, as we will now demonstrate, so that it is inconsistent, confusing and unnecessary to concede this point; but far more importantly, because the real function of these repeated accusations is not just to demand the transformation of inputs but to demand the equality of input and output prices. This is no less than a systematic (and successful) drive to foist the Ricardian method onto Marx: to make Marx into a 'minor post-Ricardian'. For all the reasons already given, this is a travesty. We therefore take strong issue with any attempt to go beyond the defend Marx's transformation procedure in a manner which actively assimilates Marx's value concept to that of Ricardo or the classicals in general.

One of the difficulties with much contemporary Marx interpretation is insufficient use of Occam's razor. If Marx intended that input prices should equal output prices, he would have said so. The most reasonable and simplest assumption is much more straightforward: it is that he did not consider it made any substantive difference what the capitalists paid for their inputs: that is, he did not consider that this could modify his substantive conclusion, that total surplus value was equal to total profit.

The question then to be asked is: *why* would he take such a view?

7.5. *Where does Marx say that inputs are purchased at their values?*

The only answer to the above question that makes sense is that he considered the transformation of inputs already to be implicit in the concept of capital. This in turn suggests that it is implicit in his conception of *money*.

It is here that an important point intrudes. Whereas Marx is always explicit in stating, at definite points in his work, when goods are presumed to sell at their values, he is *not* likewise explicit in stating that they are purchased at their values.

There is a difference. In Volume I Marx studies the 'process of capitalist production, taken by itself, i.e. the immediate production process.' (1981:118) Here, where Marx studies the circuit M-C-P...C'-M' he does *not* presuppose anything special about how the inputs were produced. Indeed, he quite often refers to cases in which they are produced non-capitalistically, for example in ancient or Roman society. This is logically perfectly correct. He does not presuppose that capitalism exists as a self-sustaining mode of production but *proves* that it can do so in Volume II by demonstrating how the capitalist production process, studied in Volume I, is actually capable of creating the basis for its own existence by reproducing its own initial conditions, allocating to private and un-coordinated producers the use- and exchange-values that they require to recommence production.

The supposition that inputs are *purchased* at their values is therefore not introduced until Volume II (where it is very explicit) and is confined to that volume: that is, it does not a ruling assumption in Volume III. It is true that Marx's illustrations of the procedure make this assumption – just as in the first part of Volume I, illustrations are to be found where goods are sold at their values, without making this into the ruling general assumption.

Indeed, this is contradicted by the very words he uses: Volume III opens with the category of 'cost-price' – not cost-value; that is, what it costs the capitalist in money to acquire her or his inputs. The ruling supposition is that the capitalist acquires inputs for money under general market conditions. The value of capital, in these circumstances, will be different depending on whether one considers the value of the commodities that make up these inputs, or the value represented by the *money itself*. The value of this money itself, then, is what we strongly believe Marx means when he speaks of the value of capital.

We should not forget that it is supposed throughout his work, in fact from the very beginning of Volume I, that the capitalists acquire their inputs for money on the market. We should also not forget that Marx consistently treats money as the representative of abstract social labour, and indeed insists on this point against Ricardo, as we have seen. We already seen this (section 2.1) in (Marx 1972:137)

The whole matter turns on what meaning we should assign to the ‘value of capital’ since it is the capital, the money-form, with which the circuit begins. The dominant assumption is that the value of capital means the value of the goods that the money purchases. But the *simplest* and most *coherent* interpretation is to suppose that in purchasing their inputs for money, the capitalists have *already* given their capital the form of general social labour through the vehicle of money, and that the value of these inputs as such is irrelevant to the labour-process. From this point of view, if I spend £200 in money on some iron, and if this £200 *itself* represents 200 hours, then my capital is 200 hours whether the iron itself represents 100 hours or 300. If I pay over the odds for the iron, the value transfer that this represents is already accounted for in the act of purchase. It cannot again be accounted for in the act of consumption. I was robbed when I bought the iron, not when I used it. Or to be more precise, if its price *sinks* while it is in my possession, so that I am obliged by competition to sell my products cheaper when I use it, then I was robbed not by the act of using the iron, but by the fact that I let it stand still long enough for the market to take away its value, before I used it. Again, it is the preceding phase of circulation which transfers the value between the owners of inputs, not the labour-process which uses them.

From this standpoint, Marx’s idea not only in Volume I but throughout *Capital* is that the value of capital is *always*, for the capitalist, given by the monetary representation of that capital. In that case, the analysis does not need to be altered if this monetary representation – the price of the goods making up the capital – changes in circulation. The value transferred to the product would then *always* be the market price of the consumed elements, and if this differs from the value of these elements, it would be the former rather than the latter which would determine the value transferred to the product.

This also offers a much more reasonable and simpler explanation of those famous passages in which Marx acknowledges cost-price may diverge from value. The literature, perversely, interprets these as meaning that he knew he had a problem but chose not to deal with it. Again, Occam’s razor has been insufficiently applied in reading these texts. In the absence of strong evidence to the contrary, we have to assume that a writer means what he or she says. What does Marx actually say?

[T]he cost price of a commodity, in which the price of production of other commodities is involved, can also stand above or below the portion of its total value that is formed by the value of the means of production going into it. It is necessary to bear in mind this modified significance of the cost price, and therefore to bear in mind too that if the cost price of a commodity is equated with the value of the means of production used up in producing it, it is always possible to go wrong. Our present investigation does not require us to go into further detail on this point. (1981:265)

Why not suppose that when Marx ‘Our present investigation does not require us to go into it in further detail.’ he means ‘Our investigation does not require us to go into it in further detail’ rather than ‘oops, this is actually very difficult but I don’t have an answer right now’?

The question then becomes: what interpretation makes *sense* of the view that the investigation does not require any more attention? And the obvious answer is: that the value of capital is in general given, for Marx, as the value represented by its monetary form, and it is therefore secondary or irrelevant whether the constituent elements of this money sum stand above or below their value.

Textual support for this idea has been very substantially documented in the literature (see for example Freeman and Carchedi (1996)). The passage we cited in section (000) makes this explicit and we repeat the vital section:

The present argument is just as valid if prices rise or fall not as a result of fluctuations in value, but rather as a result of the intervention of the credit system, competition, etc.

Since the rate of profit is equal to the proportionate excess in the value of the product over the value of the total capital advanced, an increase in the rate of profit that arose from a devaluation of the capital advanced would involve a loss in capital value. (1981:208)

This is completely explicit: both the value of consumed capital, and the denominator of the rate of profit, are given by the *market price of its elements*; that is, by the value represented by their money worth.

This greatly clarifies Marx’s Volume I reference to the same phenomenon:

The definition of constant capital given above by no means excludes the possibility of a change of value in its elements. Suppose that the price of cotton is one day sixpence a pound, and the next day, as a result of a failure of the cotton crop, a shilling a pound. Each pound of the cotton bought at sixpence, and worked up after the rise in value, transfers to the product a value of one shilling. (Marx 1979:319)

It is true that in the same paragraph later on Marx explains that this change in price could be the consequence of a change in value, since a harvest failure means that more labour is required to produce the same amount of cotton. But he says this in order to make a specific point: that the change in the value of the yarn originates outside of the valorisation process. Here, as in many other places, he uses price and value quite interchangeably to talk about the value of capital, and when he revisits the question in Volume III he is absolutely explicit that the change does not have to arise from a change in the value of the constituent elements of capital.

7.6. Marx's Volume III transformation

What did Marx transform? 'General' versus Hypothetically Equal profit rates

One of the most universal propositions of neoclassical and post-Sraffian dogma alike is the proposition that profit rates in all sectors of the economy are everywhere actually equal. This proposition plays a clear ideological role: in reproducing the prejudices of vulgar economics it permits neoclassical economics to speak of 'the' price of capital as being this uniform profit rate, treat capital into a 'factor of production' whose contribution to the price of the product is given by this price, and explain profit in Smith's 'adding up' formula as the sum of the costs of the three factors of production – Marx's 'holy trinity' of wages, capital, and land.

This conception also traces its descent to Ricardo for whom profit was an actually equalised return on capital, and who expressed the contradiction between this and value by asserting that a commodity could not have 'two prices': two capitals could not have different returns.

Marx did not share this dogma; in consequence he nowhere asserts that profit rates actually equalise and quite the contrary, is at great pains to refer to it as the 'average' or 'general' profit rate and as an *ideal* that exists only in the heads of the capitalists.³⁰

Between the spheres more or less approximating the average there is again a tendency towards equalisation, seeking the ideal average, i.e. an average *that does not really exist*. (Marx 1981:173, my emphasis)

This distinction is indispensable for at least three of his objectives, without which his dynamic analysis is wrecked beyond repair.

- (a) he has to explain the *motion* of capital; that is, he has to explain what causes capital to migrate from one sector and process of production to another sector and process of production. This motion ceases to exist if profits actually equalise; there is no reason for capital to move. The actual motor force of capitalist development is the pursuit of *superprofit* or *surplus profit*; a profit above the average resulting from either a monopoly advantage or an advance in productivity.
- (b) he has to explain *rent* and consequently the price of the produce of the land; this requires that the profit on both agricultural and mineral production where differential rent is obtained is *higher* than the average. Nor is this a minor matter, since agricultural goods are always the point of departure for means of consumption, and minerals the point of departure for means of production. Virtually everything in capitalists society contains an integrated input from a sector where the rate of profit is not equal to the average.
- (c) he has to explain the *rate of interest and profits on banking capital*, which as a portion of general profit is *always necessarily less* than the general rate of profit. Money capital does not, and cannot for any significant length of time, attract the average profit rate or industrial production would cease

Why, then, does he require the category at all? Because as a *mental* category, which enters the consciousness of the capitalists (but does not govern actual exchange) it determines, first of all the return on commercial capital, second the upper limit of the return on money capital, and thirdly the bottom limit of the return on land.

³⁰ It is precisely because prices of production are ideal, that no claim is made that they function as actual prices. For Marx this is not a problem and indeed he systematically polemicalises against the idea, because of his clear distinction between market price and price of production, and because of his concept of law.

From this it follows that there is no requirement in Marx for prices actually to attain prices of production and it would make nonsense of his Volume III project to suppose that they do.

It is nevertheless reasonably clear that Marx conceived of prices of production as a *regulator* of market prices, in the precise sense of an *average over time* of actual market prices: to be precise, over the period of the cycle:

TBA

7.7. *The time period of the transformation*

The transformation does not take place in time: it is a phenomenon of circulation. Prices of production are always instantaneously defined.

8. **Appendix IV: on stationarity**

The modern equilibrium concept of comparative statics has developed since Ricardo. In particular, a number of distinct variant postulates can be found which are mathematically equivalent to asserting the equality of demand and supply; this mathematical equivalence is not always obvious and is sometimes denied. Throughout my own work, I use the word 'equilibrium' to signify *all* of the following, because I consider them mathematically equivalent:

- (1) supply equals demand in each period
- (2) prices are stationary (input prices equal output prices)
- (3) the proportions of the economy do not change, although its scale may (proportionate growth or a 'von Neumann ray')

I have not as yet supplied a complete demonstration that this is so. In outline, I now do so

8.1. *Essence of the argument*

Definition: property matrix

A property matrix is a matrix of commodity ownership organised by category of use-value and by owner. We suppose that there are at least as many owners (n) as there are types of use-value (m). A property matrix then has rank at most equal to m , and we will suppose henceforth that it is exactly equal to m , since this is the general case. As an example consider Marx's Volume I example of two producers, of wine and corn, each possessing 50 units of their own product.

Before exchange the matrix of capitals in use-value terms is

50 0

0 50

If they simply exchange on the market (at prices not yet specified) then after exchange the matrix is

0 50

50 0

Definition: exchange matrix

An exchange matrix is a matrix of commodity transfers in which commodities are neither created nor destroyed but may move from one capital to another. As an example consider two producers, of wine and corn, each possessing 50 units of their own product, and who exchange so that the wine-owner takes possession of the corn, and the corn-owner takes possession of the wine.

The exchange matrix may be considered as the difference of two property matrices, in our above example

-50 50

50 -50

An exchange matrix in general has rank $m-1$ because the marginal column totals must be zero (no

creation or destruction of use-values)

Exchange-Value ownership vector

Any set of prices, measured in abstract labour, assigns to the owners of property matrix a set of monetary worths. Thus suppose that corn costs £10 and wine also £10. The exchange-value vector is

$$10 \quad 50 \quad 0 \quad = 500$$

$$10 \quad 0 \quad 50 \quad = 500$$

Now suppose the price of wine rises to 20 and the price of corn sinks to 5. We then have

$$20 \quad 50 \quad 0 \quad = 1000$$

$$5 \quad 0 \quad 50 \quad = 250$$

Price fluctuations thus raise and lower the monetary worth of the stocks of goods held by the various members of society.³¹

Compatible exchange

Suppose that, in circulation, it is required that certain definite quantities of goods are transferred to the hands of the agents in the economy. We suppose that these quantities are *completely* specified, that is, in addition to the requirements of material reproduction in the production process, the goods destined for private consumption in each sector are also specified.

A compatible exchange is a pair $[p, E]$ where p is a price vector and E an exchange matrix specified as above, such that

$$pE = 0$$

In compatible exchange, *no agent loses or gains money*; the income of each agent from sales is exactly sufficient for their purchases. The exchange-value vector of a compatible exchange is thus 0.

Lemma: an exchange matrix is in general compatible with one, and only one, price vector, to within a numéraire.

Compatible exchange means a set of prices such that there is no net gain or loss of money to any capital.

E has rank at $m-1$. Its solution space has dimension 1 and hence, all such p are multiples.

Lemma 2: exchange at prices other than the 'compatible exchange' prices leads either to monetary transfers, or to an imbalance of supply and demand.

Note on McGlone/Kliman:

In McGlone and Kliman (1996) there is an important demonstration that material reproduction is possible for any set of prices. This demonstration does not conflict with the findings above as regards the material reproduction of inputs to production. However McGlone and Kliman do not enquire into the distribution of capitalist purchases. Disparities between the quantities of use-values which the capitalists can purchase in the various departments can therefore arise, even though in aggregate there is always sufficient income, as they correctly point out, to re-purchase the inputs required to continue material reproduction.

In their own example, if the price in department I is zero, the capitalists of this department do not have enough money to pay their workers, for example.

Secondly, the purpose of McGlone and Kliman's enquiry is slightly different from my own. They wish to defend, and succeed in defending, *Marx* against Bortkiewicz's assertion that material reproduction is impossible without stationary prices. They do not therefore need to introduce Say's law in the form in which modern economics applies it, insofar as they do not need to consider the pattern of personal

³¹ If these are presented in terms of labour-hours, we obtain a value-vector instead of an exchange-value vector; over the whole of the economy, the sum of the elements of the value vector is an invariant. The proof above does not depend on this fact.

consumption. It is possible, therefore, for period-on-period disparities between the quantities of goods purchased in each sector to be compensated by equivalent disparities in capitalist consumption.

If we ask what monetary resources the capitalists have in order to make their purchases then we must consider the profits of the last period, which are not given by the requirement to renew production but by the difference between their sales and the purchases the capitalists have already made.

Suppose bourgeois demand in each period is a static matrix B (this is the most general assumption, in which bourgeois consumption differs from sector to sector. A fixed basket of bourgeois consumption is just a special case of this)

Capitalist profit is $p_t X - p_{t-1} C - p_{t-1} V$

where C is constant capital and V is variable capital, and output is X. Under material reproduction these are identically the same. Capitalist purchases to renew production on the same scale, and to repeat the identical consumption pattern, are

$p_t C + p_t V + p_t B$

Capitalist income is

$p_t X$

which must be equal to $p_t B$ in order for the capitalists to repeat their pattern of purchases. This requires

$p_{t-1} C - p_{t-1} V = p_t C - p_t V$

and hence $p_{t-1} = p_t$ unless C+V is non-singular.

(TBA)

9. References

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