A dialogue concerning the two chief systems of value

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Abstract

This paper was presented to the Brasilian Society for Political Economy at its 1998 conference. It presents the principal differences between the temporal and the simultaneist approach to the theory of value. It was the first paper to present a formal conceptual analogy between the temporal approach in economics, and the Galilean approach in astronomy. At that time, the problem which I sought to address was, how is retrogression possible in economic thought? This same question is at the centre of my response to Laibman in 'The new value controversy in economics'.

A DIALOGUE CONCERNING THE TWO CHIEF SYSTEMS OF VALUE

1 Preamble

I begin by thanking the Society for Political Economy for its generous invitation and for the first opportunity I have had to present the temporal approach to value in full, and also to encounter at first hand the the rich Brasilian heterodox tradition.

I warmly invite your members to the fifth conference of the International Working Group on Value Theory on March 12th-14th, 1999, in Boston. It is a pluralist event and all contributions generally related to value are welcome; in particular, you don't have to agree with this paper. Indeed, if you disagree, it is all the more important to hear your views. Our web page is also open to contributions.

Economics is a pyramid, organised from the North. We know it is difficult for South American economists to be heard in the USA; the quality of the papers I have seen shows that economic theory is the loser. The majority of IWGVT contributors come from outside the USA; any collaboration that extends this international participation is always welcome.

Though any errors in this paper are my own, it is the fruit of a long collaboration and the individual and distinct views of many others, often suppressed or ignored by the world of official economics. I acknowledge a particular debt to Andrew Kliman and to Alejandro Ramos, both of whose work predates my own, and hope that the SEP will be able to hear from them in the near future.

2 Summary of conclusions

(Note from AF: this was initially distributed as a separate paper)

2.1 The temporalist and simultaneist (equilibrium) paradigms

(1) Most of this paper was dedicated to explaining the new approach to value, which we variously term the *Temporal Single-System* (TSS) approach. This results in a distinct definition of value, and hence a distinct definition of all other substantive categories of economics

(2) I argue that this belongs to a distinct *paradigm,* the temporal or non-equilibrium paradigm, which is a minority, heterodox wing of more or less every branch of economic theory: Post-Keynesian macroeconomics, process or recursion theory in econometrics, Austrian and neo-Austrian marginalism, monetary circuit theory, and so on.

(3) The distinctive feature of temporalism is, quite simply, that it supposes the past produces the future. More concretely, it defines its objects without presupposing any fixed relation between them. Above all, it does not presuppose a stationary state economy in order to deduce the fundamental categories of price, value, profit, or money.

2.2 Equilibrium: a Platonic ideology

(4) Temporalism stands opposed to the dominant tradition in economics which we term the *simultaneist* or *equilibrium* paradigm: the ISLM interpretation of Keynes, simultaneous equation econometrics, Walrasian general equilibrium, monetarist and quantity-theory analysis of money, and so on.

(5) The function of simultaneism is not reducible to a particular model or explanation: it constitutes an ontological system: a *definition of what is*. Above all, it approaches this by eliminating motion; it seeks to define the objects that we study by asking what they would be like, if they never changed.

(6) This ontology, which has its origin in the method of Plato, substitutes an *ideal* system for the real world. It claims that this ideal system represents the world. In consequence, it becomes impossible to theorise crisis or imperfection in the market, which is perfect by definition. Any imperfection must therefore result from 'outside' interference: from exogenous factors, imperfections, adjustments, or shocks. These are the names which economics reserves for the things that it cannot explain: by *definition* they are not the product of the market, but a deviation from it. The market therefore, *by definition,* cannot violate the conditions for its own existence. This ideological function is the prime reason for simultaneism's dominance.

(7) The dominance of simultaneism makes economics a retrogression compared to all true sciences, which have progressed to the temporal paradigm: the Copernican concept in Astronomy, the laws of motion of

Physics elaborated by Galileo, Newton and Einstein, the atomic concept in chemistry, the evolutionary concept in biology, and so on. Simultaneism is Creationist Economics.

2.3 *The use-value concept of value and its relation to simultaneism*

(8) The concept of value towards which all vulgar economics is drawn, as a result of commodity fetishism, is the idea that the measure of production is *use-value*; the size of a thing. Faced with the dual aspect of the commodity defined by Marx, who clearly distinguished exchange-value from use-value, they impose an immediate and violent unity between these two aspects and seek to *measure and define the value of goods in terms of their quantity*: that which Marx termed 'riches' as opposed to 'wealth'.

(9) It is impossible to derive a coherent and consistent use-value concept of value, except in equilibrium. The relation of the simultaneist paradigm to the value concept is therefore the following: it provides a logically-coherent value concept rooted in use-value.

(10) The unscientific character of this value concept is the following: it does not, and cannot, describe or approximate to reality. In particular, it cannot describe a reality in which there is systematic secular change – in particular, inflation and technical change. Temporal calculation in systems undergoing secular change leads to systematically different results, in many cases *directly* opposed to the results which economics takes for granted.

2.4 *Physicalist and Marginalist variants of the use-value concept of value*

(11) The use-value concept in economics takes two forms, representing the two aspects of use-value. It is no more possible to separate the use of a thing from its body, than to separate the body of a thing from its use. Despite the violence of the dispute between marginalist and physicalist schools, I argue that they share a common value concept.

(12) I do not deny the scientific merit of this dispute, which, as Sraffa intended, demonstrates the contradictions that arise from a one-sided presentation of use-value as pure utility. The basis of this demonstration is precisely the unity of the two aspects of use-value. But any subsequent attempt to ground an alternative concept in the purely physical being of the commodity is equally one-sided. For this very reason it does not establish an adequate alternative value concept.

(13) We define the specific combination of simultaneous paradigm with a use-value value concept to be the essence of the neoclassical concept of value. When we refer to a 'neoclassical value concept' this is what we mean. It is not intended as a term of abuse, but as a precise, scientific characterisation; as a definition of a coherent set of logical presuppositions or axioms, which we must entertain if we are to think with this value concept, and which must be found in the world if this value concept is to apply to reality.

2.5 *Neoclassical Marxism*

(14) The evolution of the Marxist wing of economics, from Bortkiewicz onwards, has been to perfect an interpretation of Marx *as if he were promulgating a neoclassical value concept.* In particular, all simultaneist versions of Marx, it can be shown, yield a use-value measure of value when time is introduced.

(15) Therefore, Marx's actual contribution to economics, whether wrong or right, has never been assessed by economics. Instead it has discussed – and dismissed – a *neoclassical Marx*; the economists have attempted to understand, and indeed, for three generations have promulgated, their own concepts as if they were Marx's. The contradictions and errors that they discover arise, not from Marx's value concept but from the neoclassical value concept.

(16) We therefore find that, in economics *two value systems* stand opposed to each other, namely, the use-value concept, which is rendered coherent only by the simultaneist paradigm, and the temporal paradigm, which is rendered coherent only by the labour-value concept. But the labour-value concept in its temporal form has never been assessed by economics. To this extent it cannot possibly conduct itself as a science, since it completely excludes an entire theoretical account which, moreover, explains most of the real phenomena that it cannot itself account for.

2.6 What is to be done?

(17) Because it is an ideology in constant conflict with the real world, economics is in a constant state of crisis which is at this moment particularly sharp. This crisis produces a constant flux of ideas which break and fragment away from the neoclassical value concept, and are then re-absorbed within it, or destroyed.

(18) Individual contributions and insights which result from such breaks can and do possess genuine scientific merit, either in that they succeed in explaining things that happen in the world, or that they develop concepts which do not depend on a Platonic ontology.

(19) Nevertheless, economics consistently demonstrates that because of its social function and organisation, it will not permitt any complete theoretical development beyond individual insights.

(20) The method by which economics prevents such a complete development cannot be reduced to the bad practices of its organisers; it is a church, and the only way to reform a church is to deprive it of secular power. It is in fact the *simultaneist paradigm itself*, as a method of conducting and organising discussion, which prevents any coherent theoretical development. This can be seen from the practices of many past debates among heterodox but simultaneist currents, who constantly fragment and frequently fight among each other with more vigour than they fight the mainstream, around issues that seem to resemble ancient debates about the number of angels that can dance on a pin.

(21) This fragmentation derives precisely from the substitution of the methods of neoclassical debate for genuine scientific discourse, and the way that this intersects with the organisation of the economics profession. Instead of argument with respect to *evidence,* simultaneism substitutes argument with respect to *authority and pure logic*. The attempt which is made by each dissident school, therefore, is to set itself up as a unique source of authority, with graduate schools, professorships and prizes. But this necessarily sets it against all other schools. Since every such individual schools necessarily offers one-sided and partial insights, and since the funders of economics in any case always promote the more confortable, equilibrium variants in each school, the apparatus of the economics profession works very effectively to prevent the evolution of science.

(22) The alternative requires what I term *critical pluralist engagement*; a genuine confrontation in which each is prepared to examine, and confront, the concepts of the other *without eliminating them a priori as logically illegitimate*.

(23) This is not a post-modernist view. I do not argue that all points of view are equally valid or that no criterion of truth exists. I argue, however, that the question of validity, and the question of truth, *may not be settled from within the profession of economics.* The practice of heterodox economics should aim at making all the various points of view, and their conclusions, available to the general public: to restore to the public the right to make its own judgements on matters of economic theory and policy. This is not merely a scientific, but a democratic duty.

(24) The simultaneist paradigm militates against critical pluralism. Simultaneist thinking finds it very hard to conceive that it may be possible to think about the world differently, and reacts very violently against temporal alternatives, for the reasons given above. This leads me to conclude that the principal task, in developing a scientific alternative, is to develop an effective and pluralist dialogue between temporalist currents. I agree with the 'Weintraub-Davidson-Eichner' project to create such a dialogue but with one obvious amendment: hitherto there has been no temporalist Marxism. Now there is, and it should both be included, and seek to be included.

(25) I do not argue to exclude or denounce simultaneist ideas from this dialogue. The problems arise only because simultaneist thinkers systematically tend towards solipsism: to argue as if their own way of conceiving the world were the only one possible. This makes it very hard to hold a discussion. I propose only, therefore, that there are certain rules of discourse which we need to establish, to prevent a recourse to tradition, logic and authority as a substitute for genuine open engagement.

3 Introduction: what is the relation between value and time?

I propose the following initial argument, which I think is of interest to all branches of economic thought, though perhaps particularly Post-Keynesians and Marxists, to whom it is directed. It has two propositions:

(a) value demands dynamics

(b) dynamics demand value

Obvious though these ideas are, the entire profession of economics, probably since its inception in the late 1860s, and certainly since its reconstruction by American positivism early this century, is organised as a sort of permanent Jesuitical crusade against them.

In short, we do not confront a 'normal' scientific debate because the profession for which we work is not a science, but a machine for suppressing science.

My argument must therefore follow an unusual course; I have to conjoin a study of the value concept to an analysis of the ideology that denies it.

4   The loud silence

For eighty years, there has been a universal consensus in economics that Marx's value concept contains fundamental logical errors. Ian Steedman (1977:49n) summarised the outcome in 1977:

> The present type of argument has been examined in various forms, by many different writers over the last 80 years. The same conclusions have always been reached and no logical flaw has ever been found in such arguments.

The logical flaw was explained within ten years,[1] though it has taken nearly twenty years for this to be recognised and this recognition is still absent from the official literature.

Moreover, when the necessary corrections are made to the argument, we find a wholly consistent and rigorous value-theoretic framework that explains the very phenomena which economics cannot: the persistence of crisis, the long-term growth of inequality, permanent technical revolutions, mass unemployment, and so on.

Among the writers who 'examined the present type of argument' we find the finest brains in economics: Böhm-Bawerk, von Neumann, Samuelson, Morishima, and many others. The entire profession takes Marx's 'logical errors' for granted and considers this sufficient reason to eliminate his writings from its thinking. Even when they discuss Marx, the economists do not assess Marx's own ideas but 'corrected versions' which they make on the grounds that his original concept is incoherent.

Steedman's point was valid. However, if these writers were wrong, his argument does not rest but turns about 180° on its axis. Its full force now applies – in the opposite direction. We pose three questions:

(a) How was it *possible* for the best brains of economics, to make such a huge mistake for eighty years? How was it *possible* for an allegedly scientific discipline to suppress a perfectly coherent account of the world emanating, moreover, from its most eminent founder? What does this tell us about this profession and its methods of investigation?

(b) What *else* has it got wrong? What trust can we place in the judgments or doctrines of a large organisation of intelligent people that commits, and slavishly perpetuates, such a colossal logical blunder? What about the IMF's restructuring packages, the trade-liberalisation offensives, the privatisation and deregulation drives: if the same logical error lies behind these proposals, what confidence can anyone place in their validity?

(c) What, if anything, can be done to put right what economics, for eighty years, has got so wrong?

4.1 Marx as heretic

The key to every ideology is its heretics. To understand the Roman emperors, one asks why christians were thrown to lions. To understand catholicism one asks why witches were burned. To understand Jesuitism, one asks why Galileo was brought to trial. To understand modern economics, one asks exactly what makes Marx – its foremost and most trenchant critic – so unpalatable that his work may not even be mentioned, except to anathematise it. In short, the spotlight is no longer on Marx: it is on the profession which cannot speak his name.

It is for this reason – though not only for this reason – that these issues are not the narrow concern of a small group of marxists, but should be addressed by everyone is concerned about how economics will be practiced and used in the Twenty-First century.

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[1] Kliman(1988) demonstrates the consistency of Marx's theory of the tendency of the profit rate to fall and early work by Carchedi carries the same implication, though not explicitly stated. Kliman and McGlone (1988) demonstrates the consistency of Marx's transformation in a temporal framework. Wolff, Roberts, and Callari, A. (l982) demonstrated the consistency of Marx's transformation in a simultaneous framework only five years after Steedman's challenge. Others, notably Ramos and Rodriguez and Moseley, reproduce these latter results with different accompanying explanations. Economics continues writing, however, as if none of this work existed.

5 On rethinking

5.1 Different paradigms, not different models

The conclusions of *temporal* approaches, as we call them, are quite startling. Applied to value theory, they have led us to rethink many things that most economists − not least Marxist economists − take for granted. We have had to overturn our ideas, not just about how we calculate value or price, or profit, but what these words actually mean. Changes of this type, which following Kuhn I term paradigm changes, are always the most difficult for established thinking to accept. As Kuhn notes:

> Consider, for another example, the men who called Copernicus mad because he proclaimed that the earth moved. They were not either just wrong or quite wrong. Part of what they meant by 'earth' was fixed position. Their earth, at least, could not be moved. Correspondingly, Copernicus' innovation was not simply to move the earth. Rather, it was a whole new way of regarding the problems of physics and astronomy, one that necessarily changed the meaning of both 'earth' and 'motion.' Without those changes the concept of a moving earth was mad." (Kuhn 0000:149-150)

A paradigm difference does not reduce to a clash of models or calculations. Each paradigm gives a different meaning to the concepts it employs, expresses the laws governing their mutual relations differently, and hence conducts their empirical study using distinct methods.

Our conclusions are difficult to accept, not because they are mathematically complex − on the contrary, they are a great deal simpler than what has gone before − but because they are involve a complete conceptual revolution. It seems, when one begins to think along the lines that we have been drawn to, as if nothing that one ever considered to be certain, can be trusted any more. One must rethink absolutely everything, from the very beginning − as is always the case in any major scientific revolution.

5.2 Digression: a short mathematical statement of the problem

A short mathematical statement may help, though the listener can skip this argument of required.

If x^t is a state vector, a *temporal* definition gives x^t as the solution to

$$x^{t+1} = f(x^t),$$

or , in continuous time, $\qquad x = f(x, x', x''\ldots)$

and simultaneism defines it as the *fixed point* $\qquad x = f(x)$.

Comparative statics is said to introduce time; in fact it partitions x^t into $\{y, a\}$ where a is a parameter vector that changes in time, and solves

(1) $$\{y, a^t\} = f(y, a^t)$$

giving x as the fixed point of $f(., a^t)$ for each successive a. This give the illusion of motion but is quite different from the temporal solution

(2) $$\{y^{t+1}, a^t\} = f(y^t, a^t)$$

or , in continuous time, $\qquad \{y, a\} = f(a; y, y', y''\ldots)$.

It also yields no continuous equivalent; when the time period is reduced to zero, in general it produces singularities. The essential view of the simultaneist paradigm is that equation (1) constitutes an *adequate approximation to reality*. We argue that it cannot possible do so. In general the solution to (3) is necessarily different because of the appearance of *dynamic* or *path-dependent* terms in the equation. If, in particular, the parameter a is changing secularly in a single direction, the results of the two approaches are completely different. Since a includes both technical change and inflation, in general, the two approaches yield different results.

5.3 The simultaneous paradigm; an initial statement

The current, generally-accepted definition of value − which comes to us through a very specific line of inheritance, via Bortkiewicz, Sweezy, and successive refinements by Seton and Morishima − defines both value and price with respect to a *stationary system*. Value is defined as the set of exchange ratios that can reproduce, without excess supply or demand, and without change, an economy from which capital is absent. Price is defined as a different set of exchange ratios which can reproduce, also without excess supply or demand, and also without change, an economy in which capital is so completely mobile as to yield a uniform profit rate.

Time is not merely suspended, but abolished, in this approach. The essential argument is that we may approximate to a moving system by first abstracting from the motion, and then re-introducing it afterwards. All the objects of the system are defined at the *same time*. For this reason, the name we give to this approach is the *simultaneous* or *simultaneist* paradigm.

It is our argument that simultaneism involves, not just a calculation, but an ontological definition. It defines value *to be* the solution to a set of simultaneous equations. In consequence, it demands that all motion is abolished before the category itself can be established. It acts, in effect, as if Marx had written Volume II before Volume I, and had taken the requirement to reproduce capitalism to be the definition of value.

The result is, we maintain, that the motion that was removed at the outset cannot then be re-introduced. One may speak of equilibrium using a non-equilibrium concept, but one may not speak of non-equilibrium − that is, reality − with an equilibrium concept.

If, therefore, value is defined in another way, without the prior supposition of stationarity, the difficulties are far greater than merely comprehending our computation. The results that we come up with are literally inconceivable, in a simultaneous paradigm.

5.4 The temporal definition: an initial statement

We begin with a temporal definition of value. We define value *without the prior supposition of stationarity.* Precisely because value is defined differently, so is everything else − price, profit, capital, productivity, technical change, money, inflation, output, not to mention cause and effect. The results contradicts 'traditional commonsense' in economics because, though we use the same words, we do not mean the same thing.

The ontological framework is therefore different. One of the first things that must be confronted, if one abadons the comforting crutch of supposing that the world is made up of eternal and unchanging universals, is simply to be able to decide what exists. One must confront, head-on, the problem of *persistence*; how it is that something which changes in every respect, nevertheless in some sense continues to be. Each day, every atom of our bodies is completely renewed. Nevertheless, the persons that we are, remain in some sense, identical through their difference.

When we move from the individual to the quantifiable, this same issue assumes the requirement of a concept of *conservation*; in order to formulate the idea, for example, of a *capital of $1000* even though this capital completely changes its bodily form during its various transformations, we require the idea that some abstract identity-through-difference is preserved despite these changes. Value, in our view, is the fully rigorous formulation of this view.

As we will see, however, accepting this way of looking at things involves rethinking the very notion of what a theory consists of. To take just one example, in our, temporal framework, *cause* means the same thing as it does in everyday speech. Before one thing can be 'caused' by another, it has to follow it in time. The idea, therefore, that the value or price of a commodity today may be 'determined by' its value or price tomorrow, is − though commonplace in economics − as alien to our paradigm as it is to the person on the street. To take another example 'price' for us is not something that we can determine. It is a datum, something that is observed in the world; the actual sum of money paid for a thing. The idea, again commonplace in economics, that the true or natural 'price' of a thing is something different from the money paid for it, is again as alien to our paradigm as to any normal human being.

In our view, therefore, what is at stake is not just a difference of models, but a difference of world-views; a gulf every bit as large as that which separated Copernicus and Galileo from the Ptolemaic astronomers and their clerical successors.

Our results can, therefore, be understood only by suspending the 'commonsense' that we learn from economics, and approaching them with a genuinely open mind.

5.5 The source of simultaneist resistance

Why is the temporal paradigm so vigorously resisted in economics? In our view, because its conclusions are a marketable commodity. Its ontology, which has its origin in the method of Plato, substitutes an *ideal* system for the real world. It claims that this ideal system represents the world:

> There exists, first, the unchanging form, uncreated and indestructible, admitting no modification, and entering no combination, imperceptible to sight or the other senses, the object of thought (Timaeus 20).

The issue is not just the idea of universals or essences but a specific concept of them: form is *that which does not change*; and this is the true reality. This leads to a view remarkably close, in fact, to the way that economists conceive of the real world and its relation to their ideal pictures of the market.

> No-one, I should say, can ever gain knowledge of any sensible object by gaping upwards any more than by shutting his mouth and searching for it on the ground, because there can be no knowledge of sensible things…These intricate traceries in the sky are, no doubt, the loveliest and most perfect of material things, but still part of the visible world, and therefore they fall far short of the true realities – the real relative velocities, in the world of pure number and all perfect geometrical figures, of the movements which carry round the bodies involved in them. These, you will agree, can be conceived by reason and thought, not seen by the eye …Accordingly, we must use the embroidered heaven as a model to illustrate or study these realities (Plato, *Republic* 7:529A, cited in Sambursky 1987:44);

We merely note in passing that Walras avers:

> A Truth long ago demonstrated by the Platonic philosophy is that science does not study corporeal entities but universals of which these entities are manifestations. Corporeal entities come and go, but universals remain for ever. Universals, their relations, and their laws, are the object of all scientific study. (Walras 1984:61)

and that Bortkiewicz introduces his correction to Walras thus:

> Alfred Marshall said once of Ricardo: 'He does not state clearly, and in some cases he perhaps did not fully and clearly perceive how, in the problem of normal value, the various elements govern one another *mutually*, not *successively*, in a long chain of causation'. This description applies even more to Marx … [who] held firmly to the view that the elements concerned must be regarded as a kind of causal chain, in which each link is determined, in its composition and its magnitude, only by the preceding links … Modern economics is beginning to free itself gradually from the successivist prejudice, the chief merit being due to the mathematical school led by Léon Walras. (Bortkiewicz 1952:23-24)

Using such an ideal system it becomes impossible to theorise crisis or imperfection in the market, which is perfect by definition. If one goes further and asserts, like Plato, that the ideal model is the truly real, and the truly real is just an imperfect copy, then any observed imperfection must result from 'outside' interference: from exogenous factors, imperfections, adjustments, or shocks. These are the names which economics reserves for the things that it cannot explain: by *definition* they are not the product of the market, but a deviation from it. The market therefore, *by definition,* cannot violate the conditions for its own existence. This ideological function is the prime reason for simultaneism's dominance.

The dominance of simultaneism makes economics a retrogression compared to all true sciences, which have progressed to the temporal paradigm: the Copernican concept in Astronomy, the laws of motion of Physics elaborated by Galileo, Newton and Einstein, the atomic concept in chemistry, the evolutionary concept in biology, and so on. Simultaneism is Creationist Economics.

5.6 Against dogma: for genuine pluralism

It is not our intention to found a new source of authority. We do not demand either that economics must agree with us, or that it must treat our reading of Marx as the only one possible. However, a scientific audience *is* required to accept that our argument is *legitimate*; that is, it is possible to think in the way that we propose, and that it is possible that Marx, too, thought in this way. We *do* therefore demand that economics cease presenting *its own version* of Marx as the only true version: this is the true dogma. We *do* demand that it cease suppressing alternative interpretations of Marx, and we do demand that it abandon its unfounded claim that Marx can be ignored or re-interpreted, because of errors which, in these alternative interpretations, do not exist.

5.7 Against the abuse of logic

The difficulty of debating across paradigms has led most of our opponents to treat our results as the product of some kind of simple mathematical trick or deceit, not worthy of considering as a true theory. I will discuss these methods of argument shortly. Nevertheless, though I would not be so foolish as to claim no future error can be discovered, I can assure you that these ideas have been subjected to very intense debate and criticism for over five years and I think there are now sufficient ground for saying that they are not likely to be overturned by a purely logical argument.

Unlike Ian Steedman, and, to be fair to him, most of economics, I do not draw from this the conclusion that my opponents are wrong, or that I am right, simply because our argument is proven in logic. This is a method of debate which, in my opinion, we must all leave behind us.

In my view, the issue is an entirely different one. Most explicit theories of value contain an implicit logic that is consistent *if one adopts the conceptual structure that goes with the theory*. The questions I pose are threefold:

(a) What really is this underlying conceptual structure? What *presuppositions,* what *axioms*, must we adopt, in order to think in such a way? This is the true application of logic.

(b) What relation does this conceptual structure have to reality? Does it explain the observed facts which any educated person can verify: does it make sense of the world? This is the true application of science.

(c) What relation does it have to the known work of Marx? Does it makes sense of his ideas and are we justified, therefore, in *attributing* this theory to Marx when we judge his work? This is the true application of honest debate.

All three of these are jointly required for a scientific endeavour.

5.8 *In defence of rationalism, in defence of democracy*

The question I ask is drawn from the old, Galilean, rationalist agenda. Contrary to the normal tradition in economics, I do not dismiss my opponents by demonstrating faults in their logic. Nor do I dismiss them by proving that they cannot claim the authority of great people − least of all Marx himself. My question is: can they explain the world we live in? My criterion is that of *realism* and my judgement is based on *evidence*.

In my view, the 'Marxian heresy' consists precisely in the fact that it explains the world we live in; and this is precisely what the profession of economics finds an anathema. The question that then arises is an obvious one. If the conceptual structure of the profession of economics does not serve the function of explaining reality, what function *does* it serve?

However, I couple this to an unusual observation: economics, alone among the 'sciences' reserves to itself the right to judge its own conclusions. We are allowed to test what doctors do: we can see, with our own eyes, whether the patient dies or gets better. The economists, however, cure no-one and kill many people; yet ordinary people without economic qualifications are not presumed capable of telling the economists that they are wrong.

In my view, the entire point of the Galilean revolution in scientific method does not reduce to the use of experiments or to 'falsification'. Galileo asserted something much more fundamental against the church: he asserted that people other than God's appointed had the right to judge what God had done. This was, in fact, the basis of Bellarmine's objection to Galileo which was, strangely enough, a kind of pluralist objection. He accused Galileo of presuming to determine *for himself* which of the two possible explanations of God's work was valid; this, he argued, was blasphemy because only God knew his own reasons. He obliged the church to submit to the judgment of non-clergy, of the ordinary person.

The revolution that is required in economics is this: we should oblige the economists to submit to the judgement of the non-economists, on the evidence of ordinary and commonly-observable facts.

6   The value concept: a universal element of economic theory

I said above that because value is defined differently, so are all other things. Nowadays, when economists hear the word 'value', they assume a Marxist is speaking. The Marxists themselves react to this label defensively, even making value a point of special pride, as if value were a category which no-one else uses.

I assert to the contrary that all economics *implicitly* possesses a value concept. It is no more possible to do economics without value than physics without space. The very words 'value of money' demand that this value be defined. When any economists speaks of something that money buys, which is not itself money, she or he articulates a value concept.

Our problem is not, therefore, to defend the need for a value concept. It is, by logical examination, to force each branch of economic theory to examine the concept of value which it uses in any case, whether or not it admits it.

Consider the very idea of the price level. Without it, economics cannot even formulate the quantity of theory of money, let alone discuss if it is true.

But what *is* the price level? It must mean a ratio between some measure of output which is different from price, and price itself. In short, it is a measure of value. If economists say that the price level has risen by 10%, they must mean that $1 buys 10% less of *something* – but hardly ever enquire into what that 'something' is, least of all question whether it can be rigorously defined. This is actually quite scandalous: it is as if physicists spoke of 'energy' or biologists of 'species' without any debate or enquiry into what these words meant.

The implicit measure of value used in economics is the macroeconomic magnitude called 'real output'. It is the nominal price of a thing, deflated by the GDP or some other deflator.

Whatever sophisticated microfoundation is offered for this measure, it is in fact a cardinal, linear, and non-marginal measure. If we add together two assets whose 'real' value is $1 and $1 we get another asset whose 'real' value is $2, by the very nature of the price index calculation. That is, its value measure is a *money of account*.

Economics speaks as if there were only one such measure; the recent debate in the USA provoked by the Boskin commission shows that things are quite different. The Boskin commission proposed to modify the consumer price index downwards, in order to reduce government spending on indexed welfare payments such as pensions. It thus accused the BLS of *overstating inflation*. But it rapidly emerged that a lot more was at stake. For, if the BLS had overstated inflation, it had *understated real output.* But if it had understated real output, it had likewise understated productivity. It had moreover understated real profits, hence economic performance in general.

The nexus of economic relations that this uncovers is as follows:

(1) From any concept of value, there follows a concept of price level, and vice versa. The price level is simply aggregate price divided by aggregate value, however this is defined,

(2) But likewise from any concept of value, there follows a concept of *output*; since aggregate value produced per year is simply the definition of output, corrected for nominal changes in the price level.

(3) However from this also follows a definition of *productivity*; productivity is simply the ratio between value output and value input.

(4) There also follows the definition of surplus or 'value added' – and if the economists really believe the concept of value to be redundant, it is perhaps time they demanded we stop taxing it – this is equal to the difference between value output and the value of non-human inputs.

(5) The definition of profit itself then follows from these definitions. *'Real'* profit – that is, the value rate of profit – is equal to the value added, divided by capital advanced, measured in value terms.

(6) Finally, since the rate of profit is a determinant of investment behaviour, all this directly determines the way that an economic theory is obliged to view the actual motion of a market economy.

Note that the six statements above did not in any way assume a *particular* theory of value. Least of all are they specific to Marx's theory of value. They are conceptual relations that apply to each and every economic theory, which it must adhere to more or less consciously, and more or less rigorously.

A chain of conceptual connections leads from an underlying value concept, through all the key concepts of economics, to an actual theory of economic behaviour. The value concept adopted by any theory, far from being redundant, is the key to understanding how any economic theory actually works.

6.1 Production, circulation, distribution and value: a single concept

The issue is even more profound. The concept of value determines where the dividing line is placed between production and circulation, a distinction fundamental to economics. When economics seek to make a distinction between these two activities, what it always seeks to convey is the idea that one type of human activity *creates* that which is consumed elsewhere, and that another type of activity *allocates* this product to the final consumers. This distinction is itself meaningless, if it turns out that the allocation process is itself creative; there is no point in the distinction in that case.

Precisely what we mean by value *is* that which is created in production, since obviously, price variation is a phenomenon of circulation. In consequence, if we find out that price variations can bring about an increase in value without any productive activity, we have an incoherent value concept.

This is the true force of the capital controversy. Why did it matter to economic theory, whether capital was a factor of production or not? Precisely because, unless capital is considered a factor of production, and if we use quantity or nominal price as our measure of value, we find that there is an increment in the value of the

product that cannot be accounted for in production. Therefore, we are obliged to 'invent' a new factor to make up the discrepancy – the 'factor' of capital.

With every new complication encountered by modern theory, it responds by inventing another factor, be it human capital, quasi-rents, or what-have-you; the reason for this inventiveness is the desperate need, in the face of a defective value concept, to plug the growing hole in the dike between the raging river of production and the calm lowlands of circulation.

This spills directly over into political analysis. Without a firm division between production and circulation, with the origin of value firmly located in production, we cannot theorise the notion of *transfers* of value. We cannot express the concept of exploitation or class division. We cannot rigorously express the notions of unequal exchange, nor explain the ever-growing gap between nations. The very notion of *distribution*, and the idea that the price system is an allocative process that transfers from one person, or one class, or one nation, to another, cannot be expressed without an adequate value concept.

This, also, is what Keynesian theory seeks for when it (rightly, in my view) strives to establish that distribution is in some sense 'prior' to price formation. The essential idea that needs to be expressed is this: some 'thing', some 'substance' is created in production, and the price mechanism consists of no more than the allocation of this substance, without changing its size.

6.2 *Marx's value concept in context*

This allows us to place Marx's own value concept in its rightful context and clarify, first, why it is such an important achievement to locate *labour* as the source of value, and second the underlying qualititative significance of his celebrated equalities

The whole historical evolution of the value concept is an evolution *away from physiocracy*, for whom the basis of value was *natural*: the reproduction of nature unaided and unorganised by people. For the physiocrats, production consisted in the production of things by means of things. On this basis, as Marx notes because of the very narrowness of their value concept, they successfully identified the relation between value and distribution. What they could not do, is identify the relation between either of these things and human society.

Successive refinements by Smith, Ricardo and Marx freed this value concept from its naturalist heritage and located it in specifically human, social, that is, conscious activity.

The place of Marx's value concept in the history of economic thought is the completion of this evolution. In his work for the first and last time all production is rigorously and uniformly defined as a specifically human activity, and value is rigorously defined as its quantitative outcome. Economics since his death is not much more than an orchestrated media drive to prove it can't be done.

Labour, for Marx, is the universal substance of value because production consists, and only consists, of the application of labour. This is not just a definition of value but also of production. Labour is the conscious transformation of nature by humans for humans, and hence production *is* the application of labour both to nature and to past human products. It is not the unaided activity of nature, nor is it the passive self-motion of machines, and least of all is it mere existence.

As we have seen every body of economic thinking makes a distinction, vaguely or less vaguely, between production and circulation, and entertains the notion that in some sense production creates something new, and circulation only changes its ownership. What they do not realise, except in Marx's case, is that in making this distinction, they also determine a value concept. If, therefore, we define production so that non-human activities are included in it, then inevitably we find a non-human source of value; try as we might to measure value as a human activity, we will always find a place where it grows by itself.

For the physiocrats, nature was the explicit source of value. For Smith, 'stock' remained an independent source of value because he did not treat it as a product of labour. Ricardo's two great achievements were on the one hand to define stock rigorously as a product of labour, and on the other to define rent as a deduction from the product rather than an increment to it, finally freeing value from any natural basis. But he bequeathed a dual standard of value through which things as such were allowed to become again a source of value, though free of their natural origin. Value for Ricardo was on the one hand, the labour incorporated in a thing, and on the other hand, the amount of another thing for which it exchanged. When this second definition, the *use-value concept of value*, is insufficiently separated from the first definition, then economics ends up measuring things in terms of other things.

But these things are human constructions, alienated from their producers. The use-value concept of value therefore divides symmetrically into the physicalist and the utilitarian viewpoints; one conceives of value as if things existed independent of their use, and the other as if the use existed independent of the thing. In either case, the old naturalism of the physiocrats is restored in a new, fetishised form: the things which we ourselves create are endowed with the magical property of creating value out of themselves.

7 No value without dynamics, no dynamics without value

7.1 Some notation

It is useful to keep track of the units in which a quantity is measured by extending normal money symbols in an obvious way, writing h100 to mean 100 hours of labour-time. It is easier to see these by raising them, thus: $^b100$ means 100 bushels of corn. If omitted, the implicit unit is use-value.

Ratios can then be denoted by subscripting the denominator: $^{R\$}_h10$ means "10 Reals per hour". Usefully, subscripts and superscripts then cancel out just like fractions. For example if the exchange-rate of dollars for Reals is $^\$_{R\$}1.6$, then $^{R\$}10$ in dollars is $^{R\$}10 \times {}^\$_{R\$}1.6 = {}^\$16$

7.2 Why dynamics matters

It is widely supposed, and even asserted as a rigorous result, that the rate of profit is independent of the measure of value, numéraire, or money in which prices are expressed. This is false. This is fundamental to understanding why an adequate value theory cannot rely on the assumption of stationarity.

A simple dymamic calculation illustrates this point. Intuitively, the argument is as follows: suppose the price of the good concerned is rising independently of production. An asset consisting of this good will then yield an *own profit rate* expressed in money. If we purchase it for $^\$1000$ and, after a year, without engaging in production at all, it is worth $^\$1200$ then in money terms we have made a profit of 20%. In *general* profit therefore depends on the money of account. If Reals are inflating relative to dollars, then profits measured in Reals will be greater than profits measured in dollars.

Using our notation we can show this very easily. Let us write the exchange rate of Reals for dollars as $^{R\$}_\$e$ or, when no ambiguity is possible, simply e. Then given any dollar asset $^\$K$ we can write:

$$^{R\$}K = {}^{R\$}_\$e\,{}^\$K$$

and, differentiating, we get

$$^{R\$}K' = e'\,{}^\$K + e\,{}^\$K'$$

to get the rate of profit, divide by $^{R\$}K\ (={}e\,{}^\$K)$ and we get

$$^{\$R}r = \frac{e'\,{}^\$K + e\,{}^\$K'}{e\,{}^\$K} = \frac{{}^\$K'}{{}^\$K} + \frac{e'}{e} = {}^\$r + \frac{e'}{e}$$

If we have more than one money of account then the money rate of profit, expressed in one money, is equal to the rate of profit in the other money *plus an additional term* which is given by the proportionate rate of change of the exchange rate. This is a straightforward path-dependent, purely dynamic factor which is omitted in any static analysis.

If, now, one of these moneys is a measure of value, we then have a simple formula for the relation between the value rate of profit and the price rate of profit, supposing $ to be the money and h to be value:

(3)
$$^\$r = {}^hr + \frac{e'}{e}$$

where e is now the ratio between value and money, a magnitude which Ramos terms the *monetary expression of labour* but, in this more general context, we can call the *monetary expression of value*.

From this many things follows. For example

(a) there is a perfectly rational basis for liquidity preference, that is, for holding stocks of a money which is appreciating. For, in terms of any measure of value, there will be a rate of inflation e' such that the value rate of profit on money is higher than on any productive asset

(b) the neoclassical determination of price is indeterminate. For, the value of a money asset varies independently of its equilibrium magnitude. Therefore, money prices cannot be fixed in equilibrium.

(c) The linear production determination of prices is likewise indeterminate, and for the same reason.

(d) Not least, the conventional refutation of Marx's tendency for the rate of profit to fall cannot possibly be true, since it identifies only *one* rate of profit and does not state in what monetary unit this profit rate is

expressed. It merely assumes, as does all simultaneism, that the unit of account does not matter: that is, it supposes its result to be independent of the value concept. As we shall show, if a different, temporal value concept is adopted, Marx's analysis is fully and generally confirmed.

In short, we can derive most of the key critical instruments which heterodox theory strives for, merely by assessing the dynamic relation between the value and the price of an asset. But we can only do this rigorously if our concept of value does not presuppose that dynamics have been abolished. Otherwise the relations we have just established appear, not as a *property* of our value concept, but as an *internal contradiction* of our value concept: and this is exactly what has befallen most of economics.

It is for this reason that value is the idea which orthodoxy most fears to discuss; it is for this reason also that heterodoxy must force this discussion on orthodoxy.

7.3 Why value matters

But it now, we hope, becomes clear why it is essential, in specifying any dynamic system, to identify the underlying value concept. As we will note, there are a large variety of temporal approaches to economics: Post-Keynesian and Kaleckian, neo-Austrian, non-equilibrium Walrasian, monetary circuit, and so on. However, all of these merely *presume*, or take over from equilibrium economics, an implicit notion of value. No matter how critical Keynesian economics may be is of the idea that agents can negotiate in real terms, it does not and cannot hope to argue that the real-nominal distinction *makes no difference.*

But, precisely because it does make a difference, we have to specify what the difference consists of. We have to specify what real output really is: that is, we have to specify a concept of value. All other theoretical conclusions follow from this.

8 A simple illustration concerning the falling rate of profit

We will begin with a simple illustration. We suppose a market economy producing a single good. Since this idea has given rise to spurious objections, we note in passing that there are two commodities, the good itself and labour-power.

We suppose that this economy undergoes steady technical change, such that with a constant labour force, that outputs and inputs rise constantly but that outputs rise faster than inputs. For simplicity we also suppose that the workers consume nothing.[2]

We also suppose, again for simplicity, that it is possible to invest the entire product each year (maximum expanded reproduction).

To fix ideas we have chosen a sequence of outputs that gives whole numbers; the listener can easily obtain the same qualitative results for any sequence satisfying the assumptions above. Table 1 then gives the sequence in terms of use-values:

Period	**C**	**L**	Produces	**X**
1	10	10	→	12
2	12	10	→	15
3	15	10	→	20
4	20	10	→	28

Table 1: use-value, maximum expanded reproduction

C = means of production consumed as constant capital,

L = quantity of labour power

X = output

The time at which any variable is measured will from now on be represented with a superscript: 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].

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[2] 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.

8.1 The simultaneous value calculation

Now calculate the values which correspond to this sequence in the normal, simultaneous manner. To do this, we ask what price would, in each period, reproduce the economy *without changing its proportions* – even though its proportions are in fact changing. We must then suppose that the value at the end of each period is the same as the value at the beginning of the same period; otherwise, we cannot calculate any value at all. Hence for the first period, we can solve for the value v^1 by writing

$$^b10 \times {^h_b}v^1 + {^h}10 = {^b}12 \times {^h_b}v^1$$

omitting the subscripts this gives

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

We can calculate values in each period in the same way and so convert all magnitudes to values:

Period	v	^hC	^hL	Equals	^hX
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, maximum expanded reproduction

From this follow a number of conclusions that are taken as 'standard' conclusions in the normal interpretation of Marx:

Conclusion 1: values are directly determined by the physical structure of the economy. In each period, there is one and only one possible row in table 2, completely given by the corresponding row in table 1. Values are 'redundant'; use-values determine all the properties of the economy.

Conclusion 2: organic composition falls, and the rate of profit inevitably rises, with technical progress. Values are as just observed irrelevant to this conclusion; profit is directly given by the physical structure of the economy. We just subtract the physical input from the physical output and divide by the physical input.

Period	^bC	^bX	$^bX-^bC$	$R = \dfrac{^bX-^bC}{^bC}$
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: use-value, maximum expanded reproduction

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 rates of exchange, that is, actual prices, in fact they cannot be so given the sequence we have specified. The product at the end of period 1 is *sold* for $^h_b5$. But when used as an input in period 2, it would be paid for at the prices of period 2, so it would have to be *bought* for $^h_b3\frac{1}{3}$. If this were a real exchange, it would be impossible. A commodity cannot be sold for one price, and bought for another.

Conclusion 4: the value added to the total product is not equal to the time worked. At the beginning, we had $^h50$ in input. Consider the combined effect, now, of periods 1 and 2. No product was consumed except in production. The living labour added in both periods was $^h20$. We should have $^h50 + {^h}20 = {^h}70$. But we don't; we have $^h50$. 20 hours have been lost. It is hardly surprising that the organic composition falls, if we throw away half the value created at the end of every period.

Conclusion 5: 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. Somehow, people feel happier with the idea of something disappearing without trace than appearing without reason. Strangely enough, this happiness is confined to value; when money or people disappear without trace, it is a great deal more alarming than when they appear without reason.

Nevertheless, if we simply reverse the figures, the above reasoning creates value from nowhere. If we suppose a *decrease*, instead of an *increase,* in productivity, then the inputs to each period will be magically

greater than the output of the last period. Moreover, the greater the decrease, the more value from nowhere, so that the most productive activity of all is to do nothing at all but simply wait for nature to make inert copies of itself.

Conclusion 6: profits are independent of money: that is, they are independent of the numéraire. In a certain sense, this is the strangest conclusion of all, if we want to describe a realistic economy with such a concept, we must expect − as shown in section 7.2 − that money would have some effect on it.

The only circumstance in which the profit rate really is independent of the numéraire is if the numéraire is constant, that is, in a stationary economy.[3] Otherwise, there are as many profit rates as there are moneys or numéraires. But, according to the presentation above there is only *one* profit rate; this is 'the' profit rate, and Marx's great error was in failing to understand that it has to rise. Yet, as equation (3) shows, there are as many different profit rates as there are value concepts.

The question is therefore:

(1) Which *value concept* generates the result that the profit rate must rise with accumulation?

(2) Which value concept generates the result that the profit rate falls with accumulation?

(3) Which is Marx's concept?

(4) Which concepts best fits reality?

8.2 *Monetarising the simultaneous value concept*

We can enquire further into all these results if we ask the following question: how *could* such an economy function according to sensible market rules, that is, in such a way that the money paid for a commodity is equal to the money received for it? This would happen if, for example, at the end of period 1 we exchanged one hour of labour for $60/40 = {}^\$1.5$; 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 the *monetary expression of labour* to be the ratio between dollars and hours and calling this also ${}^\$_h e$ we have

$${}^\$_h e^0 = 1$$
$${}^\$_h e^1 = 60/40 = 1.5$$
$${}^\$_h e^2 = 60/40 \times 50/30 = 2.5$$
$${}^\$_h e^3 = 60/40 \times 50/30 \times 40/25 = 4$$

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

Period	${}^\$_h P$	$^\$\mathbf{C}$	$^\$\mathbf{L}$	Equals	$^\$\mathbf{X}$
1	5	50	10		60
2	5	60	15		75
3	5	75	25		100
4	5	100	40		140

Table 4: use-value, maximum expanded reproduction

Now we have a set of transactions that makes complete monetary sense. The money paid for everything is equal to the money received for it; all the figures add up, and so on. It also yields the exact same profit rates as the 'value system' exhibited at the beginning. But how has this been achieved? What we have actually done is to revalue the value 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. In short, we have a use-value measure of value. The only difference, therefore, between a 'labour-value' system calculated simultaneously, and a straightforward system of corn-values, is the numéraire.

8.3 *The temporal calculation*

The temporal calculation follows from the following, simple idea: the outputs have a different value from the inputs. While production takes place, values change. The value of the outputs is then given, not by solving a *simultaneous* equation but by solving a *difference* equation corresponding to the temporal order of the circuit

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

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[3] This point was first made by Townshend (1937)

We have to suppose an initial value v^0, as with any difference equation. This initial condition reflects the whole of a past history that we do not know. It can be demonstrated that the errors that might result from an incorrect initial condition decay exponentially. Here, for illustration, we suppose it to be 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 as the simultaneous value since we chose v^0 this way, to achieve a level playing field. 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, according to this concept, has declined but has not fallen as far as it would in the ideal, simultaneous, economy of table 2. We can now reproduce a different table of values in which we will write, in a separate column, the *value* rate of profit.

Period	C	L	X	X–C	$R=\dfrac{X\text{-}C}{C}$
1	50.00	10.00	60.00	10.00	0.2000
2	60.00	10.00	70.00	10.00	0.1667
3	70.00	10.00	80.00	10.00	0.1429
4	80.00	10.00	90.00	10.00	0.1250

Table 5: temporal value, maximum expanded reproduction

In this system,

(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 can appear from nowhere. The only source of value is living labour.

(c) There is no need for a variable numéraire to make the economy behave in a reasonable monetary manner. In consequence, the value contribution of labour-power is always exactly given by the time of labour.

(d) The organic composition of capital grows, and the rate of profit falls, exactly as Marx suggests. The 'experts' are wrong; there is no logical error in Marx's suggestion.

Note that conclusion (d) follows whether or not we agree with temporalist values. As soon as it is recognised that the above interpretation is legitimate and possible, the argument that Marx cannot but have made a logical error, falls.

9   A short restatement of the TSS approach

We now move on to a more general statement of what we term the 'TSS' ('temporal single-system') view, which extends to a full conceptualisation of price and money without the presupposition of equilibrium,

We begin by noting that TSS is not the only temporal value theory.[4] We combine temporalism with the single-system approach, a controversial innovation which bears a strong family relation to the 'New Interpretation'.[5] There are also simultaneous single-system approaches.[6]

In the New Interpretation, variable capital is measured not by the value of wage-goods, but by the value expressed in the money wage itself. When functioning as capital a sum of money represents value not by virtue of the labour in it, but because in circulation it represents the value of other goods themselves containing labour. If £1000 represents 100 hours, as observed we may define a coefficient, the *Monetary*

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[4] Cf Kristjansen (1998), Naples(1989, 1996)

[5] See the references in DL's paper. The approach is variously termed the New Interpretation, the New Approach and the New Solution. I use DL's own term, which I also think is the best.

[6] See Wolff, Roberts and Callari (1982), Moseley (1993), Ramos and Rodriguez (0000) and Lee(0000).

Equivalent of Labour or MEL: £10 per hour is the rate of exchange between value measured in hours, and value measured in money. In effect it is the inverse of the New Interpretation 'value of money'.[7]

Single-system approaches extend the New Interpretation idea to constant capital, which is represented, not by the value of the goods consumed in production, but by the value expressed in the sum of money that pays for them.

The New Interpretation and SSS approaches define the MEL as the *flow* ratio of new money value added, divided by new labour. I define it as the ratio between the money price and labour content of the *stock* of social capital.[8] Every sum of money then represents an aliquot part of the total value in existence and hence a definite number of past hours; if 100 hours are embodied in a total social capital priced at £1000 then each £1 represents, or expresses, (1/10) hour.

9.1 Determining the magnitude of value

We have not yet defined value quantitatively; we merely say it is measured in hours of labour-time and stated its relation to money. The difference between simultaneous and temporal approaches begins at this point.

Suppose a capitalist consumes $^{\pounds}100$ in constant capital (C), employing workers who add $^{h}10$ of living labour (L) to the product. Suppose additionally the MEL is $^{\pounds}_{h}10$. From this and the single-system calculation, it follows that we can restate the production process in hours. The $^{\pounds}100$ in constant capital represents $^{h}10$, and the workers add another $^{h}10$. The value passing into the stock of social value is

(4) $$^{h}10(C) + {}^{h}10(L) = {}^{h}20$$

This is determinate whether or not there are other producers of the same thing, or stocks of the same thing, or joint products. It simply says that L is added and C transferred to the whole of social value. We will shortly explain how this social value is fully determined.

Note that no particular time-period is indicated, and the calculation leads either to a discrete or a continous formalisation. However, goods that appear in a long time-period as being consumed entirely during production, are in a shorter time-period consumed only partially. It is impossible to make an artificial distinction between fixed and circulation capital based on duration.

9.2 Temporal closure: total social value and the MEL

In section 9.1 we supposed the MEL to be given. But from any initial value it is defined at all subsequent points, so that the value transferred to every product is fully determinate. To show this suppose all capitals, taken together, consume over any period $^{\pounds}C$ in constant capital and employ workers who add ^{h}L of living labour to the product. From the single-system calculation, we can similarly restate this in hours; the capitalists will pass value into the total stock of social capital equal to

(5) $$^{h}C + {}^{h}L$$

This does not yield the money price of the social capital, but for us prices are data, to be observed. We can in principle add up, at any moment, the total price of all goods in society, including all forms of capital such as money, work-in-progress, machinery, and so on.

Given an initial MEL, we can also ascertain the value of this same stock in hours. We need only suppose that at some starting point this is known. Then equation (5) tells us the new value that is added to it. What is lost to it? In the same period value will be lost from this total stock as goods are consumed. This loss has three elements that we are interested in: $^{\pounds}V$, the consumption of the workers, $^{\pounds}B$, the consumption of the bourgeoisie, and $^{\pounds}C$ which is just the used-up constant capital already referred to. But, as we have seen $^{\pounds}C$ is exactly replaced in the product. Value consumption is therefore straightforwardly $^{\pounds}(V + B)$, again known from price data.

Consequently we now know the total value in hours and in money of the new social stock. Dividing one by the other gives the new MEL. This closure renders all magnitudes so far defined determinate, without placing any equilibrium constraints on any of them.

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[7] A number of authors claim a *dimensional* incompatibility between price and value, beginning with Abraham-Froix and Berrebi. As Rodriguez (1996) notes, value has two measures, its *intrinsic* (labour-time) measure and its *extrinsic* (money) measure. Both value and price may be expressed in either unit, at all times and in all forms.

[8] In a one-period model this reduces to the ratio between the value and price (respectively) of the gross product; however here I will define the temporal approach without reference any definite period, to indicate its generality.

9.3 Conservation in circulation

The Bortkiewicz-Sweezy-Seton definition of value supposes that Marx takes prices to equal values in Volume I, and derives its definition of value from this idea. It then supposes that Marx takes prices as equal to prices of production in Volume III and interprets the transformation problem as the definition of the static relation between the two quite distinct, and quite ideal, stationary economies concerned. Hence our designation *dualist*.[9] Marx is read this way by almost all of economics, and all the 'inconsistencies' in Marx are derived from this reading.

Chapter 5 of Volume I of *Capital* entitled "Contradictions in the General Formula of capital" is a great puzzle for this interpretation: here, Marx systematically investigates what happens when price diverges from value. Moreover he does not just consider price of production but general, market prices; he examines every conceivable source of their deviation from value: market fluctuations, nominal price increases, even thievery and military conquest. His central conclusion is that *value cannot arise in circulation*. As we have seen, this is central to the concept of what production, and labour, actually consist of

In order to achieve his result, Marx makes a decisive break with Ricardo and Smith for whom value is conceived of as *equal* to price, a concept to which simultaneism incessantly regresses . Value in Marx is the substance of price, but not equal to price; something that is expressed in money but is not itself money, just as the mass of a material body is something that manifests itself in its size, but is not itself size. In consequence, value is conserved in circulation; that is, the *total magnitude of value in existence cannot be altered by merely changing money prices, in any way whatsoever.* This distinguishes Marx's value concept from every other economy theory, each of which pays lip-service to this evident idea, but always violates it in practice.

This, in our view, really is the 'fundamental Marxian theorem'. It logically precedes all further development, including the development of the categories of production, labour, and labour-power; it is historically general, in that it applies to all societies in which commodities exist, and it is an indispensible axiom for everything else in value theory.

A framework for analysing distribution, not a device for determining prices

The 'first equality' as specified above is tautological, but not trivial. Price-value deviations may exist within the product. The concept of value lets us quantify these deviations independent of the use-values involved. It allows us to theorise distribution as a process which *transfers value*. Without the notion of conservation, the very notion of a transfer is meaningless.

Moreover, it provides the answer to an insistent question in economics: *what is it* that gets redistributed when prices change? The answer is: socially necessary labour time. Any set of prices fixed by circulation, constitutes a distribution of hours of labour-time. The movement of money-prices is thereby revealed to be a disguised transfer of congealed labour-time. The analysis 'de-fetishises' exchange relations. [10]

Thus, suppose a product whose value is $^h6$ has a price of $^\pounds5$, and that the MEL is $^\pounds_h1$. The seller then receives $^h5$ in return for $^h6$: that is, s/he loses $^h1$ (or $^\pounds1$, which is the same thing expressed in money) by converting the product into money. The buyer gains this lost hour, since by the definition of the MEL, the value of the total product in hours must equal its price in hours. Therefore

(a) Price-value differences are precisely expressible as a relation between two forms of value.

(b) Every set of market prices effects a system of transfers of pre-existing values, created in production, between the owners of these values.

Without the conservation of value in circulation, neither of these results hold.

The fundamental question concerning the logical coherency of value theory is then the following: does the definition of production contradict these results? When we proceed, by analysing the categories of labour, labour power, individual value, social value, to determine how value is produced, are we forced to abandon

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[9] The definition comes from Ramos and Rodriguez (1996).

[10] A common response is that "you have no theory of value, because you cannot determines price". This illustrates the importance of paradigmatic differences: for us, it is not the function of value theory as such to calculate prices before they happen but to explain what they are, once they have happened. Galilean theory, likewise, cannot tell us where moon must be; it can only tell us how it will subsequently move, once we know where it is from observation.

the axiom from which we started, that this value may *only* arise in production? TSS finds that no contradiction arises.[11] Simultaneism does not.

9.4 Where the time comes in

The words 'a capitalist consumes ${}^{£}100$' were chosen with great care. It may of course be that between buying the capital and using it, the productive goods concerned rise or fall in price and/or value. What is the relation between the initial cost and the value ${}^{£}C$ transferred? Three views are known to me.

(1) the view attributed to us by many is that ${}^{£}C$ equals what was spent to get C: its so-called 'historical cost'. This is not to my knowledge the view of any TSS theorist.

(2) The view of all simultaneist currents is that ${}^{£}C$ is equal to what it would cost in the future to buy the elements of C, if these could be purchased after C is used up.

(3) The view I actually hold, as far as I know in common with other TSS thinkers, is that ${}^{£}C$ equals the value C possesses at the time it is consumed. In one special situation this reduces to case (1), namely, a one-period circulating capital system and this has given rise to misunderstandings that I am happy to correct here.

The calculation is fully determinate. We take the price of the goods concerned at the time they are consumed, divide by the MEL, and this gives us the value transferred. As Marx concisely puts it:

> The definition of constant capital by no means excludes the possibility of a change of value in its elements. Suppose the price of cotton to be one day sixpence a pound, and the next day, in consequence of a failure of the cotton crop, a shilling a pound. Each pound of cotton bought at sixpence, and worked up after the rise in value, transfers to the product a value of one shilling" (p209)

When measured in hours, the difference between the price at the time of purchase, and the price at the time of use, is the moral depreciation of the capital, of which more later.

The designation 'historical cost' as applied to the TSS calculation is thus misleading. The issue is not whether ${}^{£}C$ may be altered before it is consumed. The point is that it cannot be altered after it has been consumed, that is, when it no longer exists. Any rejection of such a notion perpetrates extreme ontological violence against all serviceable concepts of existence; it becomes hard to conduct any scientific discourse at all.

9.5 Value in, more value out; conservation in production

Because of this temporal definition, production cannot contribute any new value to society except L. Whatever ${}^{£}C$ happens to be when used is transferred to the product, and the same sum is removed by its use. Summing over all of society, the total value added to the stock of social capital in production *must* always exactly equal the time worked over *any* period, because at each point in the trajectory, no matter what the value of the constant capital happens to be as a result of any external fluctuation, what goes in is what comes out. Always and inviolably, ${}^{£}C$ is removed by use, and ${}^{£}C$ is transferred back in by the labour process. The two can never separate, because they happen at the same time.

This is precisely what simultaneism violates, as our section **Error! Reference source not found.** example shows: the product grows in value because it gets two valuations from two different periods at once. As the output of period 1 it has one value, and as the input to period 2 it has another. This circle is simply not squared, and so the value appears from nowhere.

Exploitation and the 'second equality'

Marx's 'second equality' arises as a genuine, non-tautological deduction from the analysis of production provided equation (5) is not contradicted by further development. The value which production adds to the total value in society over any period is exactly equal to the living labour. But the value consumed out of this by the workers is exactly ${}^{£}V$, the variable capital. Everything else falls to the capitalists *because* value cannot be created or destroyed in circulation. The conservation of value in circulation is therefore of immense social and political significance. Once we admit of a source of value other than labour, we also admit of a source of profit other than labour-power. But since labour is merely the human transformation of nature for other humans, we also admit of a source of profit other than humans.

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[11] Not all temporal approaches reproduce conservation in circulation: for example, mark-up prices do not. This is why we have always insisted that temporalism has to be combined with the single-system approach.

Our (Marx's) proof of the second equality applies not only in the case where profit rates equalise, but for every conceivable market price. The calculation is therefore fully general.

9.6 Neither production nor circulation: the world of phantom values

We have posed the issues as above to confront the core of the ambiguity in the simultaneist formulation, which is that it cannot identify whether the value lost through devaluation takes place in circulation or in production. Instead, value commutes, like Charon the boatman at the Styx, between the real world we live in and a phantom world of equations. *Why* is constant capital fixed? To this, temporalism gives an answer that simultaneism cannot. $^£$C is fixed because it is in the past. This is what renders it objective.

For temporalism output arises after C has been consumed. Therefore, even those temporal formulations that do not respect the conservation of value (for example, Kristjansen) at least recognise that the difference lies in circulation. Simultaneous formulations cannot even make this distinction because for them, C is determined in the future, after the product emerges. If therefore there is any general change in the interim, whether this be technical change, inflation or even a change in relative prices, then this must therefore retrospectively modify the value incorporated in the product by the constant capital.

A great deal of the confusion in many discussions of moral depreciation and capital devaluation arises, in my opinion, because when the value of constant capital is retrospectively modified, it becomes quite indistinct whether this modification takes place in circulation or in production. The change therefore takes place in some hyperspace which value may commute from without challenge from the mortal world we live in. In effect, Charon becomes a banker; we do not merely pay him his obol on crossing from the real to the ideal world, but collect it back with interest when we return.

This leads to a redefinition of 'socially necessary labour time'. In Marx, this refers to the time needed to make something with the existing instruments of production, in the society that we live in. Simultaneous valuation defines it as the time which would hypothetically be needed if every new technique were already fully implemented. This society that will never exist since, while the new techniques are being implemented, yet other techniques will come into existence. The moment the first brick is laid for a factory that halves the price of computer chips, without waiting for the chips to arrive and indeed for the factory itself to be built, the price of all chips, of all computers, of all products in which these computers enter, and so ad infinitum, must all fall. This is not socially necessary but Platonically necessary labour time

10 Moral depreciation and the formation of social from individual averages

My final point concerns the development of the temporal concept to deal with the formation of social values, that is, value itself. Here, I would like to make it clearer than elsewhere that what is proposed is so far my own personal view, not necessary shared by other TSS thinkers. Moreover, I would be more cautious about attributing it unambiguously to Marx. Nevertheless, I think that the correspondence with Marx's value concept is a good one and much textual support can be found for this. In particular, I concur strongly with Eduardo Maldonado-Filho's development of the *release and tie-up* of capital, which I think is a key concept in this respect.

My view was expressed in Freeman and Carchedi (1996:0000):

> Once a unified market is established, value and price emerge as an average over all the output of society. Marx concentrated his attention on the relation between individual producers and this market value. But everything he wrote logically applies to the entire stock of society; it would not make sense to exclude any portion of this on the basis of an arbitrary accounting separation which adjudges it an output of the 'last period' and therefore ineligible to take part in the formation of a uniform market price.

This is the core of my approach. The social or market value of every commodity at each point in time is formed as an average of the individual values of every portion of that commodity in existence, including unsold stocks, consumer durables, speculative holdings, fixed capital, and work in progress: Everything. The reason is that price is formed on that basis; in the course of establishing a unifom price, the market establishes a uniform value.[12]

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[12] The only possible caveat would be this: in my view the formation of a single market value is a concrete, not an abstract process, and goes hand in hand with the formation of a single price. To the extent that the market is incomplete, that is, does not bring all instances of the same use-value into the same exchange-relation, then it is conceivable that sets of partially-differentiated and separately-averaged values are formed. But in discussing a general theory, like Marx, we should begin from the assumption of a fully-developed market with a single price and a single value, and then modify this to deal with deviations.

This resolves the exact determination of the magnitude of value for individual commodities, postponed from section 9.1 The idea is very simple, since all existing stocks have a market value, and this is modified in each interval of time by the total of new value production. Thus suppose there are ${}^{t}K$ tons of a given commodity in existence, with value ${}^{h}K$. Suppose in a given time interval Δt a further ${}^{t}\Delta K$ tons are produced whose value is ${}^{h}\Delta K$ hours as specified by the equations (4) involving all producers of this commodity. The new market value of the commodity is then

(6)
$$\frac{{}^{h}K + {}^{h}\Delta K}{{}^{t}K + {}^{t}\Delta K}$$

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12 Summary

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