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MARX AFTER MARX OR, DO WE NEED A CREDIT THEORY OF EXPLOITATION?

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In fact, the seller of labour-power, like the seller of any other commodity, realises its exchange-value, and alienates its use-value. He cannot take the one without giving the other. The use-value of labour-power, in other words labour, belongs just as little to its seller as the use value of oil after it has been sold belongs to the dealer who sold it. The owner of the money has paid the value of a day's labour-power; he therefore has the use of it for a day, a day's labour belongs to him. On the one hand the daily sustenance of labour-power costs only half a day's labour, while on the other hand the very same labour-power can remain effective, can work, duringa whole day, and consequently the value which its use during one day creates is double what the capitalist pays for that use; this circumstance is a piece of good luck for the buyer, but by no means an injustice towards the seller. (MARX 1976:. 301)

1. Introduction

One of the more debated issues about Marxian theory is the relationship between vol. I and vol. III of *Capital*. Indeed, since the publication of vol. III, the thesis according to which there was a "contradiction" between the two books has been one of the favourite arguments of Marx's critics. The main point was, of course, Marx's supposed failure in the "transformation" of exchange values into prices of production. The charge has been repeated again and again in this century, beginning with Bortkiewicz and Dmitriev and ending with contemporary Neoclassicals as Samuelson or Neoricardians as Steedman. While Marx thought that exchange values were the necessary starting points in the deduction of prices of production, critics maintain that exchange values are redundant. Relative prices including a uniform rate of profit among industries may be reached directly from the the technological matrix and the real wage as the givens.

A second contradiction between the two books may be detected - a contradiction which has been little explored in the literature, as it is not so evident. What I am referring to is the notion of money which Marx puts forward in the first chapters of vol.I against the notion of money underlying vol. II and III. In vol. I, money is introduced as a money- "commodity" [the term money-commodity is used here instead of the habitual commodity-money to stress the gap between Marx from Ricardo on this topic], it is a product of labour: in those early chapters Marx's inquiry re gards a situation of general exchange of commodities from where money is deduced as the general equivalent. In vol. III, the cycle - or circuit - of capital has as its first step the financing of industrial capitalists's production by the monetary capitalists. A heterodox tradition in monetary thought, dating back to the beginning of the century and having as its leaders Wicksell, Schumpeter and Keynes, stated that the money opening the circuit of capital cannot have the nature of a commodity, rather that of a pure symbol. Nowadays, this sign-money is bank money created *ex nihilo*. However, even gold money of the good old days had to be interpreted, to quote Keynes' well-known dictum, as "a banknote printed on gold".

Since the 1970s, the first contradiction has produced an uninterrupted and unending flood of books and papers, mainly by Neoricardians, which all scrutinize *Marx after Sraffa*. The outcome has almost always been that the labour theory of value must be rejected. A divide runs between those who, like Garegnani, hold that giving up the labour theory of value does not damage Marx's conclusion, and those who, like Steedman, think that the theory in question is the basis of the whole edifice which, as a consequence of Sraffa's 1960 book, crumbles together with its faulty foundations, and must be rebuilt from scratch. Both however pass a negative judgement on the labour theory of value as a theory of exploitation (vol. I) - needless for Garegnani, wrong for Steedman - and as a theory of production prices (vol. III) happily get by Sraffa going beyond Marx's errors. On the other hand, the second contradiction has been underlined in the 1980s by those who, like the present writer, have suggested the utility to start reading *Marx after Schumpeter* - namely, embracing the credit theory of money we find spelled out in the *Theory of Economic Development*. According to this minority view, sign-money can be reconciled with the labour theory of value. But we must qualify this too, since other parallel monetary readings of Marx's *oeuvre* - while shifting the focus of attention from production prices to market prices, and hence reducing the emphasis on the first contradiction - end up claiming that the rejection of the commodity theory of money empties Marx's notion of exploitation of any meaning.

In the course of this paper I definitely will not establish what Marx "really" meant, as perhaps the title of this paper prompts the reader to believe. On the contrary, my point of departure is that Marx's project cannot be defended as it stands, and that the contradictions on which the critics have insisted are really there in *Capital* . What I want to show is that, in spite of the presence of some breaches in Marx's project, a"core" in his critique of political economy - which is also a critical political economy - can be picked out; and that holding this core firm Marx's progression from vol. I to vol. III can be reestablished on a sounder theoretical basis. The core is the labour theory of value as the theory of the *origin* of the capitalist surplus, *before* it being a theory of the determination of prices. This theory is strenghtened, rather than weakened, by the shift to a monetary theory of production where the cycle of capital is seen as a monetary sequence opened by bank finance, even if this move certainly compels us to revise some steps in Marx's original train of thought. I shall specifically insist on how a (bank) *credit theory of exploitation* allows us to regain the priority of exchange-values in the determination of prices of production for *methodological* reasons, thus paralleling Marx's approach to the transformation. The inquiry about how capital is *produced* must precede the inquiry about how capital *produces*. Exchange-values are the connecting link between the two levels of analysis. As we shall see, contrary to some "new approaches", this reading of Marx highlights how the rate of surplus in vol. I before the transformation is the same as the rate of surplus value in vol. III, but it is different from the (gross) profit/wage ratio after the transforma tion.

In this sense, we want to screen *Marx after Marx* .

2. The origin of the capitalist surplus

A good place to start is chapter 7 of *Capital*, vol I. The sale and purchase of labour-power is over, and we now enterinto the capitalist labour process as the scene where value and surplus value are created. To understand how the valorization process is going on, Marx follows a reasoning based on a counterfactual conditional. Since the matter is a controversial one, it is better to quote Marx at length here.

Marx shows us an amusing dialogue of "our would-be capit alist" with himself. The givens in the argument are the methods of production, the employment, the intensity and productive power of each worker, and the real wage.To begin with, imagine that the capitalist makes the wage-earners work just the time which is needed to reproduce their labour-power, including the replacement of the means of production. At this point,

"[o]ur capitalist - says Marx - stares in astonishment. *The value of the product is equal to the value of the capital advanced*. The value advanced has not been *valorized*, no *surplus-value* has been created, and consequently *money has not been* transformed into *capital*"(MARX 1976, p. 298). [In this quote and those following I've reintroduced the italics which are missing in the original English translation]. Two pages later he goes on: "The capitalist paid to the worker a value of 3 shillings, and the worker gave him back an exact equivalent in the value of 3 shillings he added to the cotton: he gave him value for value" (id., p. 300).

But the capitalist's surprise is short-lived: indeed, it was a joke. "Let us examine the matter more closely. The *value of a day's labour-power* amounts to 3 shillings, because on our assumption *half a day's labour* is objectified in that quantity of labour-power, i.e. because the means of subsistence required every day for the production of labour-power cost half a day's labour. But the past labour embodied in the labour-power and the living labour it can perform -the daily cost of maintaining labour-power and its daily expenditure in work - are two totally different things. The former determines the exchange-value of the labour-power, the latter its use-value. The fact that *half a day's labour* is necessary to keep the worker alive during 24 hours does not in any way prevent him to work *a whole day*. Therefore the *val ue* of labour-power, and the value which that labour-power *valorizes* in the labour process, are two entirely different magnitudes; and this *difference* was what the capitalist had in mind when he was purchasing the labour-power" (ibid) [a minor error of translation has been amended].

What matters here is the analytical distinction between labour and labour-power, the pivot of Marx's critique towards classical political economy. It is thanks to this distinction that the *origin* of the capitalist surplus - what elsewhere I've called the "originary" profits - may be explained: "[o]ur capitalist foresaw this situation, and that was the cause of his laughter. The worker therefore finds, in the workshop, the means of production necessary for working not just 6 but 12hours. [...] The trick has at last worked: *money has been transformed into capital*" (id., p. 301). The process of valorization "is nothing but the *continuation* of the [process of creating value] beyond a definite point. If the process is not carried beyond the point where the value paid by the capitalist for the labour-power is replaced by an exact *equivalent*, it is simply a process of creating value; but if it is continued *beyond that point*, it becomes a process of valorization" (id., p. 302).

In Marx's argument, we compare two very different outlooks. The *first* is an *imaginary* one - almost meaningless in actual capitalist terms, were not the outcome of a crisis - where living labour, i.e. the (potential) abstract labour embodied in the output, does not exceed necessary labour, i.e. (potential) abstract the labour embodied in the equivalent of the wage goods given over to the workers. It is a situation akin to Schumpeter's "circular flow", or to a Marxian simple reproduction where profits are reduced to the minimum given by wages of management entirely consumed. Properly speaking, profits are absent. Commodities exchange at relative ratios given by the exchange-values. Exchanges-value are here defined as the ratio of "simple" (or "direct") prices - namely, the money prices which would hold if the whole "net product" go to wages and no capitalist surplus is left over. Thus, commodities exchange in proportion of their embodied labour coefficients, the magnitude of value contained in each commodity, even if the composition of capital is different in the various branches of production. When Marx proceeds to the *second* term of the comparison, which corresponds to what *actually* happened in the current period's valorisation process - Marx examines the lengthening of the working day beyond the point where it should according to the first outlook. Living labour now surpasses "necessary labour" as the (potential) abstract labour *embodied* in "the means of subsistence required every day for the production of labour-power". As a consequence of surplus labour, a capitalist surplus sees the light of the day. Not to muddle up the inquiry of the *origin* of surplus value in the capitalist labour process with the inquiry over the *redistribution* of the surplus out of the industries where it was extracted, Marx sticks to the same relative prices proper to the circular flow. Hence, both the output and the inputs are for the moment computed starting from exchange-values, "attaching" simple prices to the various commodities.

An alternative way of looking at the matter is to say that since Marx's aim is to explain how the capitalist surplus is created, and hence to explain how the *capitalist* commodity is produced, he must necessarily start from the presupposition tha t the inputs entering the valorisation process are simple, *not yet* capitalist commodities. Not to confuse the production, with the sharing out of the capitalist surplus he must also hold fast to prices which do not include a rule of the redistribution of the surplus. It is crystal clear that this has nothing to do with the picture of a "simple commodity production" stage historically preceding the capitalist stage. It is rather a *logical* device Marx adopts to show why surplus value is nothing other than surplus labour. There is indeed a historical element behind Marx's argument, but it is not the one stressed by Engels' or by the " historical transformation problem" line as in Meek and others. It is rather the *sequential* nature of the capitalist monetary process within each period. But more on this later on. What is important now to understand is that Marx's comparison may be effected not only when absolute surplus value was first pumped out, but at the end of each capitalist monetary circuit - and that the counterfactual comparison compels us to go back to exchange values as the ruling prices.

The crucial role of the comparison we are referring to may be measured also by the central role it plays in Marx's critique of Ricardo in the *Theories of Surplus Value*, vol. II, ch. 15. In part A, sect. 2 called"surplus value". Marx writes: "The total working-day is *greater* than that part of the working-day which is required for the production of the wages. Why? That does not emerge [in Ricardo]. The *magnitude of the total working-day* is therefore wrongly assumed to be *fixed* [...] But it is equally obvious, that [if] with a given labour-time (a given length of the working-day) the productivity of labour [may be very different], on the other hand, with a given productivity of labour, the labour-time, the length of the working-day, may be very different. Furthermore, it is clear that though the existence of *surplus-labour* presupposes that the productivity of labour has reached a certain level, the mere *possibility* of this surplus-labour (i.e. the existence of that necessary minimum productivity of labour), does not in itself make it a *reality*. For this to occur, the labourer must first be *compelled* to work in excess of the [necessary] time, and this compulsion is exerted by capital." (MARX 1975, p. 406).

The passage quoted suggests that in each valorization process the mere possibility of surplus labour given by the level reached by the "presupposed" productive power of labour becomes a reality only through capitalist control, i.e. it must be realised through a "social" element, the *forced* and *other-directed* nature of the living labour of wage workers. We cannot pursue this thread here to show that in the Marxian argument, with

the real subsumption of labour to capital, the “technical” possibility of surplus labour is shown to depend on - to be the “ posit” of - the “social” condition of labour in the production process.

In vol. I, each firm is seen as just a fraction of capital in general. The pumping out of living labour in each capitalist labour process leads in the aggregate to a division of the social working day in two magnitudes: the necessary labour hidden behind the wage goods which are made available to the working class, and the surplus labour hidden behind what we may call profit goods, i.e. the capital goods or the consumption goods taken over by the capitalist class. This macro social sharing of the current “value added” by workers is accurately reflected in the rate of surplus value as the ratio of the simple price of profit goods over the simple price of wage goods - that is, in the ratio of the surplus labour *embodied* in profit goods over the necessary labour embodied in wage goods which is the outcome of *production*.

3. The value of money and the value of labour-power

It looks like quite a clear-cut argument. It isn't. I have omitted essential elements in Marx's approach. So let us then complete the picture.

The first qualifications touch on the unproblematic identity between embodied labour coefficients and magnitudes of value we posed before. The problems here are two. The first is that the living labour of the wage workers, before exchange, is only a potential value. At the beginning of *Capital*, when the analysis is still limited to the “presupposition” of a general exchange of commodities, abstract labour is private labour *becoming* social labour on the market. When the unfolding of the argument clears up that exchange may be general only with capital, the private labours externally connected in actual exchange are shown not be the labours of private independent producers but the labours organised by capitalist firms. The capitalist organisation of production marks out abstract labour as a “bet” on sociality made by the individual industrial capitalist, a *pre-commensuration* of labour in advance of final exchange which in its turn has to be *pre-validated* by the monetary capitalist in advance of production. That bet, of course, has to be submitted to the further, eventual, validation of the commodity market. Not only does the labour time spent in production count in so far as it is the “socially necessary labour time” for the production of use values: it must also correspond to the social need. Marx assumes all along vol. I - and for much of the other two volumes (including the transformation problem) - that the potential value in production will be really “actualised” in exchange. In the light of this restrictive hypothesis - not so far from Keynes' definition of the point of effective demand, where aggregate supply matches aggregate demand: the goods' market is in equilibrium, though the labour market may be not - we are justified in confining the valorization process entirely within the borders of production. On the basis of this hypothesis, and for the sake of brevity, in the following I'll use abstract labour instead of (potential) abstract labour when referring to the living labour of the wage worker in the sphere of production.

The second problem still concerns the unity of production and circulation. Again in the first chapters of *Capital* before introducing capital in the picture, when abstract labour turns into social labour, this metamorphosis is not effected through the direct exchange of the commodity against other commodities, but through the indirect exchange of the commodity with money as the general equivalent. Money here is considered as a very “special” commodity. Once more, it is important to quote Marx's own words at this stage: “*[p]roducts of labour* would not become commodities, were they not products of separate *private labours*, carried on indipendently of one another. The *social interconnection* of these private labours exists materially, insofar as they are *members of a* [*natural-spontaneous*] *social division* of labour and hence, through their products, satisfy wants of different kind, in the totality of which the similarly [*n atural-spontaneous*] *system of social wants* consists. This *material* social interconnection of private labours carried on independently of one another is however only *mediated* and hence is realised only through the *exchange* of their products. The product of private labour hence *only* has *social form* insofar as it has *value-form* and hence the *form of exchangeabili ty* with other products of labour. It has *immediately social form* insofar as its own bodily or natural form is *at the same time* the form of its exchangeability with other commodities or *counts as value-form for other commodities*. However, as we have seen, this only takes place for a product of labour when, through the *value relation of other commodities to it*, it is in *equival ent-form* or, with respect to other commodities, plays *the role of equivalent* “(MARX 1978, p. 140, italics in the text).

Gold as the “product of labour” which plays the role of the universal equivalent “counts as the value-form for other commodities”, and hence it “has immediately social form”. Thus, the definite, useful, concrete labour producing gold is social labour *without the mediation of exchange*. The inner opposition between use-value and value within the commodity develops into an *external* opposition: the equivalent-commodity counts as value-form, the shape of exchange value, while the other commodity counts as the shape of use value. As a consequence, the *concrete* labour producing the money-commodity is immediately not private but social labour: it is *the form of actualisation of abstract labour*. Gold as money is a commodity in the sense of being produced by labour. It is not a commodity in the sense of “having” value (though Marx often uses this expression). Value is private labour validated in exchange, whereas money does not need to be validated almost by definition: rather, money as the *material* symbol of abstract labour “represents” value in its own “bodily or natural” form.

Major consequences follow from this view of value and money. The magnitude of (potential) value within a commodity can be traced back to “embodied” labour *merely as a share of the labour producing the money-commodity*. On the market, the *monetary expression of value* tells us how many units of money, and hence of *directly social* labour, a unit of (*private, indirectly social*) labour time spent in producing the commodities is able to buy. It is the sum of prices divided by the labour time pumped out in production. In the previous section, since relative prices were equal to exchange-values, the monetary expression of value was unity. The same, of course, is true for the whole of vol. I. The *value of money*, then, is the amount of (*directly social*) labour embodied in the production of the money-commodity. Because of the assumption that private, indirectly social labours are validated in exchange running throughout most of *Capital* the value of money is just the reciprocal of the monetary expression of value. Thus, a unit of money (more precisely, the amount of abstract labour producing a unit of money) represents a unit of labour embodiedin the commodity. This allows Marx to translate labour embodied in commodities into observable money magnitudes in the market (as the quotes in sect. 2 make clear).

Marx's commodity theory of money is relevant also to fully understand his notion of *value of labour-power* in vol. I. Marx is well aware that the wage is paid in *money* by the capitalist to the worker before entering production, and that the latter has to wait after the end of production until he will spend the wage on the commodity market to eventually know the *real* wage. The labour embodied in the real consumption basket of the worker is, therefore, unidentified *before* the valorization process. Marx, however, claims the opposite: the owner of money, he stresses, has *already* paid the value of labour-power on the labour market. Marx is quite right in taking this position in its own terms. Variable capital is money-capital which may be thought as gold, that is to an amount of (*directly social*) labour *embodied* which is *given* before the valorisation process. If the real wage is at the "subsistence" level - a level which is determined by "historical and moral elements", hence by class conflict - the labour embodied in the gold buying labour-power at the beginning corresponds to a given amount of the abstract labour embodied in the wage goods bought by the worker. There is a bijective mapping between the money *equivalent* of labour-power and the value of labour-power, both being reducible to embodied labours.

To summarise, Marx's counterfactual comparison appears to have this structure: (i) at the beginning of the circuit the " would-be" capitalist advances the value of labour-power in money, which corresponds to the value of labour-power because the capitalist class will in fact supply on the market at the end of the circuit the subsistence wages the working class deserves and expects; (ii) if labourers' work last until their living labour reaches the necessary labour embodied in the gold advanced, the owner of money would not become a capitalist; exchange values would be the ruling prices; (iii) the " would-be" capitalist is actually a smart capitalist: he compelled workers to a living labour exceeding the necessary labour embodied in the gold advanced, hence to a surplus abstract labour; (iv) when the capitalist goes to the commodity market, he gets back a larger sum of money, hence a larger amount of labour embodied in gold as the general equivalent: the surplus value is nothing other than the "surplus labour" contained in the extra money, and corresponds to a certain amount of actualised abstract labour coming from production; (v) the real wage gained by the worker after production is equal to the value which the " special" commodity labour-power deserves in this mode of production because it is the labour time needed to the production and reproduction of this specific article: a value which, according to Marx, in a given country and in a given period is a *datum*. Beware of the causality chain: the value of money is *given* at the beginning of the circuit; it is because the value of money is *already* given that variable capital may be expressed *both* in labour and in money *before* production, and that the living labour of the wage workers may be expressed *both* in labour and in money *before* the final exchange on the commodity market.

Two objections may be raised against this train of thought. Let's start from the end. The correspondance of the labour embodied in the money-commodity with the labour embodied in the consumption bundle of the wage worker we mapped in the previous argument is of course valid only within "equal exchange" - namely, with relative prices proportional to exchange-values, or with money prices at simple prices. When production prices diverging from simple prices emerge, the labour *bought* on the commodity market by the money wage paid in gold and the labour *embodied* in the production of wage goods will not, in general, match anymore. Here we come up against a consequence of the first contradiction we recalled in sect. 1: I shall return on it in the next section. The other charge goes to the heart of the matter: can money be coherently depicted as a product of labour, as a " special" commodity, in a monetary production economy like Marx's capitalism?

My answer is negative. In a monetary economy based on wage labour, the production both of consumption goods and of capital goods must be financed with money. The *sequence* is *opened* by the exchange between capital and labour on the *labour market*: firms buy the labour-power they need in view of the output they plan to sell after production. The dealing between firms and workers is a standard labor contract in money, and the general means of payment to firms to fulfill their obligaton is provided by the banking system. *Production* is the *intermediate* step and it *takes time*: for the sake of simplicity, I assume that production begins at the same moment and lasts one period for each firm. After production, at the *closing* of the circuit, the *commodity market* is opened. The total or part of the consumption goods are sold to the workers against their money wage, whereas the rest of the output remains inside the firm sector either as capital goods for productive use or consumption goods for personal use.

Thus, in a closed economy, *initial finance* from banks is necessary to firms to acquire labour-power and intermediate goods - the expenditure for intermediate goods disappears in the aggregate for firms as a whole, and the initial finance needed by the capitalist class reduce to the *wage bill*. If money would be the outcome of a production process - the "gold producer" - where should the money financing the production of the money-commodity come from? This question - along with the other related one: i.e. where should the extra-money paying for surplus value come from? - was posed by Rosa Luxemburg, with her good theoretical insight. She however lost her way in the fog of the gold producer on the former question, and gave only a partial and incorrect answer to the latter question referring to the money coming into the commodity market from "external" sources. As Schumpeter clearly saw, and Wicksell before him, the problem can be satisfactorily answered only if finance to production means bank loans created *ad hoc*, with money interpreted as a *pure symbol*.

The second contradiction recalled in sect. 1 reappears once again. If money has no labour content, then the Marxian notion of exploitation gets in trouble. It is indeed impossible to establish the labour counterpart of variable capital as an advance of money *before production*, and to calculate *before final exchange* the amount of the surplus labour embodied in the extra money the firm is struggling for (the same notion of this extra money becomes indeed very dubious, for reasons I shall not go into out now). From production we only know living labour as indirect social labour: to have the division of the social working day we have to wait until(gross) profits and wages are spent on the commodity market. In an inconvertible paper money system, the value of money and the value of labour-power will be fixed only at the end of the monetary circuit. Marx's chain of causality collapses.

4. The transformation of exchange-values into prices of production: another interpretation.

I don't think that replacing Marx's money-commodity with a credit theory of money gives such negative results. Before trying to solve the second contradiction, however, we need to deal with the first one: namely, the claim put forward by Neoclassicals and Neoricardians alike that the shift from "equal exchange" to "unequalexchange "

dissolves the labour theory of value. In this section, I intend to show how the transformation can be seen as the *consequential logical development* in vol. III of the theory of value interpreted as the theory of the origin of the capitalist surplus coming from vol. I; and that a reappraisal of the transformation a century later through the eyes of Marx, disprove both the critics' and the fundamentalists' position. In the following section, I'll refer to the so-called “new solution”, underlining how their definitions of the value of money and of the value of labour-power break with crucial points in Marx's argument. Then, in sect. 6, I'll return to the issue of exploitation within the capitalist monetary sequence, to discuss to what extent the notion of surplus labour as the ground of the capitalist surplus is fully confirmed by the theory of the monetary circuit, with a logical and historical *prior* determination of the rate of surplus value relative to the rate of profits. Finally, in sect. 7, I'll propose some preliminary thoughts on the issue raised by the method used by Marx.

Let us go back to the argument which Marx uses to explain the birth of the capitalist surplus from surplus labour. In the *logical* order of that argument, capital cannot be presupposed to himself. As the counterfactual comparison shows, Marx has to start from a situation where surplus value is assumed away. At the same time, in the *historical* sequence of the capitalist process the metamorphosis between labour and capital on the labour market precedes the production of capitalist commodities to be sold on the market. Therefore, the exchange on the labour market *constitutes* the capitalist process in a double meaning. Being introduced before capital is explained, the inputs for the valorisation process have to be considered as *mere* commodities, and this affects also the valuation of the wage goods which make up the subsistence, those wage goods which determine the value of the labour-power at the beginning of the circuit. Commodities may be deduced as *capitalist* commodities only *after* exchange on the labour market: it is as a *consequence* of the *double* social relationship in the labour market *and* in the capitalist labour process that capital is *produced*; the former alone is not enough, a consideration of the latter is essential. To have capital *as the output*, then, let me emphasize it, the inputs bought by money capital have yet to be conceived as *not* capitalist commodities.

This two-step argument in vol. I is prolonged in the two-step transformation Marx suggests in vol. III. In vol. I relative prices were equal to exchange-values, and money prices to simple prices: because these were the prices proper to the imaginary situation of”circular flow”, i.e. of the first side of the comparison; and because when the ideal lenghtening of working time gave way to surplus value, i.e. to the second side of the comparison which was nothing other than the actual situation, surplus value was not immediately redistributed to individual industries - we were still at the level of *capital in general*. When we go on to the analysis of *many capitals*, we need to take into account that the individual capitalist is interested in the ratio between the excess in the value of the product over the capital advanced, and that a tendency towards the formation and equalization of the *profit rate* is immanently built-in to the abstract nature of capitalist wealth. Our inquiry must then deal with the issue of the determination of relative prices which allow for an equal rate of profit, and of money prices as production prices; and to ask if those relative prices (which in general differ from exchange-values) and those production prices (which in general will differ from simple prices) are compatible with the labour theory of value.

The deduction of prices of production is in Marx effected once again through a *mediation* which, first of all, aims at explaining the formation of the category in question, the average rate of p rofit, and afterwards look at the feedbacks of the new category on the theoretical building. The *formation* of the average rate of profit is tackled by Marx in strict continuity with the first two-step comparison in vol. I. He indeed starts by asking how prices of the capitalist *output* allowing for the average rate of profit are determined. Since in vol. I the inputs had to be accounted for as mere commodities when explaining the origin of surplus value, to construe the average rate Marx begins by connecting the surplus value with the capital advanced, the numerator and the denominator being computed in simple prices. This is the rate of profit as it is introduced in ch. 9. Through the application of this average rate of profit to the advanced capital computed at simple prices Marx reaches for the first time a capitalist price for the= output. Thus, the same commodity has a *double exchange-ratio*: it is valued at simple prices when it is looked at as (not yet capitalist) input, and at production prices when it is looked at as (already capitalist) output. To examine the *feedbacks* we should subsequently apply the capitalist price of the output to the inputs, as Marx himself suggests. If we iterate the procedure, we reach the Sraffian simultaneous solution for a reproduction “equilibriumblquote where relative prices which include a uniform profit rate reestablish the originary distribution of the commodities. Now the inputs' prices and of the outputs' prices are the same.

Before further comment on Marx after Sraffa, let me stress that here we have another counterfactual comparison. The *first* step of this second comparison, where the rate of profit ˆ *la* Marx and the prices of the capitalist output are set, is another *imaginary* construction, whose function is merely to provide a bridge between the first counterfactual comparison, which discovers surplus labour behind the capitalist surplus, to the *second* step of the second comparison, which “extends” the transformation to the inputs. It is possible in this way to *isolate* the object of analysis of vol. I, the production of surplus value (the origin of the capitalist surplus), without *severing the links* with the redistribution of the surplus in circulation (the determination of production prices).

Thus, the *method* by which Marx tackles the problem is such that we move *sequentially* along two routes, whose order we now know cannot be reversed. We begin with an argument which traces back capital to labour: it is a *linear*, one-way road. Labour *originates* capital because capital compels the labour-power to work more than necessary labour. Capital here is the outcome of the argument, not its starting point. It is then quite justified that theory recognizes the logical - and, in a sense, also historical - priority of labour over capital, and therefore that inputs are not immediately taken to be capitalist commodities: hence, the first valuation of the elements of constant and variable capital at simple prices. In this view, the determination of the rate of profit in the way Marx accomplish it in vol. III is quite straitghtforward. Subsequently, we must include the means of subsistence as well as the other inputs as also outputs of capital's *circular* process. Once the “orig inary”profits have seen the light, and the formation of the uniform rate of profit has been accounted for, prices of production and the equal rate of profits must be *simultaneously* determined on the commodity market, at the end of the circuit.

This methodical sequentiality is fundamental to Marx. The rate of profits of the simultaneous solution would be meaningless if it were not grounded in the dynamics of

producton as the valorization process, through the “imaginary” rate of profits of ch. 9. This point has been totally overlooked by the Neoricardians. So, where's the problem for the Fundamentalists? The problem is that to Marx it was not at all clear that the rate of profit as he computed it in ch. 9 was an “imaginary” one, e.g. that it was *different* from the one reached iterating his procedure and converging to the simultaneous solution. He rather seems to assume that the two will eventually be the same. Moreover, contrary to Marx's strictures, after Seton and Sraffa we know that production prices can be set *directly* without starting from exchange-values: an accounting of the conditions of production at simple prices is redundant - in the precise sense that the last stage of the deduction of the prices of production *cancel* the traces of all the previous steps. Finally, the simultaneous solution cannot confirm in one stroke the two phamous equalities - between the total value added in “prices” and in “ values”, and between (gross) profits and surplus value - by which Marx intended to show that “price” changes merely redistribute “value” magnitudes, and that the total of(gross) profits was merely the phenomenal form of the total of surplus labour. According to Marx, not only should the rate of profit before and after the “correction” about the inputs have been the same: but also the rate of surplus value and the (gross) profits/wage ratio should have been equal.

This last charge has been countered by the “new interpre tation” proposed by Duménil and Foley (henceforward: DF). Now I would like to take a closer look at the latter.

5. The transformation: the “new interpretation “

We saw in sect. 3 that Marx's argument in vol. I was framed in a monetary sequence economy, where money was understood as a money-commodity. Before going into detail about DF's way of dealing with the transformation of simple prices into prices of production, it may be helpful to sketch how consideration of the monetary nature of Marx's first comparison affects the issue.

If we move from “equal” to “ unequal” exchange - that is, if prices diverge from simple prices - after the transformation, an hour of labour embodied in the money commodity (i.e., an hour of directly social labour) *buys* in exchange a different magnitude of abstract labour (i.e., a different amount of indirectly social labour) than before, and viceversa. The two definitions of the value of labour-power given by Marx in vol. I - the labour *bought* in exchange by the *given* amount of the general equivalent and the labour *embodied* in production in the *given* amount of the means of subsistence - become contradictory. It is, of course, quite meaningful to say that in both schemes there *is* an amount of labour contained *both* in the money commodity *and* in the wage goods bought by the workers. But we reach different results in the transformation if both the former or the latter are held constant.

We are indeed compelled to make a choice: either, as in the new interpretation,we take as given the variable capital i*n money* (i.e., the hours of labour embodied in the money-commodity which buys the labour-power), or, as in the old simultaneist tradition, we take as given the *elements* of variable capital (i.e., the hours of labour embodied in the production of the wage goods the worker is able to buy). If we assume that finance to production is unchanged from the “price” to the “value” scheme, and if prices of production are higher (lower) than simple prices, the amount of commodities bought by a given money wage will be lower (higher) after the transformation. The necessary labour embodied in the means of subsistence will then be known only after the tranformation or, if you like, the real wage now becomes anendogenous variable. In other terms, taking this route the hours of labour embodied in the money commodity are the datum in the transformation, whereas the hours of labour embodied in the production of the wage goods the worker is able to buy are a function of the purchasing power of the money commodity at the new prices. If we rather stick to the real wage as the exogenous variable, the hours of labour embodied in the production of the wagegoods the worker is able to buy are taken as the datum in the transformation, since the wage bundle is the given, and the amount of money advanced as variable capital must then be adjusted to allow the workers to buy the wage bundle in both schemes.

DF's new interpretation is in a sense a generalisation of the first route, the one which takes the money wage as the given, to a situation where money may not happen to be a product of labour. In their solution, the *normalisation constraint* is that the value added by actual living labour remain the same both in “values” and in “prices”. The sum of variable capital and surplus value is therefore, by definition, identical to the sum of (gross) profits and wages in money. What is essential to Marx, it is argued, is that the value added exactly represents (indirectly) social labour time - a point on which, by the way, I fully agree. To express this view, the equation where living labour is set equal to the price of the “ net product” takes the place of vol. III equality between total “ values” and total “prices”. The *value of labour-power* is here meant to be the *labour time equivalent of the money wage*. We then need to know the *value of money* to know the value of labour-power. Since money is not a commodity, the value of money has no relation whatever with any notion of labour embodied in the general equivalent, as it was in Marx. The value of money is now simply *the amount of (indirectly) social labour time a unit of money represents*, a magnitude which is indeed nothing more than the ratio of living labour over the value added in “prices”. This means two things: that the value of money in this approach is set only *at the end* of the monetary circuit, when the “net product” meets the demand for commodities (consumptiongoods and new capital goods) deriving from money income (wages and profits); and that the forementioned normalisation constraint holds the value of money constant in DF.

At this point we are able to decipher the value of labour-power as the *money wage multiplied by the value of money*. It is the amount of (indirectly) social labour time bought by the money wage or, which is the same thing, *the share of the value added going to wages*. Since *surplus value* is *value added less the value of labour-power*, surplus value is *just another name for (gross) profits*. Surplus value is *unpaid labour time*: not, to be sure, the labour time embodied in what is left of “net product” after a given subsistence is granted to worker; rather, the labour time *bought* by nominal profits in exchange, *the share of living labour which= does not go back to workers through the expenditure of their wages*. According to this approach, the equality between (gross) profits and surplus value is said to confirm another essential claim of Marx's - a point which follows directly from the definitions used and on which, by the way, I disagree as a fair interpretation of the core of Marx's theoretical project.

The “new interpretation” has been a tremendous advance in Marxian economics. It breaks, however, with Marx's chain of causality. The value of money and the value of labour-power are not anymore given before the production process. Moreover, surplus value (as an amount of abtract labour) and the rate of surplus value (as the ratio of surplus abstract labour over necessary abstract labour) are not determined before the

profit rate resulting from the transformation, and before the exchange on the commodity market anymore. The supporters of the “new interpre tation” may retort that the approach they follow is compulsory, once we recognize that money may not be a commodity and that with “unequal exchange” the dual definitions of the value of labour-power present in vol. I cannot be held together. I would like to prove the opposite in the next section.

6. Transformation in a sequence monetary economy.

Let us go back to Rosa Luxemburg's fundamental question: where does money *enter* the capitalist process from? This issue is still embarrasing for “bourgeouis” general equilibrium theory, as the debate running down from Patinkin to Arrow-Debreu-Hahn to Clower shows very clearly. It also seems neglected in recent Marxian thought, as the exclusive and prior focus on money as a measure of value and means of exchange confirms. Money is always thought of as being *already* there.

I have implicitly given a possible answer at the end of sec. 3. Money comes in through banks' initial *finance to capitalist production*. Thanks to their priviliged access to money capital lent by banks, industrial capitalists hold a power over the determination of the level and composition of output. The capitalist class decide how many workers to employ, and where to allocate them. In this *macrosocial* view, once firms as a whole have (unconsiously) chosen the share of the total labour-power going to produce wage goods and the share going to produce profit goods, the real consumption of the working class is set. At the beginning of the monetary sequence, money capital, though valueless, is nevertheless a *command over workers' labour time*. The value of money in this first step of the monetary circuit is the number of workers a unit of bank finance is able to buy. Given the methods of production and the productive power per worker, the length and intensity of the working day, and employment, we also know the living labour pumped out from these workers. I suggest calling value of money as *capital* the ratio of living labour over the wage bill (variable capital in money). From aggregate production we can also establish the abstract labour embodied both in the profit goods and in the wage goods produced according to firms' decisions.

All this happens *before*, and *irrespective* of, any transformation of simple prices into prices of production, simply because the transformation problem “opens up” after the conditions of production - the inputs and outputs - are set. The trasformation problem is entirely placed at the level of *dead* labour, while the command of money capital affects *living* labour. The reference to living labour is necessary for Marx to explain how in capitalism, as the monetary economy *par excellence*, the surplus is extracted from workers'. In this view, the given in the tranformation issue should be the aggregate *real* wage. Of course, workers' real wage will be known only *post factum*, on the commodity market. We may, as Marx did, proceed on the assumption that firms as a whole let the workers take the aggregate subsistence wage bundle, in which a certain amount of abstract labour time is embodied during its production (this I would suggest calling the *value* of labour-power); and we may then follow Marx in treating the value of labour-power as given before the production process “in a given country at a given period”. Or we may consider the possibility that firms as a whole fix an aggregate real wage different from the subsistence, in which a different amount of abstract labour is embodied during its production (this I suggest calling the *price* of labour-power). The necessary labour for the working class is the labour embodied in the wage goods *actually* consumed by workers. With the price equal to the value of labour-power, necessary labour is just the labour *embodied* in the subsistence: “[t]he value of labour-power can be= resolved into the value of a definite quantity of the means of subsistencerdblquote , i.e. “the quantity of labour-time required to produce them” (MARX 1976, p. 276). Hence, we now know the rate of surplus value for the capitalist process as a whole as the ratio of surplus labour embodied in the production of profit goods over the necessary labour embodied in the production of wage goods; and we know this rate *prior to* production prices and the rate of profits. This rate of surplus value is computed according to a definition of the value of labour-power at”values”.

When we go on to determining the prices of production, we must take into account what happens to the value of money as capital, and to the value of labour-power. Let me start with the latter. The conditions of production (the level and composition of output, and the inputs) and the real wage are the givens of the problem. With production prices different from simple prices, to let workers consume the same wage bundle the value of labour-power has to be *re-evalued* at the new prices. This means that the wage bill (variable capital in money) has to change across the two schemes: if the price of production of wage goods is higher (lower) than their simple price, the wage bill will increase (decrease). We are indeed imagining that banks' initial finance is going up (down). Since the wage bill is the denominator of the value of money as capital, and since living labour, the numerator, is unchanged, the value of money as capital in the “ price” scheme is lower (higher) after the transformation. It seems strange, but it is not: in point of fact, we are holding the *purchasing power* of initial finance in terms of living labour in the transformation constant - that is, money capital's command over labour time, the key point of the capital-labour social relationship. Note that we now have a new category: the *transformed* value (or, mutatis mutandis, the *transformed* price) of labour-power, e.g. the real wage accounted in “ prices” - the equivalent in our argument of DF's value of labour power.

Let me insist on the point. Wage workers sell their labour-power against the money wage (variable capital in money). There is then a certain sum of money the working class will spend on the commodity market. I accept the normalisation constraint of the “new interpretation”, and then I must also have the constancy of the value of money *spent as income*. However I give a *double* valuation of labour-power - first in a “value” accounting framework, then at a”price” accounting frramework. Why? With the former valuation I obtain the (macro) rate ofsurplus value as the ratio between the abstract labour embodied in the production of profit goods over the abstract labour embodied in the production of wage goods. With the latter valuation I get the (gross) profit/wage ratio as the ratio between the abstract labour represented in the money buying the profit goods over the labour represented in the money buying the wage goods. The meaning is quite clear. When wage goods are sold at the end of the circuit, they gain an amount of (indirect) social labour expressed by the wage bill *after the transformation* multiplied by the value of money as income. Since exchange is “ unequal”, this amount is divergent from the abstract labour embodied in the production of those wage goods themselves - which may be also resolved in the amount of (indirect) social labour expressed by the wage bill *before the transformation* multiplied by the same value of money.

The value of labour-power in “prices” is of course that corresponding to the *actual* wage bill paid by firms, whereas the wage bill in “values” is in a sense *imaginary*

because it does not correspond to what is really variable capital in money. However, the latter reveals what is obscured by the former, the *division of the social working day among classes*. In this other sense, the wage bill in"values" rather than being imaginary is truer to reality than the wage bill in "prices". It is the end-result of class struggle in the valorization prices, which is hidden behind the circulation and distribution of commodities.

What about the relationship between this interpretation of the transformation and Marx's own approach? Here I want to stress the elements of *continuity*. On the view I am proposing here, the argument in "values" is fundamental because it gives an *explanation* of how the capitalist surplus stems from a *prolongation* of labour over the necessary labour embodied in the *production* of wage goods, as in vol. I. The transformation of simple prices production prices means that the sole external input for firm as a whole, labour-power, has to be valued according to a *double* exchange ratio in this model to get the phenomenal (gross) profits/wage ratio without losing sight of class relations in production, just as the commodities making up constant and variable capital are valued according to a double exchange ratio in vol. III. The *logical* priority of the macro analysis of the pumping out of labour and surplus labour over the micro determination of prices - linked as it is to the *historical* sequence within the monetarycircuit from finance (labour-power) to production (living labour) to exchange (dead labour) - is what I see as the "core" of Marxian value theory: a core which is fully respected in the alternative perspective I am proposing. What is lost is the neat correspondence between the rate of surplus value in the class economy as a whole and the rate of surplus value in each valorization process which is proper of Marx's argument, since the latter changes if, within the given aggregate wage bundle, we allow the workers freedom to choose their personal consumption basket.

Neoricardians and Fundamentalist alike may retort that the eventual shape of the transformation in my view is, once again, the simultaneous solution - the one the formers love and the latters hate. So what? The determination of prices on the commodity market *is* simultaneous. Value theory was for Marx *also* a theory of the determination of prices: but this is a *secondary* aspect, the *fundamental* being value theory as the theory of the *origin* of the capitalist surplus. The fact that the last stage in the transformation cancels the previous one was surely not intended by Marx. But is it not a spectacular corroboration of Marx's theory of fetishim that there's no trace of the reification process in the reified, so that we have the picture of a "production of commodities by means of commoditiesdblquote ? That capital as a *circular* process, where current labour is already *dead* in the "things" and *included* as the "means of subsistence", *conceals* capital as the *linear* process where *living* labour *produces* the originary profits and hence capital itself?

7. Preliminary notes on method

I remarked some time ago, in a paper with Roberto Finelli, that Marx's method is best understood referring to Hegel's "posit of the presupposition". The point is relevant also here. Marx's four-step procedure, from the origin of the capitalist surplus to the trasformation issue, is just the unfolding of an analysis which must start from certain presuppositions: the commodity in the deduction of the general equivalent and in the first comparison; the valuation of inputs at simple prices in the second comparison leading to the determination of the prices of production. Marx in due course has to posit these presuppositions, so that the commodity of the first chapters in *Capital* reveals itself to be a capitalist commodity, and that the valuation of inputs must be eventually made at prices which in general differ from simple prices. In my opinion, Marx did not take fully into account the modifications a coherent development of his approach required on his starting points. Hence, the two contradictions. When exchange as such is shown to be an exchange following capitalist production - that is, *capitalist* exchange - money could no longer be seen as a commodity, though a very "special" one. When the inputs are re-evalued, the equality between surplus value and (gross) profits could not be taken for granted anymore.

The contradictions Marx stumbled upon may be ascribed to the fact that Marx himself was not faithful enough to the novelty of his approach to capital. Capital is abstract wealth, indifferent to the concrete use values where it finds only a temporary external shape. This way an *ontological difference* is introduced in the world under discussion: a *doubling* of worlds, the world of Absolute Being and the world of determinate and individual being. On the one hand, the unantropomorphous world of abstract wealth and its never ending accumulation; on the other hand, the antromorphous world ofuse values and human needs. The latter has no true autonomy, because in fact it is merely the material support of the former, while concealing and distorting it - more than that: while presenting itself as the only reality. Which indeed is what happens inthe transformation as reconstructed in the last section, with its double exchange ratio system (and its double valuation of labour-power) permitting to preserve Marx's progression from the command over labour, to the division of the social working day, tothe definition of a physical pattern of output, to the deceiving form of appearance in circulation/distribution - eventually dissolving any sign of the valorization process.

The notion of the money-commodity contradicts Marx's definition of capital as abstract wealth, because it fastens the universal nature of abstract wealth to the particular shape of a given use value. While Marx was justified in deducing the money-commodity from exchange as such, this deduction should have been revised when he pa ssed to capitalist exchange. The circumstance that Marx did not operate this revision is the crux of the problem also in the transformation. To give only one example: the dissociation of (gross) profits from surplus value after the transformation is evidentlydue to the fact that money *has not* an " average" composition of capital. The value of money as income is determined referring to the value added, the "net product", which of course has a different composition of capital than its quota given by the wage goods. Therefore, not surprising that the wage goods bought by money receives in exchange less current labour time than was actually needed for their production.

Marx avoids the problem thanks to the dubious escamotage of assuming in his model that the money commodity *does have* the "average" composition of capital. But Marx was well aware that an essential feature of capitalism is that the "external" measure of value *cannot be* the "invariable measure of value" Ricardo was searching for; hence, money by its nature *mis* represents the "immanent" measure of value, abstract labour time. We saw that the value of the elements of constant and variable capital has to be re-evalued during the transformation, because they are, firstly, the presuppositions in the inquiry about the origin of capital and, subsequently, the posit of the already constituted capital. It is quite natural, therefore, that this misrepresentation affects the external form of manifestation of the rate of surplus value, the rate which reflects the *essence* of the

social relations in production: an external form of manifestation which has to go through the actual money prices of profit goods and wage goods as the concrete use values where abstract wealth's accumulation has found a temporary pause.

Holding to the commodity theory of money Marx was in fact pretending to speak of the world of Absolute Being starting from an element of the world of determinate and individual instances of being. Abstract labour as the living labour of the wage worker is an inherently *dynamical* category. It is social labour "in becoming". It is, literally, at the *centre* of Marx's theoretical scene: the capitalist command over living labour *follows* banks' pre-validation of firms and *precedes* the market's eventual validation of the pre-commensuration made inside the capitalist labour processes. The credit theory of money is indeed coherent with Marx's characterisation of abstract wealth and of abstract labour. Bank money as sign money is an unavoidable choice when the commodity in exchange as such is posited as the commodity in capitalist exchange, and production must then be seen as financed by credit *ex novo*. At the same time, bank finance as the first move of the monetary production economy is the mark that in capitalism socialisation is a *process* which can never be fixed in a thing. A process whose hidden reality is the triangular hierarchical social relationship among banks, firms and workers *prior* to the eventual validation on the commodity market.

Patinkin's opening of *Money, Interest and Prices* appropriately characterises a monetary economy (though he soon forgets this starting point!): "Money buys goods, and goods do not buy money" (PATINKIN 1965, p. xxiii). The discourse on money proper to most of contemporary Marxism emphasises the role of money on the commodity market, or as store of value: it is still talking of "goods buying money" through exchange on the commodity market at the end of the monetary circuit. The credit theory of money, in asking where the money comes in from in the capitalist sequence, answers the question with a " money buying goods" at the opening of the monetary circuit, through the initial finance to capitalist production. Banks' financing set the stage for the capital/labour confrontation on valorization. If exploitation in production is the core of Marxian critique to political economy, as I do strongly believe, and if the cycle of the capitalist process is the sequential production of money by means of money, as the theory of the monetary circuit has convincigly argued, this seems the road to follow.

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WHAT CAN WE LEARN FROM MARX'S CRITICISM OF QUANTITY THEORIES OF MONEY?

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There is an ongoing discussion about value, prices and money in Marx's theory among Marxist economists. It does not often concern criticism of current themes, such as monetarism, nor topics under discussion today, Fiat money, international money, or floating rates of exchange. Returning to the criticism of quantity theories of money in Marx's writings, I intend to make use of it in dealing with these topics.

A number of quotations are presented here, from Marx's "Contribution to the critique of political [1859](1970) - here "Cr"; "Theories of surplus value" [1862-63] (1963), here "SV", and Capital volume 1, [1867] (1977) here K1 .

What matters here is following the process of Marx's thought, rather than stopping at the value-of-money problem. The theory of labour-value is the starting point, but not the only one, for criticizing the quantity theory of money. Otherwise it is difficult to understand Marx's criticism of Ricardo's theory of money and to introduce the Fiat money problem.

The present paper starts with a recapitulation of the labour-value theory of money (I) . Then it looks at the question of commodity circulation as a peculiar process of socialization (II) Afterwards it applies Marx's criticism of quantity theories to discussing present monetarist notions(III)

The subject of international-money is not tackled separately here. Some indications are given within the three parts of the paper. Others can be presented later.

I Money and the labour value theory

The starting point of Marx's theory of money is well known . "Gold can only measure the value of cotton if gold and cotton as values possess a common factor" - that is if both are produced by labour. Here Marx agrees with Ricardo. To begin with, Ricardo determines the value of gold and silver like the values of all other commodities, by the quantity of labour-time materialized in them The value of other commodities is measured in terms of the precious metals, which are commodities of a determined value"(Cr. 170)

However if we stop here, we cannot on one hand understand why Ricardo presented a quantity theory and Marx did not. Nor can we know why Marx wrote against "Ricardo's falsely conceived problem of an invariable measure of value"(SV 3,137) and why according to Marx "variability is precisely the character of value

On the other hand, we cannot understand why Marx criticizes the notion of a "labour money proposed by John Gray (A. Saad-Filho 1993). According to Marx, there is no "organization of exchange " without "organization of labour" . The circulation of commodities and money cannot be confused with social organization of labour and exchanges, whatever the banking system and the state's intervention may be.

These points are the first connection between adoption of the labour theory of money and rejection of the quantity theory . "Commodities enter circulation with a price, and money with value" . "Prices cannot be determined by the quantity of the circulating medium". In commodity circulation there cannot be "an aliquot part of the medley of

commodities exchanged for an aliquot part of the heap of precious metals" (K I 124). This is directed against Hume's quantity theory of money and the idea of use values exchange. Against Ricardo's quantity theory Marx goes further. He connects his value theory of money with forms and functions of money in the circulation process.

II The circulation process and socialization of commodities and money

The well known circulation process, C-M-C, (Commodities -Money-Commodities), combines two kinds of "socialization": "Private labour time contained in commodities becomes social labour time" . Money becomes "the standard of prices" fixed by legal means.

1. THE C-M-C PROCESS

Circulation of commodities presupposes "an advanced division of labour and therefore also a diversity of wants on the part of the individual (Cr 90). So it presupposes "an indefinite multitude of circuits" . Here "circuits" are different from the credit-money circuit where money lent by creditors comes back to them from debtors. settling their debts..

- C-M: The sale is a "metamorphosis" of a commodity into money, which involves a "transformation of private labour into social abstract labour" represented by money (D.Foley, 1986).

-C-C: There is no direct exchange of commodities, even if money is gold. And no barter as an exchange of use-values. Here Marx criticizes the quantity theory of money a la Hume

-C/M/C: There is separation and independence of the acts of purchase and sale. Marx criticizes Say's Law "The metaphysical equilibrium of purchases and sales is confined to the fact that every purchase is sale and every sale a purchase". Contrary to that, money can be hoarded into "reservoirs" , which regulates its flow. But hoarding can also disturb the circulation The separation between purchase and sale makes "monetary crises" possible.

The circulation process of commodities and money has contradictory features . Socialization of the private labour contained in commodities ,through C/M/C exchanges, is different from the social organization of production and circulation. Money is a specific constraint upon private exchanges of commodities produced by private labour.

2.MONEY, CURRENCY AND THE STATE

a) Within commodity circulation , the money's form cannot be a commodity as such. As a standard of prices within a country, it is a unit of account . Official coinage changes gold bullion into domestic coins. "Gold is minted according to the standard of the money of account.. Gold is a measure of value because its value is variable, it is the standard of prices because it has been established as an invariable unit of weight. Here...stability and exactitude of the proportions is essential"(Cr.72) . This transformation of money into currency occurs by "legal means", which involves "the power of the state, the concentrated and organised force of society" (KI 751). So "the designation of the unit of measure .15 on the one hand ,purely conventional, and on the other hand ,must be accepted as universal and indispensable within the sphere of circulation" (Cr. 72)

This is a second process of socialization, when money circulates as currency. Whatever the money form, metallic coin, or paper money, within a country money is coined or issued by the state according to a unit of account, x £ or x dollar being equal to y or z weight of gold. Now the value of gold is "given", and the amounts of means of circulation are determined by the prices of commodities (Cr 70). It means that when money becomes currency, the price of gold is fixed but its quantity is variable according to the exchanges needs. And there is no "equilibrium quantity " of money, within or outside a country , which is opposed to any quantity theory of money.

At the same time, money which circulates is thought to be a flow, not a stock. "The proportion of money in circulation to the total amount of money varies continuously (Cr 97). This too is opposed to quantity theories.

At the same time, money which circulates is thought to be a flow, not a stock. "The proportin of money in circlation to the total amount of money varies continuously" (Cr 97). This too is opposed in quantity theories.

b) Currency and "world money".

On "the world market", the shape of gold money is bullion , and not coins. Its value as a commodity depends on its costs of production (the labour time contained in it (Cr. 151). In Capital volume 3, Marx writes that "(t)he bullion trade itself{ the transfer of gold or silver from one country to another, is merely the result of trading in commodities. It is determined by the rate of exchange which expresses the standing of international payments and the interest rates in the different markets". (320). The international circulation of gold as bullion is different from the circulation of gold as currency coin s. Bullion is not a means of circulation, but only a means of purchase and payment between countries (Cr 1 50). The connection between these two circulations , international and domestic, is not clearly presented by Marx. But in both cases, there is no equilibrium quantity of money

Ricardo had an opposing view, for both currency and international movements of gold. Following Marx, Ricardo took into account "an international currency-equilibrium " .of gold distributed among countries. So within each country there is "a proper level" of gold , or an "equilibrium quantity " of gold supply. Marx disagrees with Ricardo's quantity theory of money. Whatever the sphere of circulation, between countries or within each of them, there is no equilibrium stock of money. And within a country, the unit of account is fixed by the state, but the quantity of money is not.

c) Marx leaves aside the ricardian problem of "an invariable measure of value" "Variability is precisely the characteristic of value" so that when gold's value rises or falls, the sum of the prices of commodities falls or rises ,and so does the quantity of money that circulates (K 1 11 7).But the value of money as a means of circulation is considered to be given, "as in fact it is momentarily whenever we consider the price of a commodity. On this supposition, then, the quantity of the medium of circulation is determined by the sum of the prices that have to be realised" (id.).

So the traditional quantity equation, M.V. -P.Q. , is disconnected from the quantity theory of money (Foley,1986). "The quantity of the circulating medium is determined by the sum of the prices of the commodities circulating, and the average velocity of currency" (K. T 123). This quantity equation has a second expression, when credit is included and money functions as a means of payment In both cases, M, the quantity of

money as a flow, is determined by P.Q the amount Q of transactions with given prices of commodities, P.Q, V being given .This is the reverse of the quantity equation in the quantity theory of money in which a change of M (stock) has an effect upon prices P (V and Q being given). In Marx's quantity equation, an increase in the quantity of money is not equivalent to a change in the monetary unit :the value of money does not depend on its quantity

3. TWO PROBLEMS OF THE CIRCULATION PROCESS

a) The time problem

Any process , including what Marx calls “the social metabolic process of circulation”. takes time. But not all “phases” or “stages” distinguished by Marx are “historical” time processes.

First, the process of circulation “presupposes that the value of gold is already given in the prices of commodities”. Otherwise, “the relation of gold and commodities would be that of direct barter “(Cr 90). So the transformation of gold into money is “antecedent to circulation”.But that transformation is also considered as “the first phase of circulation”: then it is “a theoretical phase preparing to real circulation” (Cr. 64). And the simultaneity of prices' and of gold money;s determination, is a precondition for understanding the structure of monetary exchanges, and the “real” C-M-C circulation.

Second, within C-M-C circulation, there are numerous and ceaseless transformation processes . As “the labour time contained in commodities is not immediately social labour time” C-M-C involves some qualitative transformation of commodities into money . Where money is concerned , the measure of value “becomes “ the standard or prices, money “becomes” currency within a country, and so on. But these processes are not really sequential, occurring in some historical time. The scope for transformation depends on the monetary structure of commodity circulation . There is “logical” rather than “historical” time. “Transformations” are mediations belonging to the structure of exchanges “Simultaneous” and “sequential” processes should be thought together, though they are different.

In the same way, when Marx comments on C-M, i.e. sale, he writes that that “sale is simultaneously a purchase, M-C” . But it is also an “independent isolated transaction” So “there is both unity and separation of purchase and sale” (Cr 94). Marx considers that Say's law is senseless.

b) The aggregate problem

M.Friedman (1987) calls the quantity equation presented above , M.V=P.Q, “the transaction form” (of the quantity theory of money), as distinct from “the income form”, M.V”' p.Y' (the monetarist one). Marx reversed the first one, where P.Q means the total value of commodities that need to be circulated by money, that is bought and sold for money(Foley, 1986 24/25).

The time problem and the aggregate one are linked together, when the aggregate P.Q and the quantity of money circulating do not “correspond.” “Money that represents commodities long withdrawn from circulation ,continues to be current. Commodities circulate, whose equivalent in money will not appear on the scene till some future day” (K, 1,139). However, the economic and institutional link between (coin and paper) money and credit(bank) money, is missing here. Usually nowadays different monetary aggregates are taken into account: H, high powered money issued by the Central Bank,, MI,M2,and so on) . These statistical aggregates are often held to be the true monetary ones .; and the growth of Ml or M2 are “monetary targets “ for the stabilization policies of some Central Banks

For different reasons (not only historical ones), no “statistical” aggregate can be found in Marx's writings. What is important is that the quantity of money circulating as a flow is determined by the prices of commodities, whatever lags there may be. And when international exchanges are taken into account, there is no significant monetary aggregate, no “equilibrium quantity “a la Ricardo. According to Marx, as opposed to Ricardo, money does not have “the same value in all countries” even when common international costs of gold production are considered . There is no given stock of gold bullion to be distributed among countries as if “the amount of money in each country (were) commensurate with its wealth and industry” (Cr, 174-5) .The link between currencies and gold as universal money cannot be understood by the prevailing quantity theory of money.

Further analyses would be required to understand what an “international law of value” could mean (D.Bryan, 1995). Not only because to-day there is no longer a gold standard , but because of the former relation between gold and currencies.

III Criticizing monetarism: some lessons from marx 's theory

Monetarism is the main contemporary quantity theory of money. Keynesian economists criticize it (Tobin 1987). Marxist economists leave it aside. Two problems are interconnected:

the value problem -for all analysis of contemporary fiat money-;

the value- and -price problem discussed in Marxist analysis .

Here the second is enclosed in the first problem. Some keynesian criticisms of monetarism can help Marxists to clarify different statements

MONEY AND VALUE

Contemporary fiat money is not produced by labour, and per se it has no labour value. The absence of commodity value means that the common point of departure of Ricardo's and Marx's theories of money is missing. But subjective value (marginal utility) theories of money have no more initial value foundations: fiat money as such is not a useful good for consumption or production by individuals Is it the case for money in general ? Whatever the money form, commodity or fiat money, “money is an embarrassment to value theory” (Tobin, 1987). “The embarrassing puzzle is sharpest for fiat money”, but it concerns also commodity money, as we saw in Ricardo's conception . “The distinction between commodity money and fiat money is not absolute”(Tobin, o.c.). However fiat money will now be examined.

Valueless money is sometimes considered as a social institution without intrinsic value (labour value or marginal utility value). Different kinds of numeraire are proposed. Either money as a unit of account and a means of payments is like a particular form of economic coordination between individual traders. Sometimes credit money, issued and destroyed by the banking system, whatever is its link with money issued by the state, is at the centre of analyses (circuit theories) Or, according to some economists, money is

both some kind of social regulation and an expression of interindividual violence. Some Marxists insist on the class character of money as a social power, that is money-as-command. So from a purely economic point of view to “sociological “ ones ,valueless fiat money has different interpretations.

It is not possible to discuss these views here. But in any case, it seems as difficult to understand the economic status of valueless money as it is to determine the value of money.

In what follows, M.Friedman's monetarism is presented and discussed according to different propositions: the value of money as a particular asset, the exogenous supply of nominal money, the monetarist policy of stable money.

2. MILTON.FRIEDMAN'S MONETARISM

M.Friedman seeks to propose a purely economic theory of money, with no sociological considerations (M.Friedman, 1987). He presents monetarism as the contemporary quantity theory of money. He replaces the “transaction form” in Fisher's traditional quantity equation, M.V”'P.Q, with an “income form”, M.V”'P.y', where y' is the global net income at constant prices. In this “income form”, money is a particular asset to be held, rather than a means of circulation to be transferred (M.Friedman, id..) . The purpose of M.Friedman is to enclose a demand for money within the quantity theory so that money has some subjective value for individual economic agents. And it would be a demand for fiat money, since gold money has disappeared

However in both quantity equations, M, the quantity of money, is a stock , and not a flow. When new money is issued, as “it spreads through the economy... (it) is merged with the old and is distributed in the same way. Contrary to the keynesian approach, which gives almost exclusive importance to the first-round effect by putting primary emphasis on flows of spending rather than on stocks of assets”, the quantity approach “gives almost no importance to first-round effect” (Friedman 1987) Empirically the money stock is represented by the aggregate M2 (currency and deposits).

M.Friedman determines the value of money from a demand = supply equation for money by itself. Here money is an asset desired by individuals and held in cash balances. The demand for money, Md, is a stable function of real income and wealth. The supply of money, Ms, is the quantity of nominal money issued by the state (the Central Bank at the head of the banking system) . M.Friedman distinguishes two kinds of change of Ms. One is an increase of money “once for all”, and is equivalent to a change in the monetary unit- a substitution of cents for dollars -, and it has an immediate offsetting effect on the price level. The other one is “the change in the rate of change of money” and prices -an increase of 5% instead of the past 3%. It affects the “cost of holding money “, hence the desired quantity of money to be held. But in spite of this distinction, in both cases the key nominal parameter is the quantity of fiat money, Md. And the “price of money” is the reverse of the general level of prices, that is = 1/P The equilibrium quantity of money is defined by the demand and supply equation, Ms = Md.

The main criticism addressed by different economists to these monetarist statements is the “dichotomy” approach. Real relative prices are disconnected from money prices, just as in Walrasian general equilibrium theory .Those real variables in turn are exogenous to the path of the price of money (Tobin 1987).But we should go further about money as a particular asset. The common question about (fiat) money is. “how can money have positive value in exchange?”(Tobin, 1987)It is posed by Milton Friedman within the framework of subjective value and equilibrium prices, where there are only individuals and goods. Money should be introduced in this real world, but it cannot be. Relative prices, the real rate of interest, and re sources allocation are determined without money. In the stable function of demand for money introduced by M.Friedman, money as an asset is not determined as a condition of commodity exchange and price determination. And aggregate demand for money is derived from the demand function of a representative wealth holder.

Thus the exogenous quantity of nominal money supplied by the state is balanced by the rise (or the decline) of monetary prices. Money prices are disconnected from relative prices . There is no distribution effect, except between the state issuing nominal money, and individuals. Inflation (any increase of prices) appears as a tax on economic agents (seignorage). The only irrational” economic behaviour is that of the state's expenditure. So the Central Bank should be constrained by “rules versus discretion” when it issues “high powered money “

Nominal money.

Concerning international money, contemporary currencies are no longer, since 1971, connected with an international commodity standard. Monetarism is unable to take account of the international hierarchy of currencies, at the top of which is the dollar. Following Friedman (1953), floating exchange rates are the best regime, since in the free market for currencies supply and demand generate an equilibrium price. Speculation is rational . Friedman applies to international monetary relations the evaluation of the “real” competitivity of countries, according to the Purchasing Power Parity proposed by Cassel ;as if there could be a real (non monetary) rate of exchange directly reflecting the relative situation of countries. The analysis of the international monetary system is one of the weakest points of monetarism, as it is in all contemporary economic theories.

A good deal of discussions are influenced by these statements. Thus M.Friedman took part in discussions about the “Phillips curve”, and the allegedly stable inverse relation between unemployment and the rate of change of nominal wages (or prices). By contrast to keynesian interpretations of the Phillips curve, he distinguishes between real and nominal magnitudes: the quantity of labour demandded and supplied is a function of realy wages “Under any given set of circumstances, there is an equilibrium level of unemployment corresponding to an equilibrium structure of real wage rates”(M.Friedman,1987). So in the long run the Phillips curve will tend to be vertical at the natural rate of unemployment, and money is neutral. Only over short periods can a negatively sloping Phillips curve appear, if there is an unanticipated increase in inflation. So expansionary monetary and fiscal policies at best give only a temporary stimulus to employment and output and, if long continued would be reflected primarily in inflation”(id).

This is important for understanding recent discussions about the objectives of the Fed' 5 monetary policy (Brookings Papers, 1996, T) Keynesians want to maintain the objectives of employment and output, and to allow an increase of prices of about 3% . Monetarists say that the only suitable objective is the stability of prices, and if possible a zero inflation rate However, both parties agree to a theoretical compromise, about the relation between the rate of unemployment and the rate of inflation over short periods. Following some keynesian economists, there is a 1'non accelerating inflation rate of

unemployment ",NAIRU, different from the monetarist "natural rate of unemployment, but including some reference to an empirical macroeconomic equilibrium.

3.WHICH ALTFRNATIVE TO MONETARISM?

The first step is to specify the criticism of monetarism from Marx's conception of money, which is different from the keynesian one. The second step would be to present a Marxist alternative for understanding contemporary fiat money within the framework determined by Marx for any kind of money

We have seen that the process of circulation includes some economic socialization of individual economic agents submitted to a social division of labour. Transactions between these agents include monetary and institutional coordination without social organization. Following all quantity theories, money as such is useless, and so is valueless. Following Marx , money is inherent in transactions There is no equilibrium quantity of money linked to some equilibrium prices, in domestic or in international circulation. These statements pave the way for analyses of money capital, finance, monetary crises, and the role of the state. "We started with money as the converted form of the commodity. What we arrived at is money as the converted form of capital" (Marx,Plv).

However, in contemporary Marxist analyses, the problem of money is scarcely that of fiat money, from Marx's indications. It is mixed with the value-and-prices-of production problem, so that money is from the beginning included in capitalism, and includes distribution relations. The "centennial debate" is going on, and so it comes back to Marx's theory of money rather than considering contemporary fiat money. I do not wish to take part in the debate, elsewhere I had discussions with sraffian economists (Brunhoff 1992). I will simply give a short comment on some papers written by marxist economists.

All of them consider money in capitalism, instead of money in the circulation of commodities. According to Roberts (1995), money is simply "an extension of the general form of value". And "given competitive capitalism, the process of formation of prices and the process of formation of abstract labour are the same process.. (P)r ices of production accomplish the commensurability of commodities as equivalent in terms of their worth in capitalist exchange; abstract labour accomplishes the commensurability of concrete labour as equivalent in terms of the value created in capitalist production". Money as such does not matter. That is the more "economic" interpretation

If abstract labour in capitalism is first considered as a social relation, including a class distinction, money which "represents" it is a social one too, including power. This interpretation of Marx's theory has recently been once again developed by J Holloway, W. Bonefeld, H. Cleaver(1996) who analyse money within capitalism from the beginning of Capital. Here there is no research about prices, or about money as such. Money is chiefly command over labour. "It is an expression of capital' 5 ability to impose work(abstract labour) through the commodity form of exchange value"(Bonnefeld,1996). The state is a political form "through which the social power of money subsists".Thus "the focus is on understanding money as class struggle, and how the hanging role of money is constituted by the antagonist social relations of capitalism. This is an area of discussion that has been largely neglected by Marxists as by others" (Bonefeld and Holloway 1996). Here the critique of political economy involves the "critique of money " and of politics of money. Historical analyses of keynesian and monetarist class policies are made, which consider both domestic and international monetary relations and finance. Theoretical problems of value and price, and of contemporary fiat money, are left aside

In both cases, the "purely economic" analysis a la Roberts, and the mainly "political" analysis a la Bonnefeld, there is a common point of departure. The relation between commodities and money in the circulation process is left aside. Labour as value creating is at the beginning, but exchange relations are disconnected from production of commodities. Distribution relations, or class relations, are directly included in money. Then the money-form, commodity or fiat money, does not matter.

Things are different in D.Foley's analysis(1986) Foley presents "the general equivalent" and the circulation process set out by Marx at the beginning of Capital. He shows how those statements pave the way for criticising all quantity theories of money and of barter relations of exchange. He tackles the contemporary fiat money problem. However, in the solution that he proposes, two problems are involved: that of the valueless fiat money, and that of value and prices of production, so that the solution includes "a sraffian bias". If that bias cannot be kept out, which effect has it on money value in Marx '5 Capital? and on the analyses of money markets, finance, and politics of money?

From these different contemporary marxist writings, I conclude that we don't yet have a theoretical marxist alternative for understanding the value and the economic role of fiat money. In Marx's Capital we find means to understand and criticize monetarism, not only as a class policy, but also as an economic theory of money and price. If money matters, the research for its signification is to be pursued.

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THE SOCIOLOGY OF NON-EQUILIBRIUM

By G.Carchedi

The renewed discussion around the so-called inconsistencies in Marx's transformation procedure has had at least one important side effect: that of bringing to full day light the incontrovertible fact that a proper understanding of Marx's method is absolutely necessary in order to avoid the mistakes in which Marx's critics have fallen even since the publication of the third volume of Capital. [ENDNOTE 1] Two aspects of this method are especially important for the present purposes. First, his method is dynamic, i.e. based on a sequence of production, distribution, and consumption periods (rather than on a timeless reality) which tend towards crises rather than towards equilibrium. Empirical observation confirms this. Second, his method is dialectical. For our present purposes this means that reality is seen as structured in relations of determination between its different constituent elements and as a continuous transformation of what is potentially present into a realized state and vice versa of what has been realized back into a potential state. The usually forgotten distinction, and relation, between individual and social values is a pertinent case.

Rather than repeating an analysis which has already been carried out by many authors, including the present one, this paper addresses a different but related question. In neo-classical, as well as in almost any branch of economic theory, including equilibrium Marxism, reluctance to discharge the notion of equilibrium can be explained also by the theoretical void which, it is held, would be created by renouncing the notion that reality (including the economy) tends towards equilibrium. In plain terms, if the economy does not tend towards equilibrium, what keeps it together? If the market does not perform an equilibrating function, how come the economy as well as society do not fall apart and disintegrate? Surely, Marx too must have held onto the notion of equilibrium. The thesis in this paper is that the notion of equilibrium is not only alien to Marx's economic theory; it is also not necessary for a theorization of the economy and society. An inquiry into that which keeps society together will allows us to gain some insights into the dynamics and the dialectics of social reality (including economic reality) thus placing the dynamic and dialectical treatment of marx's transformation procedure in a more general theory of society.

Simple observation tells us that people, just because they live in a society, interact with each other. They might not interact all the time, but certainly this interaction is an essential element of their life. Moreover, observation tells us that the purpose of this interaction is to engage in some sort of activity, or process. In short, then, society is a complex of processes embedded in human interactions, or relations. Our investigation must therefore begin with the analysis of both processes and relations.

A relation is an interaction between two or more people. Every time a relation arises, or changes into a different type, or ends, there is a change in the social fabric. From this point of view, society is a kaleidoscope of continuously changing relations among people. Consider next the notion of process. This is an activity and therefore a transformation, considered in its (i.e. as) movement rather than as a result of that transformation. There are four different types of processes. A process can be a personal transformation, i.e. a transformation of the interacting people, a material transformation, i.e. a transformation of physical reality, a relational transformation, i.e. a transformation of the relations in which people engage, and a mental transformation i.e. a transformation of our conceptualization (knowledge) of this all (including our conceptualization of how we conceptualize i.e. of the production of knowledge). A more precise notion of society is then: a four-dimensional process embedded in ceaselessly mutating human relations. [ENDNOTE 2]

Relations and processes are here conceived of as existentially interdependent (i.e. one cannot exist without the other) in the specific sense that relation determine processes. As used in this paper, the notion of dialectical determinations stresses the relation between two (or more) elements of social reality, or instances: the determinant and the determined. Logically, but not chronologically, there are two phases in this relation, the active and the reactive. In the active phase the relation goes from the determinant to the determined instance and in the reactive phase the relation goes in the opposite direction, i.e. from the determined to the determinant element.

Consider first the active phase. In it, the determinant element acts upon the determined one in the sense that it transfers its social content to this latter (the notion of social content will be clarified shortly). A prerequisite for this is that the determinant instance must be ontologically, but not necessarily chronologically, prior to the determined one, i.e. that it must exist before the determined instance. Then, the determinant element, by being ontologically prior to the determined element and by transferring to this latter its specific content, is the determined element's condition of existence. If R indicates relations (among people) and P indicates processes, the relation of determination between relations and processes can be symbolized as R => P.

Consider next the reactive phase. The determined element is not passive but, being ontologically subsequent to the determinant element, reacts upon and either maintains or modifies (either radically or not) the determinant element's social content. It is in this sense that the determined instance becomes the condition either of reproduction, or of radical change, or of termination of the determinant instance. If we consider again the relation between relations and processes, the reactive phase can be represented as

R <= P.

Thus, the active phase cannot exist without the reactive phase (or, the determinant and the determined instances are mutually and existentially interdependent). This separation is possible only analytically. Symbolically, if the two phases are combined, we get

(1) R <=> P

Then, to submit that relations determine processes means to pose that (a) relations are the conditions of existence of processes because the former are ontologically prior, and transfer their content, to the latter and that (b) processes are the relations's conditions of reproduction, radical change, or termination because the processes's content reacts upon and either maintains or (radically) modifies the relations's original content. It is important to keep in mind that => and <= have these two quite different meanings, i.e. that the way in which R is an existential condition of P is different from the way P is an existential condition of R.

A key concept in the above is that of social content. If relations are interactions and processes are transformations, then social reality is in a permanent state of flux. This means that society is a dynamic whole whose movement, change, results in society's own reproduction, or radical change, or possibly termination. But if this is so, then each of the constituent elements of society (specific relations and processes) must contribute to, be functional for, the reproduction, or radical change, or termination of society. The social content of relations and processes, then, is their functionality (i.e. the specific way in which they are functional) for the reproduction, or radical change, or termination of the whole of

which they are part, society. The determinant element, then, transfers this functionality to the determined one. This latter, in its turn, reacts upon and possibly radically modifies the determinant element (and also the other determined elements) by reproducing or radically changing that functionality. [ENDNOTE 3]

At this juncture we must introduce the notion of individual and social relations and processes. Individual relations are forms of interaction among individuals who are here considered in their uniqueness, as unique individuals. An individual relation depends for its inception, continuation, transformation, or termination only on the uniqueness of those individuals and on their capacity and will to freely engage in that relation. This should not be interpreted as if other, 'external', factors did not play any role. They do, but only inasmuch as they change the specific and unique features of those individuals and thus of their individual relation. From now on, the individuals seen in their uniqueness will be referred to as concrete individuals. For example, a friendship emerges, (or continues, or changes radically, or ceases to exist) only because of the unique features of those friends and inasmuch as they are willing and able to continue (or change, or terminate) that relation. An individual process is then a process determined by individual relations. For example, they go fishing together.

For sake of brevity, in what follows, individual relations and processes, tied by a relation of dialectical determination, will be called individual phenomena. Notice that often by phenomenon it is meant a form of manifestation of some essence. This is not the case here. A process is the condition for the reproduction, radical change or termination of the relation and thus equally essential as the relation itself.

Social relations, on the other hand, are forms of interaction among individuals considered as possessing some common features (for example, they are all catholics), irrespective of the specific, individual, forms taken by those common features (e.g. one's specific way to be a catholic). It is because of these common features that these individuals are considered as members of a certain group. From this angle, those individuals are considered not in their individuality but as members of a group who share certain characteristics. As members of social groups, individuals are abstract individuals (since abstraction is made of their specific features, of their concrete forms of existence), while as unique individuals they are concrete individuals, the opposite of abstract individuals. [ENDNOTE 4] An important difference is that abstract individuals are replaceable (on account of their common features), while concrete individuals, being unique, are not. Given that all the individuals sharing certain qualities can participate in the same process, and thus can carry out the same tasks or activities (e.g. a soldier in a battalion), all individuals having certain qualities can carry out the same (tasks within a) process. If that process is replicated elsewhere (i.e. if more battalions are created), then the same tasks are replicated as well within those similar processes and thus the same individual can carry out those tasks within all those processes.

Notice that in reality individuals are always both concrete and abstract. However, analytically, individuals are either concrete or abstract: if we consider their unique features we disregard their common features, and vice versa. While the concrete features differentiate, the general features unify. Given that in reality an abstract individual is also at the same time a concrete individual, when people engage in social relations and processes they inevitably give a personal, concrete form to those phenomena as well. For example, “the capitalist is but “personified capital endowed with a consciousness of its own and a will” (K.Marx, 1967c, pp.289-290). In a classroom, a teacher and a pupil engage in a social relation (as teacher and pupil they are abstract, replaceable, individuals) but, just because both teacher and pupil are also concrete individuals, they necessarily give that relation a particular form which depends on the specific persons (concrete individuals) involved. That specific form is not essential for that social relation because any other teacher and any other pupil could carry out the same process of education and thus be a carrier of the social relations of education. Only, other teachers and pupils would give that same social relation another concrete form. From this angle, the personal is the form of appearance of the social, i.e concrete individuals are the personification of social phenomena.

Thus, a first condition for relations, and thus for the processes they determine, to be social must be sought in the principle of substitutability, and more specifically in the substitutability of people within relations and thus within processes (and their tasks) as well as in the substitutability of people among processes (and their tasks), so that any qualified individual can perform the same tasks in similar processes. Notice that replaceability implies the possibility to be replaced, even if the actual substitution does not take place. Notice also that a social process might arise as a unique example and that therefore there are no other similar processes in whose tasks people are substitutable.

When a social process is replicated in a number of similar processes, their tasks must also be similar so that both the process and its constituent tasks are standardized. Abstract tasks are then tasks which both can be performed by people with similar qualifications (who, therefore, are replaceable within those tasks) and which are replicated within similar processes (and which, therefore, are standardized). In other words, the structure of the abstract tasks constituting a social process is not discretionary because each of the processes replicating that social process must be similar, i.e. must have a similar structure of tasks.

But there is another pre-requisite for relations and processes to be social. Once people become carriers of a social phenomenon, they must perform those tasks and only those tasks which constitute that process and thus that relation. If a process is structured in clusters of tasks (positions) to be performed by different people, once an individual has taken up a certain (position within a) social process, his or her tasks are fixed and he or she has to perform only those tasks. Thus, the second principle is that of the rigidity of the tasks to be performed by each abstract individual once he or she takes up a certain position. Within a fixed structure of tasks common to similar processes, abstract individuals must perform specific (clusters of) tasks and are not free to determine which tasks to perform. The only way for them to change the tasks to be performed is to take up a different position within that process and thus within those relations.

Of course, the structure of tasks making up a process can change, as in organizational changes within an enterprise. But, given a certain structure of tasks, the agents who perform those tasks are under (legal or otherwise) obligation to perform those and only those tasks. An agent might be given some freedom as to how to perform a task but there must be limits to this freedom or that task will not be standardized and that person will not be replaceable. Moreover, since, as we shall see below, people's behaviour is what they do when they carry out processes (or their constituent tasks), social relations and processes required standardized behaviour as well.

A social process is then a process determined by social relations and thus a process in which people are replaceable within (a structure of standardized) tasks (in similar processes) so that all people having the required characteristics not only are able to perform those abstract tasks (in all similar processes) but also, once they have taken up a certain position,

must perform only those tasks in a standardized way. In other words, a social process is a process whose tasks (a) are independent of the will of the (concrete) individuals who must perform them and (b) can be performed by any individual with the necessary qualities. What defines a task in a social process (and thus an abstract task) is not the unique way in which each individual carries it out but its opposite, what all individuals must do, irrespective of their individualities (and thus irrespective of the specific way in which that task is carried out), in order to carry out that task. Again, for sake of brevity, social phenomena are here defined as the social relations and processes considered in their relation of determination.

Having examined above some of the features of, and some of the differences between, individual and social relations, we must now tackle the question of the genesis of social relations (and what follows applies to processes as well, given that they are determined by relations). [ENDNOTE 5] Only one among the different possibilities will be examined here, due to its importance for our present purposes, that of social relations emerging from individual ones. There are two sub-cases. Either social relations emerge as the result of the transformation of individual relations into social ones (but of course, not all individual relations change into social ones). For example, suppose two individuals get together as a way to cultivate their cultural interests. If more individuals join that group, at a certain point the satisfaction of that cultural need will become independent of the concrete individuals forming that group. Any sufficiently qualified individual can lecture, play music, etc. At that point an individual relation has been transformed in a social one.

Or social relations emerge as the result of the generation by individual relations of a separate social ones. Consider two or more friends deciding to set up an enterprise. In this case, the relation of friendship generates a new, different, relation which, inasmuch as those two persons are substitutable in that enterprise, is a social one. The former relation can continue to exist side by side the business one and the two relations can condition and modify each other. Alternatively, the relation of friendship can be completely replaced by the business one and disappear.

The possibility that social relations emerge from individual ones has three important theoretical consequences. First, if individual phenomena can either be transformed into or generate separate social phenomena, then individual phenomena can be considered as potential social phenomena. Second, it follows that, given that concrete individuals are carriers of individual phenomena and given that these can turn into social phenomena, concrete individuals can be considered as potential abstract individuals. Third, it also follows that social phenomena determine not only other social phenomena directly, as realized conditions of their own reproduction, or radical change, or termination. They also determine other social phenomena indirectly, by determining individual phenomenon as potential conditions of their own reproduction, radical change, or termination. This potentiality reveals itself when and if individual phenomena transform themselves into, or generate, new social phenomena. In other words, social phenomena determine indirectly other social phenomena through individual phenomena. It is because they already exist potentially in individual phenomena that social phenomena can emerge again, in a realized state, as new social phenomena.

We can now tackle the question mentioned at the beginning of this paper: what keeps society together? Continuity in social life requires a type of relations and processes which are independent of, and thus both pre-exist and survive, concrete individuals. These are the social phenomena. Without them, society would collapse and disintegrate. Social phenomena are independent of concrete individuals, given that only abstract individuals enter into social relations and processes. It is the interconnectedness of social, rather than of individual, phenomena which keeps society together, while at the same time causing it to reproduce itself, or change radically or terminate its existence because of the dialectical relation between social phenomena.

Let us call social structure, i.e. the structure of society, the whole of social phenomena bound by the relation of determination (in which the ownership relations are ultimately determinant). Three points follow. First, it is the social structure which, by being independent of which concrete individuals become abstract individuals, i.e. carriers of those relations and agents of those processes, keeps society together. There is thus no need, as in the neo-liberalist view, to ascribe this cohesive factor to the self-regulating and equilibrating function of the market, i.e. to the fact that the market, if not tempered with, tends towards equilibrium. As this analysis has argued, the cohesive factor is given by social relations and processes, i.e. by the social structure and not by the market. Second, it is because of the complex relation of determination binding all social phenomena that the social structure is not static but dynamic. Without the relation of dialectical determination among its constituent parts, society could neither continue to exist in a changed form, nor change radically, nor (possibly) cease to exist. Any contraposition between structure and movement is artificial. Third, the social structure is a subset of society, which is the whole of all relations and process, both individual and social, in their relation of determination.

To conclude, this paper has argued that the same methodological principles which guide us in the study of society guide us also in the study of the economy, and therefore in the inquiry into the transformation process, imprudently called the transformation problem by Marx's critics. And this is not surprising, given that the economy is only one of society's many aspects.

Endnotes.

(1) This is a short version of a much longer piece and cannot but highlight only some of the relevant themes in an incomplete way.

(2) This definition is more precise than the one given above. A third, and final definition will be given at the end of this paper, after the concepts of determination and of individual and social relations and processes will have been provided. These are not three different notions of society but successive approximations to the final definition.

(3) There is no room here for arguing that, of all relations and processes in which a society is articulated, the relations of ownership are ultimately determinant, i.e. are those which transfer their social content to all other relations (and thus to all processes). The basic assumption is that the relations of ownership's social content is their functionality, on the one hand, for the thwarting of the producers's human nature and, on the other hand, due to the producers's resistance, for the all round development of each and all. It is this double functionality which is transferred to the rest of society. Therefore, a determinant element transfers its social content to a determined one because it itself has gotten it in the last instance from the relations of ownership. It thus contributes (in a contradictory way) either to the reproduction or to the radical change or to the disappearance of those ownership relations (and thus of the society of which it is a part) at the same time contributing to either the full and all round development of each and everybody or not.

(4) Notice that both concrete individuals and abstract individuals are social individuals: the latter because they are carriers of social relations, the former because they are subject to socialization and thus are potential carriers of social relations.

What follows does not deal with the genesis of new fundamental social relations, i.e. of those relations which, by being the essence of society, cannot change without at the same time determining a change from a type of society to another. These, as mentioned above, are the relations of ownership.

ON THE QUESTION OF LABOR VALUES IN COMMUNIST SOCIETY: A PRE-TEXT

Paresh Chattopadhyay

Let us first make precise the principal terms in question in the present paper. 'Labor value' is not used here in the sense of classical political economy. That is, it is not simply a certain magnitude embodied in products produced by a certain quantity of labor — living and dead — with a view to exchange. Labor value rather refers to the value form that the products of (abstract) human labor take in the exchange process between the reciprocally autonomous producers where exchange is regulated by the relative quantities of socially necessary labor time contained in the products. Commodity is the material medium of the value form.

The term 'communist society' requires a somewhat longer treatment. It basically refers to the post-capitalist society as the emancipatory alternative to capitalism where human emancipation is premised on the self-emancipation of the producing class(es). Perfectly in accord with this emancipatory premise, the economic-social formation succeeding capitalism is based on a completely new mode of production, the associated mode of production (AMP), and the new formation could be characterized alternatively (and equivalently) as communism, socialism, Association, Union, Republic of Labor (these are Marx's alternative terms for the post capitalist society).[1] Union or Association in this context has a double significance. It signifies a voluntary, unmediated union of individuals who are all producers (after having ceased to be proletarians), and it is based, secondly, on the union — again unconstrained and unmediated — between the producers and the conditions of production, their own creation. This union thus constitutes a double negation of the individual's alienation: from the other individuals in society as well as from oneself (through the alienation of one's own product).

The union, the exact opposite of capitalism's separation and based on unmediated communal collective appropriation of the conditions of production, is, of course, not the restitution of the earlier 'union' in either of its versions — either constrained as in slavery/serfdom or voluntary as in 'natural communism' (including its patriarchal version) inasmuch as neither of them is apt for developing labor as social labor or for developing the productive powers of labor. Toward this end society had to go through a painful process of separation which alone allowed — through antagonism and enormous social cost — both the socialization of labor and the universal development of productive powers. Thus the new union is built on the basis of the acquisitions of the capitalist era. In this profoundly dialectical sense capitalism, indeed, constitutes the transition to communism (Marx 1962b: 419; 1969: 88; 1976: 327).

The individuals in the Association are free in the sense that in their relations of production there is no longer any “personal dependence” as in pre-capitalism nor any “material dependence” as in commodity-capitalist society (Marx 1953: 75). Labor ceases to be an occupational job for the purpose of providing subsistence and is transformed into a free and

[1] It should be stressed that Marx makes no distinction between `socialism' and `communism.' The same "non-capitalist society" or "the socialist constitution of (hu)mankind" — to use Marx's other terms — is supposed to pass through (at least) two phases. The distinction between socialism and communism and the (strange) characterization of the former as the "transition" to the latter are of later vintage and is foreign to Marx who, indeed, specifically mentions the "bourgeois mode of production" as the "transition to the new society" (1962b: 426) — which is of course as it should be.

conscious activity — toward the development of the individual's human essence. As opposed to the hitherto existing "false" community which was an abstraction, an autonomous power confronting and subjecting the individual, there is now a "true" community whose members are universally developed "social individuals" subjecting their social relations to their own control (Marx 1966a: 252-53; 1953: 593; 1962a: 92). Quite appropriately Marx considers communism (socialism) as inaugurating humanity's history with its "pre-history" left behind. Would (could) labor values continue to exist in communist (socialist) society, as certain eminent scholars — Marxist and non-Marxist — assume they would (could) (See, among others, Dobb 1940: 299-300; Lange 1945: 128; Robinson 1963: 23ff; Lukacs 1971:688)? In other words, would (could) products of human labor continue to take value form in the post-capitalist society?

Now a communist society, like any other human society, would have to solve the problem of regulating production by society's available labor time through the latter's proportional distributional among different productive spheres corresponding to society's different needs. There is, however, no unique transhistorical method to solve this central problem that would be valid for all social formations. Each social formation would have its own specific method for solving this problem corresponding to its own historically specific relations of production. Proportional distribution of labor time toward regulating production through exchange of products of labor taking value from (and operationally price form) naturally corresponds to a social formation where the products are the outcome of non directly social labors executed independently of one another. In a communist society, based on collective appropriation of the conditions of production, individual labor is, by definition, directly social from the start. There is thus no occasion — no need — here for the products of labor to go through exchange in order to be social. Labor values, therefore, cease to exist in communism (socialism).

Let us, however, for argument's sake, imagine the unimaginable. Let us make the 'heroic' assumption that the communist society finds it convenient to (re)introduce labor values as a mode of allocating social labor. What would be the consequence?

II

We first note that positing labor values — equivalent to positing exchange of products of human labor as commodities — would necessarily entail the existence of money which is the necessary result of the commodity's being, that is, of the double contradiction inherent in a commodity - contradiction between use value and exchange value as well as the contradiction that the private labor of the individual has to appear as social labor. However, in the first form of commodity circulation, selling for buying, where commodity is both the starting point and the terminus of the process ending in the consumption of use value, money serves simply as a measure of value and instrument of circulation and is merely the fugitive mediation facilitating exchange. Thus even though value form exists in this process, first as price of the commodity to be sold, then as realized exchange value in money and finally, again, as price of the commodity bought, the value form here "appears only to disappear." Here is a contradiction. In simple circulation exchange value is not realized as exchange value. Exchange value — money — is realized only in its disappearance. If commodity is exchanged against money — the form of exchange value — money remains as long as it is outside of exchange, that is, in a negative determination in relation to circulation. Exchange value, which has become autonomous in money, finds its absolute mode of existence by going out of exchange. However, money's self-realization is at the same time, its self-negation. By going out of the exchange process money negates itself inasmuch as, disconnected with commodities, prices and the process of circulation, money ceases to be money (Marx 1976: 12, 29, 31).

Naturally, the first form of commodity circulation — selling for buying — which is really only a mediated form of barter and where money acts only as a measure of value and instrument of exchange cannot be the general form of commodity exchange where all or most products are commodities (which is what is implied by the existence of labor values in general). This first form could rather correspond to a society which is only partially commodified, where the main aim of production is to create use values and where what is exchanged is at best the surplus above the immediate self-satisfaction of the producers. Contrariwise, corresponding to a society where exchange value and not use value is the principal aim of production, we encounter a different kind of circuit, that of buying for selling. Here exchange value does not disappear in the consumption of the commodity, the vanishing character of exchange value vanishes and exchange value becomes simply the means of producing and reproducing exchange value (Marx 1953: 932, 933). Here money re-enters the circulation process not, however, as a simple measure of value or medium of exchange, but in its third determination, as money as such, as the autonomised exchange value and, as such, means of payment. Here money, arising from the simple circulation process, becomes both the initial and the terminal point of the circuit. Here money as autonomous, -adequate exchange value must conserve itself in circulation and in this new positing cease to be money which as such does not go beyond negative determination — and becomes value in process, money in process, in which function alone exchange value could be multiplied to make any sense of the second form of circuit. However, under the assumption of equivalent exchange this additional value cannot be generated in circulation though it can be realized only in circulation. Nor is money itself capable of generating this additional value if one excludes merchant capital and usury capital — the so-called ante-diluvian forms of capital.[2] On the other hand, creation of additional values is impossible outside the reciprocal contacts of the commodity producers, given the assumption that the individuals can relate to one another only as independent possessors of commodities in a society where all or most products of human labor are commodities, which excludes individual's subjective dependence through extraeconomic relations like slavery or serfdom. In the circulation process money has to buy a commodity whose use value has the unique property of producing more value than it costs to reproduce it, and this commodity is living labor power the possessor of which is obliged to sell it, being unable to exchange labor in the form of objectified labor in another use value. The consumption of labour power, like the consumption of any other commodity, takes place outside the circulation process. We should note that in the exchange process, the second type of circuit of the possessors of money necessarily implies its opposite — the first type of circuit, commodity — money — commodity, which is the circuit of the possessors of living labor power, and where, as in any such transaction, the commodity that the laborers sell is use value to the buyer and exchange value to the seller. It is only the specificity of the use value of the commodity acquired by exchange which tends to transgress the bounds of simple circulation. (An apparently paradoxical result follows from the labourer's circuit of

[2] It should be observed that the circulation of commodities does not contain within itself elements of its own renewal. "Commodities have to be continuously thrown from outside into circulation in order that it continues like fire which would be extinguished unless continuously fed by combustibles from outside" (Marx 1953: 920).

commodity — money — commodity. Whereas the laborer buys the exchange value and the possessor of money the use value, the possessor of money obtains wealth while what the laborer receives vanishes in consumption. This appears as a dialectic turning what was expected into its opposite. The result is, however, natural inasmuch as if in the circulation the point of departure is commodity, that is, the use value as the principle of exchange, one necessarily arrives again at commodity where money appearing as means of circulation serves only as the vanishing mediation.)

The selling and buying of living labor power as a commodity would of course necessarily imply that the possessors of the living labor power have already been separated from the conditions of production where the separation has been brought about by the transformation of the law of appropriation of the simple commodity production into its opposite. In other words, the second commodity circuit, money — commodity — money, implies the transformation of money into money in process, value in process, that is, capital. The necessary trajectory of simple commodity into money and of money into capital should now be clear. As Marx observed in a letter to Engels: "The simple commodity form contains the whole secret of the money form and thereby, in germ, the whole secret of all the bourgeois forms of the product of labor," adding that the "economists have overlooked this simplest thing" (22.6.1867). In a significant passage of one of his manuscripts of 1861-63 Marx stresses the contradiction within the person of the simple commodity producer and remarks that "as the possessor of the means of production he is a capitalist, as a laborer he is his own wage laborer." (1956: 371). In other words, the contradiction between capital and wage labor is already present in germ in the person of the simple commodity producer, which only shows the contradiction of the commodity itself.

In the process of understanding the transformation of simple commodity production into capitalist production the most difficult thing to grasp is, as Marx observes, the necessary money form of the commodity — that is, money in itself, money as the autonomised exchange value, as the universal form of wealth, which means going beyond viewing money as simply a measure of value and a convenient medium of exchange. This popular notion of money, confined only to its first two determinations, seems to have been shared also by the classical political economy, particularly Ricardo. Indeed, Marx faulted Ricardo for his incomprehension of the nature of money — of money in itself — as it necessarily arises from the contradictions of commodity production. This was due to Ricardo's failure to investigate the specific character of labor which produces commodities, this labor which has necessarily to be represented as social labor in money. Ricardo was preoccupied with labor as the measure and magnitude of value. Ricardo regarded money as a simple sign of value and a medium of exchange. Ricardo's failure to understand the money form of value — necessarily connected with his misunderstanding of the commodity form as a specific form and by no means a natural form of the product of human labor — naturally affected his understanding of value's ultimate form, that is, the capital form of value as well (1958: 185; 1959: 500). Ricardo's concept of money would imply that commodity production remains at the stage of the first circuit which is only a mediated form of barter, thereby ignoring the first condition of capitalist production that the product as commodity has to have the necessary form of existence in money and go through the process of metamorphosis. (1959: 497; 1962b: 129; 1962c: 358). Similarly Marx faulted the left Ricardians and some socialists of his day for their failure to understand the necessary relation between commodity production and money inasmuch as these people, under the false notion that labor contained in commodities is directly social, wanted the abolition of money — substituting it with some kind of labor money — while retaining commodity production (1953: 690; 1958: 83-87).[3]

III

After the evaporation of labor values, what becomes of the status of labor and of exchange relation under AMP?

Labor as such, as "creative activity" or "purposeful productive activity" toward the appropriation of natural objects in useful forms is a process between the human being and nature in which the former through her (his) own action "mediates, regulates and controls its material exchanges (Stoffwechsel) with nature" effecting thereby not only changes in nature but also in her (his) own nature. In this sense labor is, of course, a "permanent necessity" independent of all social forms (Marx 1958: 30; 1962a: 57, 192; 1969: 26) and continues to be so in the Association.[4]

Now labor as a pure process of material exchange between human beings and nature is a "simple and abstract" category and as such does not take account of the social conditions in which it operates. However, all production, considered as "appropriation of nature from the side of the individual," takes place "within and (is) mediated by definite social forms" (Marx 1958: 241, 260). When labor's social dimension is brought in, labor takes on a new meaning. The question becomes relevant as to whether the labor process operates "under the brutal lash of the slave supervisor or the anxious eye of the capitalist" (Marx 1962a: 198-99). In fact these two broad forms epitomize, by and large, the type of labor (process) that has operated in "pre-history." Traditionally labor has been a non-free activity of the laboring individual — either as (directly) forced labor under "personal dependence" in pre-capitalism or as alienated labor under "material dependence" or "servitude of the object" (Knechtschaft des Gegenstandes) in commodity-capitalist society (Marx 1953: 75; 1966a: 76). Such labor has reduced the laborer into a "laboring animal" (Arbeitstier) (Marx 1962b: 256). Consequently the division of labor practised so far (in "pre-history") — corresponding to the "cleavage between the particular and the common interest" — has been absolutely involuntary, and has kept the laboring individual under its "servile subordination" where the "human being's own activity dominates the human being as an alien, objective power" (Marx 1973: 33; 1966b: 179-80). It goes without saying that such labor is totally incompatible with the human being's "free individuality" under the Association. With the extinction of the individual's personal and material dependence,

[3] Speaking of the value form and thereby the money form already hidden in the simple value expression of barter exchange, unrecognized by the economists, Marx noted in the first edition of Capital (not reproduced in later editions) that inasmuch as, before Hegel, the professional logicians overlooked the formal content (Forminhalt) of the paradigm of judgment and conclusion, it was not surprising that the economists, under the influence of material interests, have overlooked the formal content (Formgehalt) of the expression of relative value (1966a: 274).

[4] "It is precisely in the processing of the objective world that the human being's generic essence (Gattungswesen) is proven . . . The object of labor is thus the objectification of the generic essence of the human being in which the human being actively (and) really — and not simply intellectually — recreates her/himself" (Marx 1966a: 82). Referring to A. Smith's unilateral concept of labor as simple "sacrifice," Marx observes that labor as such, as the action undertaken to remove the objectacles towards attaining an end, can itself be viewed as "self-realisation (Selbstverwirklichung), (as) objectification of the subject and thus as real freedom" (1953: 505). Hegel had already noted a "moment of liberation inherent in labor" (1972: 177). "In tools," he further observed, "the subjectivity of labor is raised to the universal (zur einem Allgemeinen erheben)" (1923: 208).

labor, in the sense of "traditional mode of activity" (bisherige Art der Tätigkeit), also ceases to exist in the Association, it is "abolished" (1973: 54, 70).[5]

Labor, freed from its hitherto existing mode, would, of course, continue to be the "creative substance of wealth" just as labor time would continue to remain the "measure of cost required by (wealth's) production" in the new society (Marx 1962b: 255). In the same way the division of labor (of a completely different kind) would be equally possible" (ebensowohl möglich) when the "conditions of labor would belong to the associated laborers and they would relate to them as they are in nature, as their own products and the objective elements of their own activity" (ditto: 271).

The need for regulating production by appropriate allocation of society's labor time among different productive spheres would continue to hold in the Association. However, this regulation is effected without the need for social relations of individuals to appear as social relations of things. Under "communitarian production" the consideration of labor time as the creative substance of wealth and as the measure of production cost is "essentially different from the measure of exchange value (of labor or labor products) through labor time" (Marx 1953: 89).

Similarly a central economic law of all societies — the law of the economy of time — would continue to operate in the Union. However, here again, this law takes on a completely new character. There is a need for economizing society's global time for production not only indicating greater productive efficiency but also in order to release more (free) time for the "social individuals." Given social appropriation of the conditions of production, the earlier distinction between necessary and surplus labor time loses its meaning. Surplus product, the result of surplus labor, itself appears as necessary (Marx 1953: 506).[6] From now on necessary labor time would be measured in terms of needs of the "social individual," not in terms of needs of valorization. Similarly the surplus labor time far from signifying non-labor time for the few would mean free time for all social individuals. It is now society's free time and no longer labor time that increasingly becomes the true measure of society's wealth. And this in a double sense. First, its increase indicates that labor time produces more and more wealth due to an immense increase in productive powers, unconstrained by earlier contradictions. Secondly, free time itself signifies wealth in an unusual sense because it means the enjoyment of different kinds of creation and because it means free activity which unlike labor time is not determined by any external finality that has to be satisfied either as a natural necessity or as a social obligation.[7]

On the other hand, labor time itself, the basis of free time, takes on a new significance. Labor now is directly social, unmediated hierarchically or by the value form of its products and, bereft of its "pre-historic" antagonistic character, has a completely different quality compared with the one that is shown by the "beast of labor." However, the time of labor, given its determination by external finality, remains within the realm of necessity, it does not belong to the kingdom of liberty which lies beyond the sphere of material production and hence is accessible only by going beyond the labor time, though the kingdom of liberty can develop only on the basis of the kingdom of necessity (Marx 1964: 828)

As regards exchange, after the products of labor cease to take value form and labor is uniquely bestowed on creating useful objects and thereby becomes "real labor" (Marx 1958: 49), exchange relations as such do not disappear; material exchanges between individuals and nature — referred to earlier — as well as social exchanges among individuals continue to operate in the Association. However, like labor itself these two types of exchange undergo a profound transformation corresponding to the revolutionized social relations of production.

As to the first type of exchange, while the capitalist mode of production seriously damages the natural environment by undermining the natural powers of the earth along with those of the human producer, the "twin fountains of all wealth," under AMP the social individuals not only free themselves from subjugation by nature's blind force through a rational regulation of their material exchanges with nature but also carry on these exchanges in conditions most worthy of and in fullest conformity with their human nature (Marx 1962a: 529-30; 1964: 821, 828; 1976: 327). As regards the second type of exchange, after the cessation of all exchange of labor either directly — under personal dependence — or through value form — under material dependence (including objectified as well as living labor) — there appears, under AMP, "free exchange" among the social individuals, that is, exchange of activities determined by their collective needs and aims on the basis of the social appropriation and control of the conditions of production (Marx 1953: 77, 88).[8]

Let us conclude. Once labor values (operationally through the price form of the products of human labor) become the basic means of allocating society's labor time in communist society, there is no way one could avoid the inversion of the associated mode of production to the capitalist mode of production. We should understand that allocation through value (price) form of the products of human labor is not the only way of rationally (if at all) allocating resources (and income). This is only "a particular social manner of counting the labor employed in the production of an object" precisely in a society in which "the process of production dominates individuals, individuals do not dominate the process of production." (Marx 1962a: 95; 1965: 617).[9] Only the "routine of daily life" makes us accept as "trivial and self-evident" that a social relation of production takes the form of an object (Marx 1958: 28).

[5] In an important note M. Rubel observes that "Marx might have had in mind the etymological origin of the term `Arbeit' (labor) which is derived from `orbho' which in the Indogermanic languages means `small,' `poor,' `low,' `serf.' The same root is found in the French `labeur' from Latin `labor,' as well as in English `labour.'" (Marx 1982: 1823).

[6] Capitalism itself already prepares this ground objectively. Capital's "historic determination/destination (Bestimmung) is achieved as soon as the needs are developed to the extent where surplus labor over what is necessary is itself a universal need arising out of individual needs themselves" (Marx 1953: 231).

[7] Marx writes: "Labor time as the measure of wealth posits wealth itself on poverty and posits the disposable time as existing in and through the opposition to surplus labor time. This is positing the individual's totality of time as labor time and degrading the individual to the unique role of laborer, completely subsumed under labor" (1953: 596; our emphasis). Again: "Free time, disposable time, is wealth itself . . . which unlike labor is not determined by the compulsion of an external finality" (1962b: 255; emphasis in the text. `Free time,' `disposable time,' `labor' appear in English in the original). See also Marx (1976: 167ff).

[8] Here "community is posited before production." Here the "individual's participation in the world of collective products is not mediated by independent labor or products of labor. It is mediated by the social conditions (themselves) within which the individual's activity is inserted (Marx 1953: 89; 1958: 27).

[9] The term "counting" (compter) was substituted in the French version for the term "expressing" (auszudrücken) of the original version. Similarly Marx writes: "Where labor is common, the relations of individuals in their social production do not show themselves (darstellen) as `values' of `things.' Exchange of products as commodities is a certain method of exchanging labor, and of the dependence of labor of each upon the labor of the others a certain mode of social labor or social production" (1962b: 127-28; `values,' `things,' and the whole of the last sentence are in English in the text).

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CLASSICAL THEORIES OF REPRODUCTION AND NATIONAL ACCOUNTING

Edward B. Chilcote[10], March 11, 1997

Introduction

The world of commerce presents itself as a huge mass of commodities produced in different locations which are transported to many different places where they are used in the production of other new commodities or are themselves consumed. Roads and waterways act like veins upon which vehicles transport commodities, the lifeblood of society, to sites for production and to consumers for personal consumption. The commodities sold on the market are connected by vast networks which generally operate independently of government agencies or the direction of any one organization or person. Yet, the numerous individual acts of circulation take place so that, in general, the effective demands of producers and consumers are met by forthcoming supply. To the casual observer the matching of commodities produced with commodities demanded appears as a great mystery. Those who have attempted to represent this process theoretically have suggested that the process of economic reproduction is a lot like the planets in the universe (Koshimura 1951), or blood in the body (Quesnay 1972 and Marx 29: 60), regulated by a definite yet concealed order. They envisioned a process of reproduction in which the different components of capital are renewed unevenly. Just as blood is renewed more quickly than muscle, and muscle more quickly than bone, different types of capital are renewed at different rates. And, just as a body must be constituted with certain definite proportions of blood, muscle, and bone to continue to function properly the economy must also fulfill certain specific conditions for its own reproduction.

The time which passes in the production process and the circulation process can be accounted for empirically. Unfortunately, relatively few contributions have been made in this area. Most economists focus on one or another aspect of reproduction and abstract away from the process as a whole. Neoclassical economists generally focus on exchange, addressing questions of supply and demand, while mostly ignoring issues of production, circulation, and reproduction. Where production and circulation are taken up, they are done so in very general ways. Most classical economists focus on production, but ignore turnover, realization, and the circuits of capital. Common to both groups is the failure to analyze the process of reproduction in its entirety or to give the categories of reproduction empirical content.

The Neoclassical conception of a simple linear flow of commodities originating in a distant point, and after the application of land and labor, arriving on the market as a mass of finished consumption goods contrasts sharply with the circular conception embraced by Marx and the classical economists. In the classical conception, commodities act both as intermediate inputs and final outputs in a general cirular flow of commodities. The Neoclassicals view of production as a one way movement from “factors of production” to “consumer goods” offers no theoretical insight for national income accounting. Leontief noted that attempts to conceptualize the process of

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production as circular flow within the Neoclassical framework have failed (1966: 77). In contrast, the classical conception, in which commodities act as both inputs and outputs in a circular movement, shows the complex interrelations which exist in production and circulation. Unfortunately, even this circular flow framework is frequently presented as if there is one big lump of commodities advanced at the beginning of the year which generates a mass of commodities at the end of the year. This simple conception is useful for certain abstract theoretical questions, but fails to provide a sufficient basis for understanding the actual workings of the national economy. These two failures, the failure to conceptualize the process of production as circular flow of commodities and the failure to conceptualize the circular flow framework outside of a one year interval, have contributed to the oversight in integrating turnover and reproduction into national income accounting.

On the surface, the data which makes up the national accounts looks comprehensive, but further examination shows its many shortcomings. The failure of the dominant theoretical traditions to view the process of reproduction as important has been coupled with the failure of government agencies to collect and assemble data into categories used for the analysis of reproduction. The inability to view the process of social reproduction in its entirety has contributed to the unfortunate situation in which there is widespread incompatibility of data assembled by the various government statistical agencies. The capital stock and depreciation data is collected by several sources and none is directly commensurable with the input-output tables. Even the Bureau of Economic Analysis' data on capital stock and depreciation is not fully compatible with the input-output tables. The input-output tables themselves have changed form several times, and no effort has been made by the government to revise earlier versions to make them compatible with latter versions. This incompatibility is widespread. Employment data is organized by different agencies and fails to distinguish between productive and unproductive labor. The information on turnover is gathered by the U.S. Department of the Treasury based on income tax returns. Price indices are constructed using a very questionable methodology. The lack of a general and consistent collection strategy among the various government statistical agencies can be attributed to their failure to see the usefulness of the accounts and their relationship to the process of reproduction as a whole.

While theory ultimately underlies the categories used in data collection, convention is the basis upon which the national accounts are maintained. Conventional accounting categories do not match the categories used by the classical economists, thus necessitating the reconcilement of data to reflect the theoretical categories of the classical economists (Shaikh and Tonak 1994). Despite the theoretical vacuum in national accounting, considerable progress has been made in making it possible to empirically reproduce the taxonomy of the economy which Marx envisioned in volume II of Capital. This, however, presupposes an understanding of the theory of reproduction.

The theory of reproduction has been mostly neglected. Francois Quesnay's famous tableau and Karl Marx's schemes of reproduction are almost entirely disregarded. Yet, the reproduction schemes in Quesnay and Marx are blueprints which show the production and circulation conditions which must be met for the economic system to renew itself. They represent theoretical constructions which systematically outline the structural factors which limit and facilitate production and circulation. The schemes address the replacement of commodities used up and the conditions which must be met for growth. The contributions of Popov, Litoshenko, and Leontief are also ignored, if read at all. With only a few exceptions, little effort has been made to test the classical economic theories with empirical data. The gap between theory and evidence can be bridged and is a task which needs to be completed. Quesnay, Smith, Ricardo, and Marx did not have the detailed information available to them to carry out thorough empirical investigations of their theoretical hypotheses.

The strong similarities between Marx's theory of reproduction and input-output accounts provides the basis for empirically capturing Marx's schemes of reproduction. The theoretical structure which lies behind the input-output accounts is due, in large part, to the efforts of Soviet economists to represent Marx's schemes of reproduction empirically. Rendering Marx's categories compatible with the input-output accounts is made easier by this kinship.

Input-output economics has its origins in the classical tradition of Quesnay and Marx in which the economy is viewed to have a physical surplus. Similar to classical economics there is the notion of surplus embedded within the input-output accounts. The close association of input-output economics with the classical economic tradition can be traced through three major efforts to represent the process of social reproduction empirically. Each of these attempts has been met with cynicism and misunderstanding. They are mostly forgotten, and yet they are invaluable in providing the theoretical framework for understanding how the process of reproduction can be approached empirically. The first effort evolved with Francois Quesnay, whose theory of reproduction was based on his understanding of the physiology of the human body. Quesnay's familiarity with physiology allowed him to conceptualize economic reproduction as similar to the reproduction of an organism. Marx formulated the second major effort in volume two of Capital where he attempted to extend Quesnay's initial efforts by analyzing sectors (or departments), the forms of capital, and turnover. This volume has been mostly neglected both inside and outside the Marxist tradition. Third, a group of Russian economists built on Marx's schemes of reproduction to understand the process of social reproduction in the Soviet economy in the 1920's in order to anticipate supply bottlenecks. One very important member of this group, Wassily Leontief emigrated to the United States and began research on the U.S. economy. Leontief developed the input-output accounting framework which is now widely used in national accounts. The development of input-output accounts represented a huge step forward in extending Marx's own work. Yet, many of Marx's categories today are not adequately dealt with in the input-output accounts.

Unfortunately, the theoretical formulations of the classical economists have been largely forgotten and abandoned, and the lines which distinguish the alternate approaches have been blurred. Input-output economists have turned their attention to empirical questions, largely abandoning theoretical issues in favor of “policy” work. Consequently, while input-output economists have been influential in showing the empirical weakness of some approaches, they have failed to develop the largely forgotten theoretical foundation of the classical economists. The task of filling in Marx's categories of reproduction with empirical content remains mostly unfulfilled. While the development of input-output accounts represents a huge step forward in extending

Marx's own work, there are many further extensions which need to be considered to understand what needs to be done. Also, careful consideration must be given to developing the categories necessary to understand reproduction. For this we must consider the theories advanced by Quesnay, Marx, and the early Soviet economists.

I. Francois Quesnay's Theory of Reproduction

Writing in the eighteenth century, Quesnay was the first to articulate a theory of the economy in which both circulation and production were viewed as integral aspects of social reproduction. Using his understanding of physiology, which he learned first as a butcher and later as a surgeon, Quesnay was able to develop the fundamental categories and core structure of classical political economy. His theoretical scheme, distinguished by its conception of a circular flow of commodities, served as the underlying blueprint upon which Adam Smith, David Ricardo, and Karl Marx constructed their own theories. Quesnay's method of measuring inputs and outputs in physical magnitudes allowed him to address questions of growth and distribution consistently and systematically. Quesnay's theory of reproduction and accumulation, though modified particularly with respect to defining productive labor, remains largely intact within the classical tradition (Shaikh 1994). Quesnay is responsible for discovering that it is the rate of reinvestment out of the net product which plays a dominant role in the rate of accumulation. While some downplay this contribution as obvious, neither Quesnay's method nor his contribution should be belittled.

Quesnay's comparison of the circular flow of blood in and between the organs of the body with the circular flow of commodities in and between classes within society provided the first comprehensive theoretical framework for understanding the process of production and reproduction as a whole. Quesnay saw in economic society that the numerous acts of circulation could be grouped together in their social movement as a mass of circulation between the major economic classes of society. The comparison of the economy with the physiology of the body led Quesnay to many important theoretical insights. Building on his understanding of physiology, Quesnay showed through a simple diagrammatic table what would otherwise be difficult, if not impossible, to grasp. In a letter to Mirabeau, Quesnay said:

> ...the zigzag, if properly understood, cuts out a whole number of details, and brings before your eyes certain closely interwoven ideas which the intellect alone would have a great deal of difficulty in grasping, unraveling, and reconciling by the use of the method of discourse. Moreover these ideas themselves would be very elusive if they were not fixed securely in the imagination by the Tableau. Neither in themselves nor in their interrelationship will it now be possible for them to escape us, or at any rate it will be very easy to picture them as a whole in their order and interconnection at a single survey, so that we can contemplate them at our ease without losing anything from sight and without the mind having to worry about putting them in order. (in Meek 1963: 117)

As Quesnay himself stresses, the advantage of his model is that it abstracts from unnecessary detail and replicates the social movement of wealth through circulation and exchange by representing it as one movement. Quesnay views the economy as a circular flow of goods rather than as a linear outcome (Sraffa 1960: 93) . Reproduction involves both the production of new commodities and also the renewal of used up ones.

Quesnay's contribution represents the first significant step for classical political economy because it is the first systematic account of both production and reproduction. By developing the distinction between productive and unproductive labor he established the foundation for understanding reproduction. Quesnay provided a lasting service to economic theory by moving economic analysis, which prior to his work was almost entirely focused on exchange, into the sphere of production and showing that profit arises out of production rather than circulation. In doing this Quesnay was able to link the concept of capital directly with the concept of surplus. More importantly he demonstrated that if the social product was to reproduce itself, a portion of the product had to be put back into production. Not only did a portion of the product need to be put back into replacing means of production, but a portion had to be set aside for the subsistence of production workers. After these allocations were made the use of the remaining surplus or net product determined the rate of accumulation.

Quesnay's theory of reproduction demonstrates with clarity and simplicity the key determinants of reproduction and growth. It highlights the fundamental issues involved in analyzing reproduction, including the distinction between productive and unproductive labor, investment, and consumption. Quesnay's model is simple because it abstracts from the difficult issues associated with value and price, technical change, fixed capital, money, realization and turnover. But, this simplicity is also its biggest weakness. In addition to working at the level of one commodity, the framework fails to address the differing composition of inputs necessary to produce particular outputs. Several aspects of the theory of reproduction, including developing an understanding of productive and unproductive labor, technical change, turnover, money, and realization need to be developed to understand the process of reproduction in its full complexity. These are precisely the issues which Marx took up systematically in volume two of Capital.

A. Neoclassical economists on Quesnay

Quesnay's contributions have been downplayed by neoclassical economists. Some have suggested that Quesnay's work is nothing but “a vast mystification” -- obscure and unintelligible (Gray 1931). Samuelson claimed that Quesnay's prestige arose from “mystification and abracadabra (Samuelson 1982: 47).” Mark Blaug also showed outright contempt for Quesnay's work. In the introduction to a collection of relevant articles on Quesnay, he introduced Quesnay as an outdated obscurantist. Blaug said: “Francois Quesnay is one of those economists that students and even many of their teachers must leave unread: so intricate is his reasoning, so convoluted are his calculations, and so steeped is his every word in the outdated political philosophy and economic circumstances of eighteenth century France that only years of study can make any sense of his writings (Blaug 1991: ix).” The cautious silence with surrounds Quesnay is no doubt the result of malicious interpretations by supposedly respectable historians of economic thought, like Blaug, who suggested that Quesnay's work be left unread.

The reason for the apparent inability to appreciate Quesnay's work may be attributable to the significant differences between neoclassical production theory and the classical theory of reproduction. Sraffa (1960: 93) highlighted these differences: “It is of course in Quesnay's Tableau Economique that is found the original picture of the system of production and consumption as a circular process, and it stands in striking contrast to the view presented by modern theory of a one-way avenue leads from 'Factors of production' to 'Consumption goods'.” Regardless of what vulgar economists think of Quesnay's work it remains a pillar upon which the classical tradition, the Marxian tradition, and modern input-output analysis.

B. Marx on Quesnay

Karl Marx drew heavily from Quesnay's theory to develop his own understanding of production and reproduction. With perhaps the notable exceptions of Smith and Ricardo no economists' work is more highly regarded by Marx. Like Quesnay, Marx used the physiology of the body as a basis from which to understand social reproduction. He said: "In the human body, as in capital, the reproduction of the various constituent parts does not take place in equal periods of time. Blood is renewed more quickly than muscle, muscle more quickly than bone, which in this respect may be considered as the fixed capital of the human body (Marx, Collected Works, vol.29, p.60)." While Marx clearly admired Quesnay's work in much the same way he admired Smith and Ricardo, Marx's theory of reproduction is distinguished by its significant extensions and modifications.

Quesnay's schemes lack the theoretical rigor of Marx's in several important respects. Quesnay failed to account for fixed capital and reduced his inquiry of reproduction to one of anual circuits. He also limited his study to the flow of one commodity without distinguishing between types of capital. Additionally, his theoretical construction is left at the very abstract level and fails to account for money and different rates of turnover.

Other classical economists fail to address shorter than anual turnover periods. For example, Sraffa and the NeoRicardians abstract away from the reproduction schemes altogether, and reduce the whole process or reproduction and growth to the anual flow framework. While assuming that all inputs are advanced at the begining of the year and realized at the end may clarify specific theoretical issues, this approach it is insufficient for the study of such issues as the allocation of money capital and prices of production. Ultimately, the turnover of circulating must be known to calculate the necessary value of the capital advanced.

II. Marx on Reproduction

Marx's analysis of reproduction addressed five main areas; investment, forms of capital, turnover, money, and the interlinking of individual capitals in a whole economic system of reproduction. Marx argued that the role net investment plays in accumulation is a key determinant for reproduction. This argument was built up in part five of volume one of Capital and also in the Theories of Surplus Value. Second, the metamorphoses of capital involves its movement through distinct forms and is taken up in part one of volume two of Capital. Third, Marx analyzed how different individual circuits of capital require different duration's of time. Fourth, Marx showed that the whole process of reproduction depended on the realization of profit into the form of money. Finally, Marx showed how the circuits of individual capitals were interlinked and necessarily presupposed certain technical conditions for the reproduction and circulation of the total capital. Specifically, Marx addressed the renewal of the total capital (fixed and circulating) from the perspective of two types of capital - constant capital (means of production) and variable capital (labor power). These five issues comprise the bulk of Marx's attempt to move beyond Quesnay's work to explain the process of reproduction more concretely.

A. Investment-- Simple and Expanded Reproduction

Marx took up the question of simple and expanded reproduction in chapters 23 and 24 of volume one of Capital. Marx advanced essentially the same argument as that found in Quesnay's Tableau. He argued that the rate of accumulation depended upon the way in which the surplus product was used.

> Annual production must in the first place furnish all those objects (use-values) from which the material components of capital, used up in the course of a year, have to be replaced. After we have deducted this, there remains the net or surplus product, which contains the surplus-value. And what does this consist of? Only of things destined to satisfy the needs and desires of the capitalist class, things which consequently enter into the consumption fund of capitalists? If that were all, the cup of surplus-value would be drained to the very dregs, and nothing but simple reproduction would ever take place. (I: 726)

In volume one of Capital Marx, like Quesnay before him, attempted to show the basic conditions necessary for social reproduction to occur. He argued that the rate of reinvestment out of the net product determined the rate of growth.

Like in Quesnay's Tableau, the distinction between the production of the national output and its consumption critically underpined Marx's understanding of production and reproduction. Unlike Quesnay, who defined productive labor with reference to agricultural, Marx defined productive labor in terms of wage-labor and capitalist production (Marx 1969: 152). Marx argued that for labor to be productive it must be both production labor and also wage-labor which creates surplus-value. Shaikh and Tonak (1994) developed the theoretical foundations of Marx's distinction of productive and unproductive labor by analyzing the basic activities of social reproduction, including production, distribution, social maintenance, and personal consumption. They noted that all these activities are a part of social reproduction, but that only production directly results in the creation of new wealth (1994: 28). They observe that Marx's distinction between productive and unproductive labor is even more refined. They also found that the specific social relation under which labor is organized, for direct use, for sale, and for sale for profit determines if it is productive of surplus value or not. They argued that only labor which is both engaged in production and labor which is exchanged against capital is productive of surplus value.

Marx used the distinction of productive and unproductive labor, in the same way that Quesnay used the distinction, to show that the product of all labor does not produce new wealth but from the social perspective represents social consumption. Like Quesnay, Marx argued that accumulation is largely contingent upon new investment out of the net product.

B. Metamorphoses of Capital: Form

Marx wrote volume two of Capital with the intention of developing the issues involved in reproduction which Quesnay left unresolved. Most of the focus in this volume centers on the circuits of capital and turnover. Marx laid out an initial presentation of the circuit of capital in volume one to explain the commodity and the distinction between use-value and value and also to develop his theory of money. He noted that the process can be broken into stages which exist in time and take place through space. The acknowledgment of a spatial and temporal existence in economics is crucial because it represents a material rather than an ideal conception of production and distribution. In the material, commodities exist in space and are produced through space. Workers through their material actions regulate and control the metabolism of nature. They

intervene, so to speak, and confront nature to appropriate the materials of nature by setting into motion their own bodies to meet their own material needs.

The transformation of nature by labor into commodities and the exchange of commodities on the market taken together represents the "social metabolism" which so concerned Marx. The social metabolism of capital takes place through phases. Marx associated the process in which capital changes form and goes through phases with the life-cycles of biological reproduction. The reproduction of the economic system is very much like the reproduction of living organisms because both pass through phases and forms in their reproduction. The lifespan of capital is limited not only by production but also circulation. Capital is advanced for production, used in production, and eventually realized for profit in exchange.

Economic events represented in the social metabolism of capital progress in time and through space. The transformation of means of production takes place ideally in the mind prior to its material transformation. In production means of production are physically molded into commodities. The production of commodities require movement through both space and time. In the labor process means of production are brought together with labor power to produce new use-values. At the end of the production process new commodities come into existence, presumably with greater value and distinct material properties than those used as inputs. The act of exchange on the market takes place abruptly and represents a transformation in form. The forms which capital takes (money, means of production and labor power, goods in process, and commodities waiting to be sold) make up the metamorphoses or lifecycle of capital. The transformation of nature by labor into commodities and the exchange of those on the market taken together represents a "social metabolism." The two spheres in the metabolism of capital; the sphere of production and the sphere of circulation constitute the lifespan of capital.

The circuit of capital can be divided into three stages. In the first stage the capitalist appears on the market as a buyer of the commodities, labor power and means of production (Marx II: 109). At the moment of exchange the capitalist exchanges money for commodities **M-C (LP and MP)**. In the second stages the purchased commodities are productively consumed in the production of commodities. A greater sum of value is produced than the sum of the elements of production **C...P...C'**. In the third stage the capitalist returns to the market as the seller and realizes in money the surplus value generated in production. Thus, the circuit of money capital is represent by the transformation of use-value into forms **M-C...P...C'-M'**. From the perspective of use-value capital passes through a series of metamorphoses in which capital assumes different forms. Each of these forms fulfill specific functions. We call **M** money capital, **P** productive capital, and **C** commodity capital. Only after capital has fulfilled the function corresponding to the specific form in which it is in can it evolve into different forms. Through space and time capital changes its form. Marx says "the forms are therefore fluid forms" with each form preceding the others (Marx II: 184). The return of capital to one form is determined by its stay in another form. Capital is both the money held with the intention of being advanced and the commodities used in production and also in inventory which are thrown into this process with the intent of being drawn out later with a profit.

C. Turnover

The transformation of capital takes place not only through space and form, but also through time. If commodities didn't require time for production then they could be produced with boundless facility. In such a situation no time would elapse between the ideal conception of the commodity and its actual existence. The differing time periods which elapse are called turnover times. A circuit of capital varies according to the capital advanced and the industry which uses it. The year is the standard benchmark from which the classical economists evaluate the rate of turnover of particular capitals. All capital which turns over in a year or less is called circulating capital and all capital which takes more than a year is designated fixed capital.

The number of turnovers circulating capital takes in a year tells us how long it takes capital to complete its life-cycle within a year. If capital completes four turnovers in a year then it completes its cycle in three months. If the turnover time amounts to more than a year than we call it fixed and deal with it under the heading fixed capital. The formal distinction between fixed and circulating capital arises only for the different turnovers of the productive capital in the production process. The difference in turnover arises from the different ways in which the components of productive capital is transferred to the product. Circulating capital is entirely consumed within a year and fixed capital is only partially consumed.

Marx breaks constant capital into two constituent parts which he calls circulating constant capital and fixed constant capital. The portion of constant capital which maintains its specific use form in the production process in relation to the products which it helps to transform for more than a year Marx calls fixed constant capital. Examples of this include buildings and machinery. The extent which it gives up (depreciates) is determined by the average duration of its function from the time it enters production to the time in which it is completely used up (Marx II: 237). Constant circulating capital by contrast is fully consumed in both its use-value and value aspects in the course of a year. Nevertheless fixed and circulating capital are not independent capital investments. Both are necessary in production even though investment decisions may be represented as different spheres of investment and may be and generally are staggered in time.

1. Circulating Capital

Unlike Neoclassical usage of the term capital where capital is understood as only fixed plant and equipment, the classical economists use the term capital to describe money advanced for plant and equipment (fixed capital) and also for intermediate inputs and labor power (circulating capital). Fixed capital is distinguished from circulating capital by the fact that it remains in production for longer than one year. Circulating capital exhibits turnover times less than a year. Unlike fixed capital, circulating capital is completely absorbed into circulation and returns from it whole within a one year cycle. The part of capital which is fixed, the actual machines and structures, continuously throughout a given year give up (or depreciate) only a portion of their value.

While capitalists function as the organizers for production and exchange, they are constrained by the fact that capital itself must be tied up in the production process and also by the fact that the realization of the value of their commodities before further investments can be made. The number of products produced in a given period of time

and how frequently capital can be valorized in a given period of time to reproduce and multiply depends on the turnover or velocity of circulation. The repetition of the production process is restricted by the amount of time which elapses during the transformation involved in production and realization. If there were no circulation time required in the production and realization of commodities, the production process could be repeated limitlessly. Capital could be advanced without limit and the very notion of value creation would be nonsensical. The transformation would occur in reality as quickly as it is processed in the mind. In this unrealistic case no time would pass and the whole meaning of value would disappear.

Marx went to considerable length to examine this process and to show the forms in which capital is tied up in its metamorphoses of form. He argues in the first part of volume two of Capital that goes through phases as it transforms itself from one form to another. Circulation and production proceed in both time and space. When metals are extracted from a mine or commodities moved from their point of production to its site of consumption this takes place through space and time. Marx characterized the return back to an initial form as a circuit of capital. Each of these forms identified above represent phases of time as financial capital, productive capital, and commercial capital.

Capital passes through various economic moments which are divided between two great sections of time. On one side is the production time and on the other side is the time needed for circulation. These two sections of time account for the vast majority of time needed to complete a full circuit of capital. In circulation and production, capital appears as a unity of two moments. The circuit of capital is completely renewed when the periodic process returns to an earlier form. This periodic process Marx calls turnover. The duration of turnover is limited by principally two moments: production-time and circulation-time. Differences in the duration of turnover between industries and firms can originate from either factor.

The time necessary to complete a circuit is determined largely by spatial considerations. The change of location of the object of labor and labor itself limit the speed with which means of production can be transformed. Marx illustrates this. He says: “the cotton that is moved from the carding shop into the spinning shed, coal lifted from the pit to the surface” are examples of the movement in space and the time consumed in this movement (Marx II: 227). Further a product can only be sold when it is transported from its place of production to its place for sale. The product moves from the sphere of production to the sphere of consumption. The sum of production time and circulation time represents the total turnover time. It is spatial movement which ultimately limits the speed with which products can be produced. The overall time which elapses in production and in circulation also limits the availability of capital and hence restrict the valorization process. Capital can only be advanced when it returns to the money form. To increase profitability capitalists generally accelerate the process of production and limit the time goods are stored.

Capitalist firms in different industries must advance different amounts of capital depending on the turnover of circulating capital. The cloth maker may lay out fresh capital on wages and material for one week and realize the product within that time span. With the money from the realized product he can hire the worker back for the next week without having to raise additional capital. In contrast a car producer may have to lay out capital for wages and raw material week after week for a month. In this example, the business of the cloth producer requires an outlay of one week while the business of the car producer requires four times as much circulating capital (see Marx II: 307). One can see from this example that profitability is significantly affected by turnover. The two producers in the course of one month may pay the same amount of money for raw materials and wages but the car makers really advances four times what the cloth maker advances because of the turnover times of circulating capital.

2. Fixed Capital

With fixed capital only a small portion of the capital is transferred (depreciated) to the product in the course of a year. Unlike circulating capital fixed capital does not circulate in its use form. Instead its value circulates and does so only “bit by bit, in the degree to which it is transferred to the product that circulates as a commodity (Marx II: 238).” A part of its value it always remains fixed as long as it functions. In the circulation of fixed capital, value is transferred from fixed capital to the commodity in the form of depreciation. Marx said of this peculiarity “value thus acquires a dual existence. A part of it remains tied to its use form or natural form, which pertains to the production process, while another part separates off from this form as money (Marx II: 242-243).” A machine with the value of $100,000 which lasts for five years does not need to be renewed for five years. During these five years its value circulates “bit by bit” as it is depreciated until at the end of five years it is completely transformed back into money. In the material or use value sense, fixed capital is tied down and nondisposable until it has been fully used up. The turnover times of capitals differ according to their different spheres of investment. The assets which comprise fixed capital have differing lifespans. For example the plant and equipment used in the rail industry including locomotives, bridges, tunnels, rail, rail stations all have different lifespans from the plant and equipment used in say textiles. These differing turnover times must be accounted for in our analysis of reproduction.

3. Depreciation

As fixed capital is used up, the value fixed in it steadily declines (is depreciated) until it is completely worn down. Generally depreciation does not express itself in the outward or physical disassembling of plant and equipment but in the throwing off of value from fixed capital.

D. Money in Reproduction

Money is the principal mover through which each individual capital steps onto the scene and commences the process of production and circulation. It gives the fist “impulse” to the whole process of reproduction and critically underlies the smooth functioning of reproduction (Marx 1981: 430). In the first stage of the circuit of capital the capitalist appears with money on the commodity market as a buyer. He converts a sum of money into a sum of commodities. M-C (LP and MP). Only after means of production and labor power have been purchased can the production process be set in motion. The turnover of individual capitals must repeat itself afresh at definite intervals and this itself presupposes that money is available to continually initiate this process.

In the absence of a developed credit system, the purchase of sufficient means of production and labor power to initiate production capitalists requires the accumulation of a money hoard sufficient to meet the costs of capital. Since the proportions in which the

production process can be expanded is not arbitrary but prescribed by specific technical factors, money must be built up into a hoard of latent money capital (Marx 1981: 430). The formation of hoards appears as a part of the process in which capital operates (Marx 1981: 162). The extent that the turnover period is governed by the length of the working period which is itself determined by the material character and duration of the production process. The dependence on money capital can be overcome by the credit system. If the credit system breaks down and recedes back into a monetary system, monetary hoards become essential and can limit the whole process of reproduction.

Commodity production presupposes commodity circulation, and commodity circulation presupposes the representation of commodities in money and monetary circulation. When capital is in the money form, Marx called it latent capital because productive capital cannot be set in motion to generate surplus-value. Thus, Marx showed that under a money system the duration of turnover forces greater advances of money capital for longer times. Production is itself limited by the extent of money capital available to individual capitals. He noted that the limitation imposed under a monetary system are overcome by the credit system and the forms of association related to joint-stock companies (1981: 433). Credit acts like a lubricant which accelerates the rate of turnover.

A collapse of the credit system could bring business and the whole process of reproduction to a halt. Marx argued that when the credit system collapses the monetary system reasserts its significance. Under a monetary system even small disturbances in the money market slow the process of reproduction dramatically (Marx 1981: 434). Exchanges between producers are mediated by money capitalists who accumulate profits by monetary circulation itself. When money is hoarded exchange becomes more difficult because less money is in circulation hence limiting the pace of reproduction.

E. Reproduction of the Total Capital

The turnover of individual capitals represents only specific moments in the movement of social reproduction and act as integral links in the movement of the total capital. Marx considered the process of reproduction from the standpoint of the replacement of the individual components of the whole social capital. He argued that from the perspective of social capital individual capitals are only fractions of the total social movement and act as integral links in the movement of the total capital. The metamorphoses of individual capitals are considered from the standpoint of the replacement of the individual components of commodity capital. Marx argued that it cannot be presupposed that the individual commodity input requirements of individual capitals are always available on the market and considered how the capital used in production is replaced and how the movement in the social capital is intertwined with the consumption of surplus value by capitalists and of wages by workers (II: 469). Marx took up this concern by developing the distinction between constant capital and variable capital and surplus value. Using this distinction Marx brook the total social product into two departments. The part of the value of the annual product which replaces constant capital is the product of Department I and the portion of the annual product which produces means of consumption is the product of Department II.

Certain specific conditions must be met for simple reproduction to occur. Quesnay showed that outputs produced had to equal or exceed the inputs used. For Marx the conditions of simple reproduction not only included the replacement of existing capital but its replacement in specific proportions. Marx argues that reproduction is conditioned by the mutual relations of input components used in the production of the social output. Neither labor nor intermediate input alone are capable of reproducing the existing product. Thus, social reproduction necessitates the reproduction of means of production and also labor in a specific proportion. The simple reproduction of the existing product requires that the value of the product of department two at least equal the value added of the whole economy. Marx represented this condition of simple reproduction as $II_{(c+v+s)} = I_{(v+s)} + II_{(v+s)}$. More specifically, a condition of simple reproduction is that the value of the components v+s of the commodity capital of department I equal to the value of the constant capital used in department II (II:478). The value of the output of department I represents the constant capital consumed in the course of production. Simple reproduction, of course, is inconsistent with capital, which itself presumes self expansion. Despite this observation analyzing the extreme condition of simple reproduction illustrates how reproduction must be considered from the standpoint of the replacement of the individual components of capital. In expanded reproduction the stringent conditions associated with simple reproduction are not applicable. Reproduction on an expanded scale requires that the input requirements associated with the production of expanded output be met. This means that an additional amount of the output of department I be retained by department I.

In contrast to simple reproduction where it is assumed that the whole surplus product is spent on means of consumption, in expanded reproduction a part of the surplus product is retained and invested in additional means of production. In the hypothetical transition from simple to expanded reproduction the surplus product which was used to purchase the output of department II (means of consumption) in simple reproduction is converted and used as additional means of production for department I in expanded reproduction. Thus, in expanded reproduction (or capitalist accumulation) the value added of department I cannot be equal to the value of constant capital used in department II. The immediate effect of a transition from simple to expanded reproduction is that fewer elements of constant capital produced in department I which were formerly used in the production of department II are redirected for use in department I (II: 572). Thus, a material constraint for expanded reproduction is that sufficient output of department I be produced to meet the demands of investment.

Marx's theory of reproduction represents an improvement over Quesnay's theory in at least five distinct ways. First, he developed the distinction between productive and unproductive labor to demonstrated the origins of wealth and hence the most immediate possibilities of reproduction. Second, he laid down the theoretical foundation for understanding the forms reproduction which capital must go through to realize profit. Third, he showed that turnover times are staggered across industries and limit the possibility for capitalist expansion. Fourth, he illustrated that money can limit the pace of accumulation. Finally, Marx integrated these conditions into a general model to show reproduction in a more general way. These five advances discussed above illustrate the information which needs to be gathered to give Marx's theory of reproduction empirical content.

ii.) Perspectives on Marx's Theory of Reproduction

Marx's efforts to illustrate the process of reproduction schematically have been largely ignored. In the preface to volume two of Capital Engels forewarned that the book would

not be popular because it "contains no political fodder." In a letter to Lavrov in 1884 Engels wrote: "The second volume is purely scientific, only dealing with questions from one bourgeois to another (Mandel :11). In a separate letter he anticipated that the lack of political material would make volume two a "great disappointment (Mandel : 11)." He continued by noting that "the second volume will always remain a sealed book" in which "official economic literature" would observes a "cautious silence with regard to it." Rosdolsky noted that the schemes of reproduction went mostly unnoticed by the German Marxist literature at the turn of the century. Volume II of Capital "simply remained in total oblivion (1977: 460)." But, for a period debates around Marx's schemes of reproduction consumed the Marxian literature.

The debates in Germany in the early part of this century turned the attention of the Marxist tradition towards the schemes of reproduction but failed to develop Marx's effort, and instead focused on the political implications rather than extending Marx's analysis theoretically or empirically. These debate focused on whether the schemes demonstrated a harmonistic view of capitalism or one characterized by crisis. Many social democrats viewed the schemes of reproduction to be a vindication of their view that capitalism was a social system with limitless possibilities. This harmonist perspective was advanced by social democrats like Kautsky, Bauer, and Hilferding (Rosdolsky 1977: 450). In contrast, breakdown theorists, like Luxemburg () and Grossman (), attempted to show that the harmonist perspective was completely misplaced. Luxemberg argued that reproduction necessitated external demand. Grossman argued that a falling rate of profit would give rise to "breakdown." While the schemes of reproduction became the centerpiece of the debates between "neoharminist" and "breakdown" theorists, no effort was made to extend these schemes or to do empirical work on reproduction.

III. Extensions of Marx's Theory of Reproduction and Input-Output Economics

One little known but very significant attempt in the 1920's was made to extend Marx's schemes of reproduction to the conditions of reproduction in the Soviet Union. Famous Soviet economists such as Popov, Litoshenko, and Leontief were brought together by the Soviet Central Statistical Association as a select group to provide a theoretical and empirical foundation for understanding the bottlenecks plaguing the Soviet Union (Spulber 1964). These economists, similar to Quesnay and Marx before them, were pioneers who confronted the difficult task of explaining reproduction theoretically. But, not only did they have to explain reproduction in theory, they had to develop an empirical accounting framework and offer suggestions for resolving supply bottlenecks. They approached this project by applying and developing Marx's theoretical framework of reproduction and constructing an accounting scheme that could trace the flows of commodities at a very disaggregated level (Spulber 1964: 3).

Quesnay and Marx's theory of reproduction served as the foundation upon which the accounting scheme used in the "Balance of the National Economy" was constructed. Popov and Litoshenko recognized Marx's scheme could provide the methodological foundation upon which a national balance would be computed (1964: 7). They used Marx's schemes of reproduction as the starting point for devising their input-output balance (Spulber 1964: 3). Popov noted that while Quesnay and Marx were concerned with "purely theoretical solution to the problem of reproduction" the balance offered a "statistical basis" for showing how the social economy is reproduced under specific empirical conditions.

They viewed the balance as furnishing the material foundation for analyzing theoretical hypotheses of the classical economists by providing the statistical evidence necessary to make sound evaluations of their theory. The balance was viewed more as a statistical operation which would show how goods are produced and distributed in a given year (Popov 1964: 5-6). Litoshenko (1964) envisioned an accounting scheme that would track the flow of goods within a given year to measure the flow of economic activity and measure the economic interdependence thus serving the function of an income statement. He also visualized a table which would act like an "instantaneous photograph" which would show the real quantities of material in various stages of processing roughly corresponding to M-C-M'. This table would function very much like a balance sheet in financial statements (Litoshenko 1964: 32-33). Unfortunately efforts to bring the business accounting framework to the national economy have not been pursued .

The "Balance of the National Economy" should be judged as a remarkable achievement in the theory of reproduction. It was the first attempt to show that Quesnay's and Marx's efforts could be given empirical content. Stalin viewed the project differently. He saw the effort as a "game with figures (Spulber 1975: 27)." He dismissed Popov and "liquidated" many of his coworkers in various purges (Spulber 1975: 27). The project was regarded as "antimarxian" and consequently further work had to be done in complete secrecy (Hardt et. al. 1967: 71). Hardt and his coathors wrote "Stalin's negative attitude was probably the main reason for the almost complete evanescence of the study of the overall balancing methods in the Soviet Union (Hardt et. al. 196: 71)." In the 1950s the Soviets resumed their work on tables similar to the "Balance" for planning purposes.

The perspective that the analysis of reproduction developed was extended by the Soviet economists is not popular amongst Western economists. Mierynck, for example, contended that the Russian economists "borrowed" their ideas from Western input-output economists and wrongfully claimed credit for it (1965: 85). Richard Stone (1986: 13) argued that while it is possible to suggest precursors to input-output analysis "...all this does not quite add up to input-output analysis." Left to their own interpretation input-output economists would prefer to entirely credit Soviet economists for the development of input-output economics.

For all the protestations of Western economists to the contrary, a great intellectual debt is owed to the Soviet economists and Marx for their roles in laying out the theoretical foundation upon which the input-output accounts are built. One member of the group who worked on the "Balance," Wassily Leontief, developed the first input-output tables for the U.S. economy. This effort was positively received, and for it Leontief later received the Nobel Prize in economics. Leontief (1976: V) in the preface to his book said that the Harvard economic research project represented an attempt to lay an elaborate foundation for the empirical study of long-run problems. The ultimate aim of the project was to establish an internally consistent 'tableau economique.' In the formative years of input-output analysis the stress was clearly on constructing a framework for understanding reproduction and long term trends.

For ideological reasons, work on the input-output accounts in the United States was stopped in the 1950s. The input-output accounts were perceived to be a threat to the "private enterprise system" because they were viewed as a step towards "push button planning." In the 1950s it was thought that input-output economics would lead to a "super planning agency (Business Week 1951: 98)." The "chilling" image of a "robot-managed age" led to an extreme reaction by business leaders (Business Week 1952: 23). At least one businessman foresaw it as a potential threat capable of "replacing democracy." The concern about the political implications of planning eventually led to the abandonment of the input-output program (Business Week 1953: 26). Mierynck (1965: 79) said that "... because of the curtailment of funds in 1953, there was a period of more than five years during which government agencies in the United States could not engage in such analysis." The perceived threat to "private enterprise" ultimately halted the development of input-output accounting and every effort to give credit where it was due.

Perhaps hoping to avoid further confrontation input-outptut economists moved to portray input-output accounting a "value free" science which merely provided tools "free from political ideology" (Mierynck 1965: 88). This perspective now dominates the work in input-output economics. The extension of input-output analysis to empirical applications has been the central focus of the input-output literature. During World War II the input-output accounts were used to successfully predict serious shortages in steel (Leontief 1987: 862). In more recent decades input-output models have been developed to explain interregional flows and developments, Keynesian multiplier analysis, energy input analysis, military spending, and even environmental pollution.

One consequence of the focus on policy is that the relation of input-output economics to the classical economic tradition and the theory of reproduction have been mostly forgotten. The ideological overtones of the 1950s put input-output economists on the defensive, and they deflected criticisms of being Marxian by distancing themselves from the origins of their own approach. While there was some discussion of Quesnay's Tableau, there was virtually no discussion of Marx's schemes of reproduction. Moreover, in recent years input-output economists have stressed the relation of input-output economics to Walrasian general equilibrium models rather than its true origins in the classical tradition (Hatanaka 1970: 8). By highlighting the similarities of the input-output economics to neoclassical economics, they have legitimized input-output economics in the mainstream. The link between input-output economics and the classical tradition has been so severely severed that some input-output economists internalize this view and argue that the theoretical background of interindustry economics is provided by the general equilibrium model of Walras and Pareto (Hatanaka 1960: 8). Chenery and Clark (1993: 1). The draping input-output analysis in the robe of Walrasian general equilibriumt has had the effect of leaving input-output economics suspended in a theoretical vacuum. The subtle incorporation and representation of input-output economics as neoclassical has obscured the elementary principles of the classical approach which underlies the input-output accounts. As a consequence of all the attention devoted to policy analysis and neoclassical economics, input-output economists no longer view understanding social reproduction as a worthy objective.

A few notable exceptions to this general trend include the works of economists like Luigi Passinetti (1977), Anwar Shaikh (1984, 1994), Ed Ochoa (1984) and Michel Julliard (1982) who have attempted to extend the input-output accounts to the study of reproduction and also the hypotheses of the classical economists. Passinetti (1977) stressed the similarities between Sraffa's analysis and input-output economics and suggested that these accounts can be used to test classical economics. However, Pasinetti never extended his comparisons to the empirical world. Shaikh (1984) showed that labor values are excellent approximations of market prices. In his book on measuring the wealth of nations, he utilized the input-output accounts to measure variable capital, surplus-value, and productivity growth (). Julliard, Bertrand, and Pisani-Feri (1982) showed that the input-output accounts can be used to compare Marx's departments systematically.The theory reviewed in the above sections and the work of Passinetti, Shaikh, Ochoa, and Julliard go a long way toward outlining exactly the work which needs to be completed to give Marx's analysis of reproduction empirical content.

While in a few key respects input-output economics represents a clear advance over previous work on reproduction, it also suffers from major shortcomings. It's achievement is mainly that it goes beyond accounting for annual flows of the net product to include the commodity flow inputs used in the production of the total output. But, in many crucial respects the input-output accounts are crude and undeveloped. While input-output accounts are analogous to the income statements in corporate reports, no effort has been made to develop a corresponding balance sheet or "snapshot," as was suggested by the Soviet economists Litoshenko in his work on the "Balance," to determine the rate of turnover, the stock of capital on hand, and the rate of capacity utilization. With respect to Marx's theory of reproduction there are at least six major shortcomings. First, the sector classification schemes are different for the different base years and are never adjusted and made consistent for all the base years. The nonexistence of a set of compatible tables can be attributed to the lack of intertemporal work done in input-output economics today. Second, the input-output accounts do not specify the wage basket used to reproduce productive workers. Third, they fail to make the distinction between productive and unproductive labor. Fourth, capital stock and depreciation data have been collected haphazardly and inconsistently and very little effort has been made to make it compatible with the input-output tables. Fifth, no effort has been made to determine the rate of turnover of the capitals advanced by industries. Finally, little work has been done to test the validity of price indices which critically underlie question of intertemporal measurement. In light of Marx's developed theory of reproduction it is obvious that input-output economics suffers from major shortcomings. Despite the number of shortcomings in input-output framework for the analysis of reproduction these deficiencies can be overcome. The gaps between Marx's analysis and the input-output accounts can be filled.

This task of filling these gaps must begin by identify them through careful study of the theory reproduction.

IV. Data Needs

Let us consider the basic data that we will need to fill in the categories which Marx used in in his theory of reproduction. Using Shaikh (1995) and Pasinetti's (1977), the variables we need for matrix manipulation include.

l = row vector of labor coefficients ; A = input-output coefficients matrix

D =	depreciation coefficient matrix;	K =	capital coefficients matrix
T =	turnover times;	U =	capacity utilization
w =	wages (value added component);	t =	indirect taxes (value added component)
X =	total industry output;	Q =	total commodity output
e =	price index vectors		

The specific details on how the data is collected and the issues involved in assembling this data are covered in the next chapter and appendices A through G.

Conclusions

My review of the classical economists works on reproduction shows that their attempts to understand the process of reproduction in the economy involved the theoretical construction of a taxonomic model analogous to the taxonomy of the body. As in Quesnay the flows of blood in and between the organs of the body were matched by models which envisioned the flow of commodities and money in and between sectors of the economy. This taxonomy involved understanding the sources and flows of income, the rate of turnover, and distribution across sectors and classes. For Quesnay the taxonomy was organized around agriculture and distribution of its product to different classes. For Marx the taxonomy involved many theoretical categories including an understanding of the existing social relations, the role of investment and consumption, the change in forms in the circuit of capital, the duration of turnover, the role of money, and the division of the economy into two departments. I have also demonstrated that the taxonomy that lies behind input-output accounts are related to efforts of Quesnay and Marx. Despite their similarities they failed in certain respects to replicate the work of Marx, whose analytical scheme remains the most developed theoretical foundation for understanding reproduction. These tables and national accounts can be made even closer to the taxonomy which Marx envisioned. However, modifications must be made to develop the empirical categories in Marx's framework, including the development of the distinction between production and consumption, flows and stocks and the rate of turnover, fixed capital and depreciation.

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PRODUCT INNOVATION WITHIN THE MARXIAN THEORY OF VALUE AND CAPITAL

Francisco Paulo Cipolla[11]

I Introduction

In his book Capitalism, Socialism and Democracy Schumpeter argues that Marx´s theory of value is incompatible with innovation because it presupposes perfect competition.[12] According to him, only perfect compectition could distribute surplus value proportionately to capital advanced, generating equal rates of profit. Innovation, as search for extra-profits is thus seen to be incompatible with Marx´s labor theory of value.

Marxists, on the other hand, have not done much in the way of theorizing on product innovation. This is due to the fact that the debate about technical progress evolved mainly around the issue of the tendency of the rate of profit to fall. This debate took into account process change only, while assuming as given the composition of the social product. One of the few marxists, if not the only one, to take up the issue of product innovation was Lebowitz (1976). Unfortunately, he chose to conceive of product innovation from an underconsumptionist point of view.

This paper derives product innovation from Marx´s theory of value, social need and capital implicit in the Grundrisse and the three volumes of Capital.

I will argue that the drive to decrease production time leads necessarily to changes in the social composition of production, as the increasing buying power which comes with the cheapening of commodities weakens the rate of consumption of some kinds of products relative to others. This approach differs from Pasinetti (1993), for whom increased buying power only shifts demand within a pre-established set of commodities. While for Pasinetti demand determines the changing pattern of production, in this paper demand only signals that capital has to innovate so as to keep the rate of growth of demand compatible with a given rate of valorization. In other words, the social composition of production is not pre-determined.

II. Product Innovation in the Grundrisse

Marx argues in the Grundrisse that capital is pressed to create new products because the use value character of the product sets a limit to demand. The social need for each commodity represents a limit to the ever present drive to expand value. In other words, use value manifests itself as the limit to the exchange value of the product (Marx 1968, pp. 209-211). It is clear from this analysis that product innovation emerges from the limit that the use value nature of the product poses to the valorization of capital. It is therefore striking that Lebowitz (1976) has chosen to derive product innovation from an underconsumptionist viewpoint. In fact, there is an unavoidable contradiction in his entire argument: the underconsumptionist theory of product innovation requires an ever increasing value of labor power as new commodities have to constantly reshape the standard of living of the workers. This is at odds with the tendency of capital to restrict workers buying power relative to the social net product implicit in the underconsuptionist aproach.

In the present work product innovation is conceived within the notion of capital in general.

III. The Nature of Capital

Capital is value that seeks its own expansion at a maximum rate per unit of time. Marx´s formula for the circuit of industrial capital immediately reveals the importance of time in the concept of capital:

$$M \text{ -- } C \begin{matrix} LP \\ \ldots . P \ldots . \\ MP \end{matrix} C' \text{ -- } M'$$

As Marx emphasized, capital is the unit of production and circulation, each one of these two phases requiring a definite amount of time to be executed. Production time encompasses the period in which labor power (LP) uses the means of production (MP) so as to produce new use values (C'). That is, the production period is equal to the duration of the labor process, except in those cases where production processes require the maturation of the product without any intervention of labor. The production period is the time required to transform the means of production into new commodities:

$$\begin{matrix} LP \\ \ldots . P. \ldots . \\ MP \end{matrix} C'$$

Circulation time, on the other hand, is simply the time it takes for the commodity form of capital to be transformed into money:

$$C' \text{ -- } M'$$

The faster the production process, the more rapidly can a given productive capital be used again in order to extract more surplus value. The faster the circulation period, the more rapidly can a given volume of capital generate new value. Thus, the rate of valorization of capital depends crucially on the periods of production and circulation.

Let us define turnover time as the sum of production time and circulation time, that is, the total time it takes for a given money capital to pass through the whole circuit of industrial capital. We can now define the number of turnovers within a period of one year as

$$t = \frac{1}{T_p + T_c}$$

It goes without saying that if the sum of Tp and Tc is equal to one year then the number of turnovers is equal to one. It follows that the smaller the production and circulation periods the greater will be the number of turnovers.

The annual measure for the rate at which capital expands as it goes through its circuit is called the annual rate of profit. If we take into account a pure circulating capital model we can express the annual rate of profit in terms of Tp and Tc. Let us define m as the

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[12] Schumpeter (1951, p.90 and following).

markup over circulating capital costs. The annual rate of profit ra, can then be expressed as follows:13

$$r_a = m\frac{1}{(T_p + T_c)}$$

The rate of expansion of value can be said to be a continuous struggle against the time it takes for capital to go from Productive Capital to Commodity Capital and then from Commodity Capital to Money Capital 14. The strive to reduce the time it takes to go through the valorization circuit is the realm of innovation from the point of view of capital. Innovation appears therefore to emerge from the nature of capital as value striving for maximum expansion per unit of time. To the extent that innovation is implicit in the nature of capital, it can be said to be independent from competition.

IV. Productivity and Product Change

We shall now explore the relationship between production time and circulation time. The decrease in production time may affect circulation time in two opposite ways. The decrease of production time implies that the amount of labor required to produce a given commodity has been reduced. Inasmuch as this results in the cheapening of commodities, it tends to increase the rate of consumption per unit of time. This increase in the rate of consumption per unit of time is equivalent to a decrease in the circulation period.

Yet, the cheapening of commodities raises real income. Insofar as the rise in real income leads to a decrease in the rate of consumption of certain commodities, it causes also an increase in the circulation time for those capitals producing those commodities. To the extent that rising real income slows down the consumption rate of certain goods, it has a negative effect on the annual rate of profit of capitals engaged in the production of those goods. We can, therefore, associate production time with supply conditions and circulation time with demand conditions.15

Production time determines supply conditions insofar as it determines the social value of commodities. Demand, on the other hand, is basically defined by the notion of social need (Marx 1976, p.183). Marx defines social need as "the quantity of commodities that society is capable of paying at the ruling social value" (idem, p. 182).16 He goes on to add that social need is limited by the nature of the commodity itself. There is only so much bread that can be consumed by a single stomach.

It follows that the lower value of commodities tends to increase consumption. However this increase is circunscribed by the conditions ruling demand, i.e., social need. Social need together with supply will determine the exchange value of commodities, that is, their market values.17

For the full social value of commodities to be realized it is therefore necessary that they be produced to the extent required by social need at the ongoing social value. If supply exceeds social need, then the market value, vm, will be lower than the social value, vs:

$$\text{Supply} > \text{Social Need} \quad \Rightarrow \quad \text{vm} < \text{vs}$$

This can be better seen if we define ξ as the rate of growth of demand and t as the rate of growth of labor productivity. The market value of a commodity will depend on the social value of that commodity as well as on the relative effects of productivity change, t, and demand growth, ξ:

$$v_m = v_s + v_s(\xi - t)$$

Market values and social values will be equal when the fall of social value brought about by rising productivity is equal to the increase in consumption brought about by the fall in social value. Market values will fall bellow social values when the effect of productivity on the social value is larger than the effect of social value on demand:

$$v_m < v_s$$

In this last case there is a loss of value to the extent of the difference between (vs - vm) per unit of product. The total unnecessary labor time for the production fo this particular commodity can be calculated as the product of (vs - vm) times the total amount of units produced.

V. Superfluous Capital and Product Innovation

The difference (vs - vm) is an index of the excess capital engaged in the production of a particular commodity. The amount of excess capital engaged in the production per unit of product can be expressed as the product of the difference between social value and market value times the capital/output ratio, k:

$$\text{sup}\,erfluous.capital = (v_s - v_m)k$$

This superfluous capital has to be invested in the production of a new commodity 18 if it is to attain the rate of profit prior to the increase in productivity. Otherwise, the

[13] The above expression for the profit rate is based on Foley (1986, chapter 5). For the sheer purpose of simplifying, I have chosen to exclude here the time required to convert *money capital* into *productive capital*, T_f, in Foley´s notation.

[14] In referring to capital as a unit of production and circulation Marx says: "Capital invents mechanisms in order to shorten the phase in which it has to lie immobilized (in circulation; parenthesis mine, FPC). Instead of allowing these two conditions to coexist side by side capital makes them succeed one another" (Marx 1968/III, p.200).

[15] Lebowitz (1976, pp.246-247), for instance, argues that the increase in circulation time results from underconsumption. This idea, although at odds with the main thrust of the present paper, supports the notion that circulation time is associated to demand conditions.

[16] This definition of *social need* corresponds to Smith´s concept of *Effectual Demand*. However, Smith´s concept is contradictory. Effectual demand, according to him, is the volume demanded when price is at its natural level (Smith, 1965, p.56). But natural prices depend on the natural rates of wages, profits and rents. The natural rate of wages, in turn, depends on the prices of the consumer goods which compose the subsistence wage. Natural prices are thus dependent on prices. The argument is irremediably circular. In Marx, on the other hand, social need is defined relative to a value not yet transformed in price by the action of demand. The magnitude of social need relative to the social value of a certain amount of supply will determine the market value (market price in Marx).

[17] I am adopting here Giussani´s terminology (Giussani 1996). In Marx, the notion of *market value* in chapter X of volume III of *Capital* corresponds to the notion of *social value* of chapter XII of volume I of *Capital*. In this paper, *market values* correspond to what Marx calls *market prices* in chapter X of volume III of *Capital*.

[18] Marx (1968/II, p.213). In this passage Marx refers only to the increase in supply following the adotion of a more productive method. He does not analyse the effect of this new method of production on the price of the product. Yet, the increased production may lead to greater demand if the price of the product falls. The process of freeing capital for the production of new use values has to take into account not only the increasing supply but also the behavior of prices and demand.

struggle to reduce production time will result in a devaluation of capital relatively to the previous rate of return.

The aggregate tendency to reduce production time may therefore lead to an increase in circulation time for certain goods. If it does so then it devalues the mass of produced value below the amount of labor bestowed in the production of those goods. It is through this mechanism that the continuous reduction of production time sistematically creates superfluous capital within the old composition of production. The productive use of this superfluous capital requires the opening up of new branches of production or the continuous invention of new commodities from within the pre-existing branches of production. The process of development of productive forces implies necessarily the development of new social needs, i.e, new use values.

VI. Conclusions

Contrary to what Schumpeter has suggested, innovation can be derived from the circular flow of Marx´s capital circuit and on the basis of his theory of value. Specific market structures can be grafted upon the abstract analysis presented above. When competition is allowed for, the notion of indididual value is added to the interplay of social values and market values. Absolute concentration may accur if increases in productivity cause social values to sink below individual costs of production for any particular producers.

Contrary to Lebowitz (1976), product innovation is derived not from the restriction of workers buying power but from the demand relative to a given composition of the social product.

Without increases in productivity, the system can expand extensively fueled by demand created within the schemes of reproduction. Rising productivity however requires a continuously changing composition of production so as to keep up the rate of capital self-expansion.

It is important to say that the increase in real income which results from rising productivity is taken by the system of firms as a starting point for their activity. That is to say, firms do not wait for the rate of growth of demand for their products to decelerate in order to begin their product innovation plans. If they did so the new product would be unavailable by the time deceleration took place. Reality thus gives us the impression that innovation is simply caused by the interaction of capitals in competition.

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HEGEL, SCHELLING AND SURPLUS VALUE

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This is a short speech to propose two thesis handled from an uncommon point of view. § 1) Criticism of political economy in Marx's Capital was built taking into consideration, in a very precise form (and to a greater extent than that commonly accepted), Hegel's framework, specially of his Logic. § 2) However, he produced a total reconstruction of Hegel's categorical system, introducing a new category, starting from Schelling (whether directly or indirectly influenced is not the point), in the absolutely essential subject of "surplus value" (November 1857). The constant irruption of surplus value ex nihilo (aus Nichts: from the nothingness of capital) gives the reproduction of capital a very special qualitative physiognomy.

§ 1. The Categorial order in Hegel's "Logic" and Marx's "Capital"

The similitude of "order" of categories in Hegel's Logic and Marx's Capital is more surprising than what was normally considered. In Hegel's Logic and in Marx's Capital they arrange their categories in the following "order":

a) Being and value. In the first place, "the doctrine of Being",[19] because everything starts from the Being: "Pure Being makes the beginning".[20] The Being of capital is for Marx the "value" (Wert). Since the Grundrisse[21] one can see how Marx went from money as the "beginning" (Anfang) -against Proudhon o Marimon- to place value as the absolute "beginning" of the critical discourse. In Capital we read: "The value-form [...] is absolutely without content and simple"[22] as the Being. The Being is for Hegel "the Foundation" (Grund),[23] and Marx frequently repeats that production, labour, value is what one returns to "as into its foundation" (zurück als in ihren Grund).[24] The Being is (for both Hegel and Marx) permanency and process: The Being is and becomes (value remains and develops as "valorization of value" (Verwertung des Werts).

b) Being and "this-Being" (Dasein) and value and commodity. For Hegel the "Being" (Sein) becomes "this-Being" (Dasein).[25] The "determinate Being" is the "Being-there" (Da-sein) as "something". For Marx the "Being-there" (Dasein) of the value is the commodity: "Our analysis has shown, that the form of value (Wertform) or expression of

[19] Enzykl., § 84ff, Hegel, 1971, v. 8, pp. 181ff; Engl. ed. pp. 123ff. Reference is made to Hegel's Encyclopaedia to simplify references.

[20] Ibid., p.182; p.124.

[21] See Dussel, 1985. There we read: "Capital is nothing more than simple value". Grundrisse II, Marx, 1974, p.177; p. 265.

[22] Capital (1867) I, Preface, Marx, 1975, MEGA II, 5, p.12; p.19; in German: "Die Wertform [...] ist sehr inhaltslos und einfach". In the Great Logic, Hegel writes on the Being: "[...] ganz Form ohne allen Inhalt", Hegel, 1971, v. 5, p. 6. Hegel himself speaks equally of the simplicity of the Being: "das Unmittelbare [...] einfach", Ibid., p.79.

[23] Hegel, Enzykl. § 121ff, Hegel, 1971, v. 7, pp. 247ff; pp.175ff.

[24] Grundrisse II, p.166; p.255.

[25] Enzykl., §§ 89ff; p. 193ff; pp. 133ff.

value (Wertausdruck) of commodity originates in the nature of value".[26] The value (the Being and Foundation) shows in the commodity (the Being and appearance: Dasein).[27]

c) Quality and use-value. For Hegel, the first determination of Being is "Quality": "A Being (Dasein) is the Being (Sein) with a determination, that as unmediated and as determination is Quality".[28] Quality determines the Being as this-Being, something, with certain content. For Marx the first determination of the Being (value) is the use-value: "Every useful thing[29] [...] may be looked at [...] quality [...]. The utility of a thing makes it use-value [...]. The use-value is the material content (stofflichen Inhalt) of wealth".[30] The Hegelian "quality" is then the "value of use" in Marx's economic criticism.

d) Quantity and exchange-value. The second determination of Being, in Hegel, is "Quantity".[31] "Quantity" is a summary of the Being (with itself). Likewise, for Marx the "exchange-value" is the second determination of value: "Exchange-value [...] presents itself as a quantitative relation, as the proportion in which values in use of one sort are exchanged for those of another sort".[32] What is interesting is that exchange-value is not the value: only a "mode of expression" (Ausdrucksweise) or "form of manifestation" (Erscheinungsform) (a phenomenon, a Being: Dasein) of value (the Being: Sein).[33]

e) Measure and Money. The new moment in the development of Hegel's Logic is constituted by "the Measure" (das Mass):[34] "in Measure quality and quantity are [...] in immediate unity".[35] Likewise, for Marx, "Money as a measure of value (Wertmass) is the necessary apparition form (Erscheinungsform) of the immanent measure of value of commodities, which is the labour-time".[36] Money is the measure of the use-value of a commodity for the exchange-value of the other: it is a quantitative-qualitative relationship.

f) Passing over (Uebergehen)[37] from Being to Essence; transformation from Money to Capital. Hegel must "pass" from Being to Essence. Essence is the reflection unto itself of the Being: it is the Being of Foundation (Grund), World of Appearances (Welt) and Reality (Wirklichkeit). For the time being, we are interested in the "pass over" from Being to Essence. For Hegel it is a "pass over" without difficulty: one "passes" from the Same (Being) to the Same (Essence). For Marx, the transformation (Verwandlung) (the "pass over": Uebergehen) from Money to Capital is a jump to infinity: it is an absolute change of nature.[38] In § 2 we will return to this fundamental question. For the time being let us observe that Marx, following Hegel, "passes" from value (Being) to capital (Essence).

g) Essence and Capital. "Essence" for Hegel is permanence and process; it is a totality with many determinations, with different depth levels (such as: Identity and Difference, Foundation and Existence-Thing (Ding) or World of Appearances, Reality and Substance,[39] etc.). The "structure" of Hegel's Essence is the paradigm from which Marx developed the "structure" of the Concept (Begriff) of capital. The determination of the Essence of Capital is Money, Commodity, Labour, Means of Production, Product, etc. They move as a permanent process (production, accumulation, circulation, rotation, reproduction, etc.). A circle, a circle of circles, a growing spiral, the valorization of value (Verwertung des Wertes): a hurricane being globalized:

> "Value is here the subject (Subjekt) of a process, in which, while constantly assuming the form in turn of money and commodities, it at the same time changes in magnitude [...] The original value, in other words, it valorizes itself (selbst verwertet)."[40]

However, the difference lies in that for Hegel Essence is "identical with itself";[41] Essence is the original Identity. On the other hand, for Marx capital is not identical with itself. At the time of the accumulation (B) there is more value (surplus value) than in the original (A) production process. Capital-A is not identical to Capital-B. As we shall see, this non-identity is the basis of the distance between Hegel and Schelling.

h) Foundation and production. For Hegel the Essence is the Foundation (Grund).[42] For Marx the "fundamental" moment of capital is the process of production.[43] Production is the Foundation of exchange-value, of circulation, of market, of price, etc. Marx takes from Hegel the Foundation concept and applies it to production:

> "We therefore take leave for a time of this noisy sphere, where everything takes place on the surface (Oberflaeche)[44] and in view of all men, and follow them both into the hidden (verborgne)[45] abode of production".[46]

The sphere of production is the foundational level of capital.

i) World of Appearances and Circulation (Market). For Hegel totality is the World of Appearances.[47] Likewise, what is "founded" in the Foundation is what "appears", the "appearance": (the phenomenon of Kant and Hegel: die Erscheinung). Circulation or the Market is the "World of Appearances" or of commodities. In what is occult, invisible, out of view is the Foundation: the sphere of Production (the factory). Once again it is a direct

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[26] Capital (1872) I, 1, 4, Marx, 1975, in MEGA II, 6 (1987), p. 92; p. 66.

[27] See Dussel, 1988, Chap.1, pp. 27ff. Marx writes that commodity has "its character (Charakter) as Being (Dasein) of the exchange value", Manusc. 61-63, 1; Marx, 1975, MEGA II, 3, 1, p. 15.

[28] Enzykl., § 90; p.195; p.134 (I translated the text to English).

[29] Here "thing" (Ding) is no longer simply the "Being" (Dasein), but developed: Dasein -> Existenz -> Ding, time on the third part of the Logic, but it would be to extensive to explain all the subject's development.

[30] Capital I, 1, Marx, 1975, MEGA II, 6, p. 7; p. 44 (I translated the text to English).

[31] Enzykl., § 99ff.

[32] Capital I, 1, p. 70; 44.

[33] Ibid., p. 72; p.46 (I translated the text to English).

[34] Enzykl., § 107ff. In the Great Logic he does not consider the "degree", but goes directly to the "measure". See Hegel, 1971, v.5, pp.387ff, the text Marx studied with greatest care.

[35] Enzykl., § 108; pp. 22-226; p. 158.

[36] Capital I, 3 (1872), p. 121; p. 97 (I translated the text to English).

[37] Enzykl., § 84: "their further determination (the dialectical form [die Form des Dialektischen]) is a passing over (Uebergehen) into another", p. 181; p. 124.

[38] We have analyzed this "transformation" in all my works (Dussel 1985:137ff; 1988:57ff; 1990:138ff).

[39] In this sense "labour is the substance of value", because: "The substance is cause" (Enzykl., § 153). It is the causality, the Thing (Sache) that causes an effect (the value).

[40] Capital I, 4, 1 (4); p. 172; p. 152.

[41] Enzykl., § 115; p. 236; p. 166.

[42] Enzykl., "The Essence as Ground of Existence (das Wesen als Grund der Existenz): §§ 115ff.

[43] Capital I, Sect. 3-5, Chap. 5-16 (7-18); pp. 163ff; pp. 173ff.

[44] The "surface" is the market, the World of Appearances, the phenomena, the Difference.

[45] The "hidden" is the Ground, invisible, the Essence, the Identity.

[46] Ibid., Chap. 4, 3 (6); p. 191; p. 172.

[47] Enzykl., §§ 132ff; pp. 264ff; pp. 188ff.

application to the economic criticism of the Hegelian difference between Essence-Appearance, Foundation-Phenomena, Production-Circulation, what appears is circulation: "the commodity-world (Warenwelt), the circulation of commodities".[48]

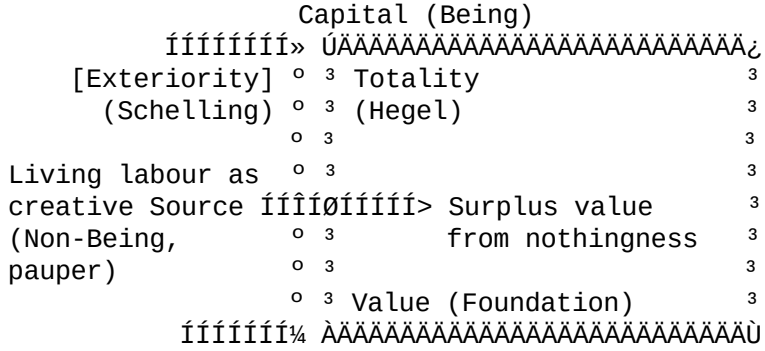
j) Unity of Essence-Existence (Reality)[49] and realization of capital. For Hegel "Reality is the unity [...] of Essence with Existence".[50] For Marx "realization" (Verwirklichung) of value (of the Being) is the unity process between Production and Circulation: the value (surplus value) appears as price (profit): "The capitalist process of production taken as a whole represents the unity (Einheit) of the processes of production and circulation".[51]

With what has been said, I believe we have enough to prove the massive presence of the Hegelian framework in the Capital. Let us now move to a newer subject.

§ 2. The "creative source" in Schelling and Marx: surplus value[52]

It is known that Marx wrote, "I have taken the liberty of adopting towards my master [Hegel] a critical attitude, of unburdening his dialectic from its mysticism and to let it experience a profound change".[53] Let us see now, what is Marx's rupture with Hegel. It is the global transformation of the logic, of Hegel's Logic. This transformation is produced in the already mentioned "pass over" (Uebergehen) from Money to Capital. Let us go into this subject in detail.

Same categories used by Marx



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a) From Being as Foundation to creative Source of Being. In 1841 Schelling gave in the University of Berlin certain famous lectures on Philosophy of Revelation. There were more than five hundred students (among them Feuerbach, Kierkegaard, Bakunin, Savigny, J. Burckhardt, A. von Humboldt, Engels and many others). It was a generational rupture with Hegel. This is the point of departure of Kierkegaard and Feuerbach's critical works and, from the latter, to Marx. The subject discussed by Schelling, was considered by Engels as extremely reactionary -and Lukacs himself thinks that it is the origin of the 19th century irrationalism. However, Schelling said something very simple against Hegel, something which made history:[54] "What is the beginning of (Anfang) all Thought, is not yet the Thought".[55] And continued: "The beginning of positive philosophy is that all Thought presupposes the Being".[56] But, to end, Schelling wanted to prove that even before the Being, there is Reality, as a prius of Thought and of Being, when he asserts, from a creationist doctrine: "The Absolute consists in being the Lord of Being (Herrsein über das Sein), and it is the greatest function of philosophy to pass over from pure Being (tò ón) to the Lord of Being (Herrn des Seins)."[57]

For Schelling, thus, there is a "creative source of Being from nothingness",[58] which through "positive revelation" manifests itself in history as a "source of knowledge" (Erkenntnissquelle),[59] "which must not be represented as unfounded knowledge, but of which one should more correctly say that it is the best founded of all".[60] Thus, following an old tradition, we are handling the beginning of all philosophical discourse from the Absolute itself.[61] Starting from the neoplatonics, it makes reference to Nicolas de Cusa's doctrine on the contractio Dei. Schelling does not assert absolute Identity; he shall defend the non-identity of Being and Reality. The Absolute operates as the creative Source from nothingness. Being is the Foundation, but beyond Being is the creative Source (Quelle) of Being. Being is an effect of the creative Source. Marx uses those types of categories in his critique of Political Economy.

b) Production and Creation of Value. Value is the Foundation (Being) of capital. This Foundation is in process: it is the valorization of value. Labour is the substance (in Hegelian sense) of all value. When a worker works, he "reproduces" the value of salary in the necessary time. The reproduction of the value of salary is production from the Foundation of capital (the value of salary is from capital). But in the surplus-time of the surplus-labour the worker creates from nothingness capital, because he has no value-capital Foundation (works without a salary). This kind of "making" a product (commodity) without being founded in capital is what Marx technically calls: "creation of value" (Wertschoepfung). Marx systematically begins his discourse, in Chapter 1 on the "Transformation of money into Capital", of Manuscripts 61-63 and also in Manuscripts 63-65, which shall become Chapter 2 in 1866 and in Section 2, Chapter 4, in 1872:

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[48] Capital II, Chap. 18; Marx, 1956, MEW 24, p. 352; p. 356.

[49] Wirklichkeit may be translated differently, but I prefer to use the word "reality". "This realization process (Verwirklichungsprozess) is at the same time the de-realization process (Entwirklichungsprozess) of labour" (Grundrisse IV; p. 358; p. 454).

[50] Enzykl., § 142; p. 279; p. 200.

[51] Capital III, Chap.1; Marx, 1956, MEW 25, p. 33; p. 19.

[52] See Dussel, 1991, § 3.

[53] Manuscript IV, A 65, 1867; see Dussel, 1990, p. 200-201, on the second volume of Capital, Rubel, Spanish translation, Appendix I, Capital, Siglo XXI, México, 1987, v. II/5, p. 658, Note 20).

[54] See the subject in "From the definitive Hegel to the old Schelling", in Dussel, 1974, pp. 116ff.

[55] Lesson 1 (November 15, 1841), XII, Schelling, 1977, p.161.

[56] Ibid., IX, p. 156.

[57] Ibid., XII, p. 172.

[58] See this subject in my already mentioned work, Dussel, 1974, pp. 116-128. In this sense also. "God (the real and creator) is beyond the absolute idea", Schelling, 1927, vol. 5, p. 744.

[59] Schelling, 1927, v. 6, p. 398.

[60] Ibid., p. 407. Schelling writes that "the negative philosophy tells us of what beatitude certainly consists, but it does not help us to achieve it." Einleitung in die Philosophie der Mythologie, II, lec. 24; Ibid., v. 5, p. 749, note 4. Are we not remined of Marx's Thesis 11, the Thesis on Feuerbach?

[61] See Habermas, 1963, Chap. 5, pp. 172ff.

"Our friend, Moneybags, must be so lucky to find [...] a commodity whose use-value possesses the peculiar property of being a Source (Quelle) of value, whose actual consumption, therefore, is itself [...] a creation of value (Wertschoepfung)."[62]

The "living labour" is this "Source" (Quelle) from which the "creation" (Schoepfung) of value derives. It is the Schellingian subject to which we have made reference. It is the creationist theory turned into critical economy. Marx writes that "the creation (Schoepfung) of this value, which he appropriates above and beyond the reproduced capital, is not presented as the Source (Quelle) of the surplus value".[63] Or: "The worker [...] has the possibility of beginning it again from the beginning, because his life (Lebendigkeit) is the Source (Quelle) in which his own use value constantly confronts capital again in order to begin the same exchange anew".[64] So, surplus value is creation "from nothingness" (ex nihilo, aus Nichts)[65] of capital. Or, and this is my theses:

"What it produces in addition is not reproduction (Reproduktion), but rather a new creation (neue Schoepfung) and, more specifically, the creation of new value (neue Wertschoepfung), because it is the objectification of new labour time in a use value."[66]

c) Negativity of poverty. Only from the positivity of living labour (which in addition includes the dignity of "corporeality" [Leiblichkeit], "personality lives" [lebendigen Persoenlichkeit]),[67] can one understand the sense of the first "negation", as a condition of the possibility of capital:

"Labour posited as not-capital (Nicht-Kapital) as such is: [...] Not objectified labour, conceived negatively [...] not-raw-material, not-instrument of labour, not-raw-product [...] This living labour (lebendige Arbeit) [...] This complete denudation, purely subjective existence of labour. Labour as absolute poverty (absolute Armut): poverty not as shortage, but as total exclusion (voelliges Ausschlissen) of objective wealth."[68]

Categorially, before the capital, the "system" or totality (of the "Being" or the "Foundation"), in its Exteriority by anteriority, we already find the pauper ante festum,[69] in its absolute negativity: it has nothing outside its own living personal corporeality, its empirical materiality (starting and arriving point of Marx's "ethic materialism"). Criticism, thus, starts from the first negativity of the victim: the future creator of wealth has nothing; or only has "an objectivity which [not] falls outside the immediate existence (Dasein) of the individual himself":[70] it is a naked poor;[71] it is "nothingness"[72] or anterior negativity, fruit of abandonment of the "rural community" and entrance to the strange urban "social" relationship.

d) The positive creative Source of surplus value. The living labour, being on the one hand the "absolute poverty", is, on the other, the "creative Source" of all surplus value:

"Not-objectified labour, not-value, conceived positively [...] is the subjective existence of labour itself. Labour [...] as activity; not itself value, but as the living Source of value (lebendige Quelle des Werts)".[73]

Capital, in its totality, is value from which surplus value is "valorization of value". But this "valorization" is a creation from nothingness of capital, from the living Source of new value: from the living labour and not from capital. The fetish claim of capital is to be the creative Source of surplus value (and profit):

"It [capital] relates as the foundation (Grund) to surplus value, as producer of value. It relates as the foundation to surplus value as that which is founded (Begruendetem) [...] Surplus value appears no longer to be posited by its simple, direct relation to living labour (lebendige Arbeit) [...] It [capital] relates to surplus value [...] as Source (Quelle) of production, to itself as product."[74]

I believe I have sufficiently suggested the thesis that living labour is the creative Source of surplus value, essential subject in which Marx inspires himself in Schelling (directly or indirectly) and ontologically separates from Hegel, for whom the Essence (the capital) is the same as the Being (value) in all its process.[75] For Marx the capital in the beginning of the production process is not the same than at the end. In the process of production capital subsumes a creative Source of surplus value, living labour that creates in capital something from the nothingness of capital. Beyond the Foundation of capital, living labour as originating Source creates surplus value.[76]

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[62] Capital I, 4 (6); (1872) p. 183; p. 164.

[63] Grundrisse II; Marx, 1974, p. 451; p. 553.

[64] Ibid., p. 194; p. 283.

[65] See Capital III, Chap.1; MEW 25, p.48: "...Schoepfung aus Nichts...".

[66] Ibid., p. 264; p. 359.

[67] Capital, pag.cit.

[68] Grundrisse II, Marx, 1974, p. 203; pp. 295-296.

[69] See my work: Dussel, 1985, pp.137ss, where we comment in detail all these texts.

[70] Grundrisse II, p. 203; p. 296. It seems as though we were reading Kierkegaard: "of the individual himself (des Individuums selbst)".

[71] Metaphore used by Marx, in the Book of the Death of Egypt or, afterwards, by Emmanuel Levinas. The immediately naked corporality of the skin: "The one with an air of importance, smirking, intent on business; the Other, timid and holding back, like one who is bringing his own hide to market and has nothing to expect but -a hiding." Capital, I, Chap. 4 (1972); Marx, 1975, MEGA II, t. 6, pp. 191-192; p. 172).

[72] "The abstract existence of man as mere workman who may therefore daily fall from his filled nothingness (Nichts) into the absolute nothingness (absolute Nichts)." Manusc. 44, II; Marx, 1956, MEW 1 EB, pp. 524-525; p. 122). The first "nothingness" (the filled) is the one of the worker in the Previous Exteriority, in poverty, hunger, the danger of death, if not "bought" for some money. The second "nothingness" (the absolute) is the effect of the "subsuntion" within capital (active negation: properly said, alleniation).

[73] Grundrisse II, p. 203; p. 296.

[74] Grundrisse VII; pp. 631-632; pp. 745-746.

[75] In politic economy it would be said thus: a) For the Hegelian ontology, capital has as Ground the value and profit is produced from this Ground. For Marx, in difference, capital has as Ground the value, but profit is not produced from this Ground; profit is the appearence of surplus value created by living labour, the creative Source of new surplus value, beyond the Ground of capital.

[76] The living labour (lebendige Arbeit) is not the labour force (Arbeitsvermoegen or Arbeitskraft). The "labour force" has value (it is founded in capital and it is reproduced by salary); but the "living labour" has dignity, no value; it is the substance of value (and because of that it can have no value) and the creative Source of surplus value: "Labour is the substance, and the immanent measure of value, but has itself no value (keinen Wert)." Capital I, Sect.VI, Chap.17; MEGA II, 6, p. 500; p. 503).

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RECENT DEVELOPMENTS IN THE LABOR THEORY OF VALUE

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1 Introduction

The labor theory of value presents one of the most puzzling and intriguing phenomena in the history of thought. Its emergence in the late 18th and early 19th centuries as a coherent basis for economic analysis grounded the penetrating and fertile development of Classical political economy which found its peaks in the work of Adam Smith and David Ricardo, and the equally fertile critique of Karl Marx. From this perspective the labor theory of value parallels the philosophical and theoretical innovations of Galileo and Newton in the physical sciences as the founding idea of a science.

But economics, apparently not comfortable with so powerful and deep an analytical foundation, curiously insisted on attempting to refound itself on the shallow and superficial framework of supply and demand concepts. This turn of events is all the more curious and puzzling when we consider that the Classical political economists and Marx were perfectly aware of supply and demand reasoning and methods1 give powerful amid persuasive arguments for the need for a deeper foundation for economic theory, and convincingly subsume supply and demand reasoning into the framework of the labor theory of value. The current theoretical sterility and scholasticism of "mainstream" economic theory based on supply and demand concepts, which at the present time calls into question the integrity of economics as a theoretically based discipline, stems, in my opinion, from this strange moment in the history of the development of economics

That we are here to discuss the labor theory of value at all in the face of powerful hegemonic attempts over at least a century to suppress its serious development is a testimony to the theory's vigor and intuitive appeal. But the intuitive strength of the labor theory of value has also turned out to be its Achilles heel; different facets of the theory have gripped the imagination of different scholars; and it has proved to be difficult to stabilize a coherent, broadly conceived research programme stemming from the core insights of the theory and building constructively on them.

The task of articulating and implementing such a research program has been complicated to some degree by the parallel, and in many ways more successful, effort by historians of economic thought to reconstruct the methods, arguments and conclusions of Smith, Ricardo and Marx. The complication takes the form of a dual dialogue (in extreme cases, unfortunately, a dialogue of the deaf) in which some participants are primarily concerned with an accurate rendering of the positions of these towering figures, and others are primarily concerned with finding a viable path for a progressive contemporary research program in economics. The tensions between these two aims is particularly acute in the Marxist literature, which has been strongly influenced by scholars' emotional identification with Marx and desire to appropriate his prestige for

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their particular contemporary political purposes. Thus the Marxist literature seems to set itself the formidable problem of finding an interpretation and reconstruction of the labor theory of value which is simultaneously an unimpeachable representation of Marx's own views and a foundation for a progressive economic research program.

In this paper I will attempt a brief and necessarily idiosyncratic account of the development of the labor theory of value and the recent developments in this tradition of which I am aware. I will strive to separate clearly the issue of the history of thought reconstruction of past opinions from the issue of recovering the energy and power of the labor theory of value for contemporary economic analysis. My own interest is primarily in the latter project, and the reader should take my remarks on history of thought issues with an appropriate recognition of my amateur standing in this field. The key question for me in considering any theory, amid the labor theory of value and its numerous interpretations in particular, is to understand what questions the theory is intended to answer. A great deal of the confusion and lack of consensus in the discussion of the labor theory of value seems to me to be traceable to the failure of participants to make explicit their often divergent positions on this question.

2. Smith and Ricardo

Smith, Ricardo and Marx each used the labor theory of value in his own way and to his own purposes. Each emphasizes, therefore, the facet of the theory most relevant to his own vision. As a result we have recognizably different, but not inconsistent, "labor theories of value" in these three authors.

Adam Smith's (1776) great theme was that the prosperity and wealth of nations arise from the energy, cleverness amid pragmatism of their people. The two foils Smith chose so effectively to make this point were the physiocrats and the mercantilists. Thus for Smith the primary function of the labor theory of value was to locate the source of wealth in the productive activity of the population rather than in the god-given fertility of land or its hoards of treasure. Masterful pedagogue that he was, Smith bolstered this vision with parables like the exchange of beaver for deer in the primeval forest in which the link between labor time and the production of wealth is transparent. He also appealed to his largely idle upper-class students' distaste for useful employment by asserting (echoing Genesis) that the discomfort and tedium of productive effort was the fundamental price humanity had to pay for meeting its imperious bodily needs. For Smith the labor theory of value is a return to fundamental realities of human existence, a way of redirecting the attention of his audience from ways to take already produced wealth away from others through interest or rent, toward projects for creating wealth through the organization of productive labor.

For Smith the aim of economics was to provide his audience with a psychologically convincing understanding of their economic experience and a satisfying account of the relation of their efforts to the system of social economy. The labor theory of value served him admirably in this respect, assuring his audience that its historical economic fate was indeed in its own hands, and not predetermined by the fate of national resource endowments or control over gold and silver deposits. Smith's pursuit of a framework for a quantitative scientific measurement of economic phenomena like price and output was secondary to this goal, and as a result lie was less interested, and less successful, in developing the quantitative side of the labor theory of value. Smith clearly understood that when the introduction of property rights created a scarcity of land and the development of technology a scarcity of means of production, rent and profit would prevent commodities from exchanging at prices proportional to the labor expended hi their production. This observation, however, had no relevance to the main theme of Smith's labor theory of value, that human activity rather than natural endowment of resources or treasure is the spring of prosperity and wealth.

Ricardo begins his book on Political Economy (1817) with a whole-hearted endorsement of Smith's work. He raises one criticism, that Smith's account of natural price as the adding up of natural levels of wages, profits, and rents is inconsistent with the labor theory of value itself. This observation leads Ricardo to the elaboration of the labor theory of value as a logically consistent framework for the analysis of the distribution of the value of the product between wages, profit and rent. The logical power and analytical persistence which Ricardo deployed in this argument have understandably impressed his readers, including Marx, to the point of astonishment.

For Ricardo the labor theory of value provides the crucial image of the determinate totality of economic value production, which then allows for the rigorous deductive analysis of its division into functionally relevant parts. Ricardo's labor theory of value provides him with an analytical equivalent to a "'general equilibrium" perspective that enforces a consistent accounting of flows of value and immediately focuses analytical attention on issues of opportunity cost and trade-offs between income shares. The labor deployed in an economy in a given period can be allocated among various employments, but puts. a determinate limit on output and the value claims to output in wages, rent and profit. In particular, a rise in one of the income categories must, holding the labor force deployed constant, come at the expense of the other two, a point that was of central importance to Marx. It is worth noting that the history of economic thought to the present offers no alternative to Ricardo's method except its generalisation in Walrasian equilibrium theory to the postulate of fixed supplies of an arbitrary list of productive inputs.

Ricardo, like Smith, was aware that remit amid profit could force long-run equilibrium prices of commodities away from proportionality to the labor embodied in them. It was greatly to his expository advantage to work out cases where these disproportionalities were absent or negligible, since in this case the logic of the determination of the distribution of the value of the product between wages, rent and profit is transparent and immediate. In some places Ricardo adopts the position that in reality the divergence of natural prices from embodied labor coefficients is small and of secondary analytical importance, so that results obtained by reasoning in the special case of proportionality are approximately correct in reality. This maneuver, reasonable as it undoubtedly is, did not entirely satisfy Ricardo's passion for logic, and he tried to supplement it with a more general analytical method based on an invariable standard of value", either a real commodity or a weighted basket of real commodities for which distributional implications of the labor theory of value would hold exactly.

What Ricardo got right is much more important than what he got wrong, both analytically and in terms of his future influence on the development of economics. The concept of the determinate whole, misleading as it may be for many economic questions, has remained the key to the analytical tractability of rigorous economic theory. This essential point in Ricardo's labor theory of value, which was its defining characteristic at

its inception, provides the foundation for modern general equilibrium and growth theories. A subsidiary feature of Ricardo's theory, the analysis of cases in which commodities exchange at natural price ratios proportional to the labor embodied in them, only came to define it in contrast to its own generalization in retrospect.

3 Marx's Labor Theory of Value and Historical Materialism

The intellectual world of Karl Marx's youth was dominated by the "problem" of linking the apparently arbitrary turmoil of human history to the orderly abstractions of religion and philosophy. The great intellectual figures of this period, especially Hegel, formulated their ideas in terms of proposed solutions to this puzzle. The young radical group of which Marx and Engels were a part all found their way to a rejection of traditional religious answers to these questions. Marx and Engels made a further leap to the vision of "historical materialism", which located the driving forces of history in the real activities and relations of human beings rather than the revelation of divine will or the unfolding of the absolute idea.

Marx had considerably developed his ideas about history before he began the serious, almost obsessive, study of economics that consumed that latter years of his life. The idea that societies organized themselves into classes based on control of surplus production played the central role in his thinking. Marx saw, in Western history at any rate, a repeated pattern in which political and social power, and their associated cultural manifestations in religion, literature, and art, rested on the appropriation of the share of output in excess of the basic reproductive requirements of the society by a minority. Marx proposed that the key to understanding basic evolution and change in human societies lay in uncovering the exact mechanisms through which ruling classes secured the control of surplus production, and the "contradictions", or instabilities making for change, that these mechanisms implied.

Marx had also early on concluded that the capitalism spreading over Europe in his life was an instance of this general pattern of class organization of society, in which capitalists were able to use their advantage as owners of the means of production to appropriate the surplus product. The main differences between the capitalist mode of production and earlier class societies stemmed from the structural incentive to restless innovation imposed on capitalist society by its competitive market structure. Marx saw this innovation leading to gigantic increases in the volume of the surplus production over the reproductive requirements of the society, and hence to a qualitative change in the situation of the human race on the planet. It also institutionalized the instabilities that produced revolutionary contradictions in past societies, and thus ushered in a historical period of unprecedentedly rapid and fundamental social and political change.

Some of these beliefs, particularly those concerning the class organization of European capitalist society in the first half of the 19th century, were widely shared by informed members of all classes, even by many fierce defenders of property, privilege, and inequality. This ideological situation changed sharply in the last half of the 19th century, when the problem of managing the social stresses of capitalist economic development took center stage in the politics of Europe, and the rhetorical maneuver of denying or minimizing the class divisions of society began to have wide appeal.

Marx encountered Classical political economy and the labor theory of value in the works of Smith and Ricardo with the theory of historical materialism already well-developed as the basis for his historical and political analysis of his own time. What he saw in Ricardo's version of the labor theory of value fit the perspective of historical materialism perfectly. The classes of landowners and capitalists control the surplus product of capitalist society by appropriating rent and profit from the stream of value produced by labor. The wages paid to workers compensate them for only a part of their entire labor effort, their paid labor time, while the surplus value appropriated by the capitalists (and perhaps then extorted from them by landlords) represents unpaid labor time, or exploitation. The appropriation of surplus product, so immediate, transparent and personal in slave- and serf-based societies, is translated to the level if the social whole and mediated by the money form of value and competition. Smith and Ricardo's value theories join the theory of historical materialism like two large parts of an unfinished jigsaw puzzle that one suddenly recognises as the completion of each others ragged edges. Historical materialism provides the rational foundation for the study of capitalist political economy. Classical political economy in turn fills in many gaps in the historical materialist account, offering a clear theory of the mechanisms of surplus appropriation in capitalist society, the key to understanding the emancipation of labor from serfdom and slavery, the technologically progressive bias of capitalist competition, and adumbrating a host of other specific problems.

Thus, in my view, (see Baumol, 1974, for a discussion supporting this interpretation) the important issue to keep in mind in considering Marx's labor theory of value is its role as a particular instantiation of the general principles of class society revealed by the theory of historical materialism. Marx deployed his critical intelligence to sharpen and disambiguate Ricardo's account of the labor theory of value. For example, Ricardo never consistently articulated his theory of money with the labor theory of value, but adopted a quantity of money theory of prices that is inconsistent with the production cost theory of the value of a commodity money like gold implied by the labor theory of value. Marx followed Ricardo's quantity theory ideas uncritically in early works like the German Ideology, but, with the help of critics like Thomas Tooke, formulated a consistent theory of money in the Critique of Political Economy (1859) and Capital (1867). Furthermore, Marx propounded a unified theory of labor, value and money, in which) labor is the substance of value and money its expression, and in the notoriously difficult first 3 chapters of Volume I of Capital (1867) managed to derive this unified theory from the dual nature of the commodity as use-value and exchange-value we find already in Adam Smith.

Marx also took the trouble to correct explicitly some of the casual language in Ricardo's discussion of the labor theory of value. He made explicit the point that wasted labor expended in backward conditions of production did not add value proportionately to the commodity (as I am sure Ricardo knew, and took implicitly for granted), thus introducing the category of "socially necessary" labor into the analysis. He elaborated slightly Ricardo's remarks on the need to reduce labor of different qualities to a common measure, which Marx called "simple" labor. He was able to link his own historical interests with the foundations of the theory by pointing out, in implicit contrast to Smith, that private labor expended out of contact with the market could produce only use-value, and not exchange-value-value, so that value producing labor must be "social" rather than "private."

The full implications of Marx's synthesis of the labor theory of value with the theory of money are far-reaching and to this day only dimly and partially grasped even by the ideologically beleaguered community of Marxist economists. For the purposes of the further discussion in this paper, the most important consequence is the firm establishment of an equivalence between money value measures such as the dollar, pound, yen or mark, and social labor time. This equivalence is prior to and consistent with particular monetary systems, such as commodity-money systems like the gold standard, or the state-credit money systems widespread in the late 20th Century. Whatever the particular monetary system, Marx's theory implies the existence of a quantitative equivalence in any particular period between the monetary unit and social labor time.

I will call this the "monetary expression of labor" (abbreviated MEL), which has the dimensions of $ (or other currency units) per hour (or other time unit) of labor. Marx constantly uses this conception to move back and forth between money and labor accounts. A particularly telling example is the first chapter of Volume III of Capital (1894), where Marx uses this concept freely in the context of a discussion of economies with unequal organic compositions of capital, and hence where prices of production of particular commodities (Marx's reconstruction of Smith's "natural prices") need not be proportional to the labor embodied in them.[78]

In Volume I of Capital Marx clearly states that actual market prices as well as natural prices or prices of production may not he proportional to embodied labor coefficients in general, and equally clearly, in my opinion, continues to use an MEL coefficient to translate back and forth between labor time and money price accounting. From this I conclude that Marx saw no possible difficulty arising for his monetary elaboration of the labor theory of value from disproportionalities between money prices and embodied labor. The overarching main point in Marx's vision is that the system of commodity exchange based on money is simultaneously a system of distribution of social labor time.

These considerations lead to the conclusion that the labor theory of value for Marx was a theory of exploitation and of money, not, in the first instance at least, a theory of relative prices. That Marx was aware of the problem of reconciling the labor theory of value with the phenomenon of prices disproportional to embodied labor coefficients, as the first section of Volume III of Capital testifies.

4 Prices of Production

Smith explains the working of competition in capitalism as process in which capital flows from sectors experiencing (or, presumably, anticipating) a low rate of profit relative to the average for the economy as a whole to sectors experiencing a relatively high rate of profit. This movement of capital then acts through the mechanism of supply and demand to raise prices (and consequently profit rates) in the originally low profit rate sectors and depress prices and profit rates in the originally high profit rate sectors. Smith also recognized that the implicit equilibrium or rest point of this dynamic process, a configuration of prices consistent with equal rates of profit in all sectors, which he called "natural prices" would never in reality be achieved because of ceaseless disturbances to technology and demand. Thus in Classical political economy natural prices regulate the actual fluctuation of market prices as a long-run average (or, in more Classical language, as a "center of gravity"). It is not hard to see that a system of prices that will equalize profit rates in all sectors at a positive level will be proportional to the labor embodied in the sectoral outputs only if all sectors have the same invested capital per labor input. Ricardo had already tried to reconcile the insights of the labor theory of value with the Classical theory of competition through the analytical device of the "invariable standard of value." Ricardo seems to have regarded this issue as one of approximation: he saw his strict labor theory of value as a good first approximation to the description of a real economy, and its fundamental insights into the dynamics of distribution as generalizable to more realistic models.

Marx addressed the problem of the disproportionality between profit rate-equalizing prices and embodied labor coefficients in notes written before the publication of the Volume I of Capita1 which Engels later published as sections 1 and 2 of Volume III of Capital These notes make Marx's general idea of how to deal with the problem quite clear, but leave a number of methodological details obscure. The general idea is that competition among capitals redistributes value produced from one sector of capitalist production to another and indeed from one producer to another, without, however, altering the aggregate value produced nor the rate of exploitation measured as the ratio of surplus value in all forms appropriated by the capitalists to the variable capital they advance as wages to workers. If this step in the argument is valid, Marx can rigorously "abstract" competition from the analysis to reason purely in terms of value flows proportional to embodied labor, and then "turn on" competition or, indeed, any other price formation process, including supply and demand, without changing any of the relations between aggregate value flows determined in the first stage of the analysis. One way to put this is that Marx was looking for a principle of conservation of produced value in exchange. Since these aggregate value flows are the point at which political economy touches historical materialism, this method of abstraction preserves the integrity of Marx's initial vision.

When Marx turned to the drafting of Volume I of Capital, he reduced the discussion of the problem of competition and price formation to a few rather cryptic remarks about the possibility of disproportionalities between money market prices and embodied labor coefficients. The most explicit of these reads as follows:

> …although price, being the exponent of the magnitude of a commodity's value, 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....
>
> Magnitude of value expresses a relation of social production, it expresses the connexion that necessarily exists between a certain article and the portion of the total labour-time of society required to produce it. As soon as the magnitude of value is converted into price, the above necessary relation takes the shape of a more or less accidental exchange-ratio between a single commodity and another, the money-commodity. But this exchange-ratio may express either the real magnitude of that commodity's value, or the quantity of gold deviating from that value, for which, according to the circumstances, it may be parted with. The possibility, therefore, of quantitative in-congruity between price and magnitude of value, or the deviation of the former from the latter, is inherent in the price-form itself. This is no defect, but, on the contrary, admirably adapts the price-form to a mode of production whose inherent laws impose themselves only as the mean of apparently lawless irregularities that compensate one another. (Marx, 1867, 101-102.)

[78] The monetary expression of labor is the inverse of what I called (Foley 1982b, 1986a) the "value of money". Although the phrase "value of money" is used by Marx in exactly the same sense, it has been criticised by a number of scholars for its imprecision and ambiguity, so I will move to the innovative and less graceful, "monetary expression of labor" in the interests of clarity

An alternative translation (due to Jens Christiansen) of the first part of this passage, which is unusually obscure, is "When price expresses the value of the commodity it does so by expressing the commodity's exchange ratio with money; but it does not follow that the exchange-ratio with money always expresses the commodity's value."

At least four different readings of the first three chapters of Volume I of Capital are possible, contributing to a disproportionality between the volume of writing on these passages and the level of consensus on their meaning we have achieved.

The first three chapters of Volume I of Capital can be read as analyzing a precapitalist system of "simple commodity production" which abstracts altogether from the social and class relations of capitalism, so that commodities exchange in proportion to their embodied labor because of the competition of the direct, labor-expending producers. This view sees these chapters as Marx's equivalent of Smith's primeval forest in which beaver and deer exchange ill proportion to the labor required to find and kill them. This reading then raises the question, which Marx does not explicitly address, of the degree to which its conclusions generalize once capitalist social relations and capitalist competition are acknowledged.

Or, the first three chapters of Volume I of Capital can be read as analyzing completely developed real capitalist social relations including the tendency for competitively equalized profit rates under the special assumption that the capital invested per unit of labor is uniform across sectors, so that profit-rate equalizing prices will be proportional to embodied labor inputs. This reading also raises the question of which of the conclusions can be generalized to once the structure of capital is allowed to vary across sectors. Unfortunately Marx himself never makes the assumption of equal ratios of invested capital to labor (or equal organic compositions of capital as lie refers to this ratio later) explicit.

Or, the first three chapters of Volume I of Capital can be read as analyzing the aggregate flows of value in an economy with fully developed capitalist social relations, competition, and arbitrary ratios of invested capital to labor across sectors, taking as proved the conservation of value in exchange. This reading, which underlies Foley (1986a), for example, requires us to interpret Marx's reference to individual commodities in the initial chapters of Capital as referring to "average" commodities representing the aggregate value flows in the economy as a whole. This reading has the advantage over the first two of avoiding the need to establish the general validity of the results; if the conservation of value in exchange holds, the generalisation is immediate, no matter what forces may affect money prices of commodities.

Or, the first three chapters of Volume I of Capital can be read as analyzing flows of value in an economy with fully developed capitalist social relations, and allowing for arbitrary ratios of invested capital per unit of labor across sectors, but abstracting from the tendency for competition to equalize rates of profit (indeed, abstracting from all phenomena that might lead to a disproportionality between money market prices and embodied labor coefficients.) This reading runs afoul of Marx's observations about the possible quantitative incongruity of prices from labor embodied, but in other respects has many strengths. Like the reading described in the last paragraph it dispenses with the need for generalization to introduce either capitalist social relations or arbitrary organic compositions of capital. But it does leave open the question of the degree to which the conclusions generalize once competition and other forces are allowed to influence market prices. In this case the general validity of the analysis of value flows in capitalist economies as rigorously representing a distribution of labor and thus of surplus product is not addressed in Volume I of Capital at all, but is contingent on the success of the analysis published as Part I of Volume III of capital This reading is consistent with other aspects of Marx's method (for example his treatment of rent, in which lie first analyses the operation of a completely developed competitive capitalist system abstracting from private appropriation of land and then introduces private ownership of land and the consequent emergence of rents.) But it leaves the historical materialist conclusions of Volume I of Capital hostage to the validity of arguments eventually published in Volume III. Would Marx, with his instinct for polemic and logical completeness of argument, have rested easy with this major loose end?

Our knowledge that Marx wrote the notes published as Volume III of Capital before preparing Volume I for publication only heightens the puzzlement over his failure find a graceful way to introduce his considerations on these issues into the exposition of Volume I.

When we turn to Volume III of capital we find Marx firmly in control of the capitalist accounting categories underlying profit and profit rate measures. He clearly distinguishes stocks and flows (through the category of turnover, which is developed at great length in the notes published as Volume II of Capital, 1893) and the definitions of accounting cost. The overall structure of his argument is also unambiguous: he intends to reconcile the phenomenon of prices disproportionate to embodied labor coefficients with the labor theory of value by viewing prices as simply redistributing a mass of value created in production among different sectors and firms, thus establishing the conservation principle necessary to link real capitalist accounts quantitatively to measures of labor time.

Marx confines himself to the methodologically weak procedure of giving numerical examples to illustrate his idea, rather than general arguments tending to establish the principles in general. The difficulty with numerical examples is twofold; first, they tend to express only a part of the whole situation the theories has in mind (so that Marx is not explicit about the actual flows of use-values that underpin his tableaux); and second, it is difficult to see immediately when features of a particular example reflect general principles, and which are peculiar to the numbers chosen. Marx's treatment of these tableaux is excruciatingly well-known: he presents systems specifying the constant capital, variable capital and surplus value in each of several sectors, first with the surplus value uniformly proportional to the variable capital, and then redistributing the surplus value so as to be uniformly proportional to the sum of constant and variable capital (on the hypothesis that capital turns over exactly once per period), without changing the total surplus value, These examples surely illustrate the idea that a redistribution of surplus value without any change in the total value added (s + v), or total value (c + V + s) can equalize sectoral profit rates (and, in the examples, conserve the social profit rate as well.) But they raise a number of methodological questions as well.

Marx himself raises methodological issues in chapter 9 of Volume III of Capital, which he fails to resolve and resorts to evasion to bring closure to. For example:

…Aside from the fact that the price of a particular product ... differs from its value because the surplus-value realised ... may be greater or smaller than the profit ..., the same circumstance applies also to those commodities which form the constant part of capital ..., and indirectly also its variable part, as the labourers' necessities of life. So far as the constant portion is concerned, it is itself equal to the cost-price plus the surplus-value, here therefore equal to cost-price plus profit, and this profit may again be greater or smaller than the surplus-value for which it stands. As for the variable capital, the average daily wage is indeed always equal to the value produced in the number of hours the labourer must work to produce the necessities of life. But his number of hours is in its turn obscured by the deviation of the prices of production of necessities of life from their values. However, this always resolves itself to one commodity receiving too little of the surplus-value while another receives too much, so that the deviations from the value which are embodied in the prices of production compensate one another. under capitalist production, the general law acts as the prevailing tendency only in a very complicated and approximate manner, as a never ascertainable average of ceaseless fluctuations. (Marx, 1894, 161.)

The last sentence appears almost to retreat to a position that there is no general rigorous quantitative relation between surplus value and unpaid labor time.

A few pages later we read:

The foregoing statements have at any rate modified the original assumption concerning the determination of the cost-price of commodities. We had originally assumed that the cost-price of a commodity equalled the value of the commodities consumed in its production. But for the buyer the price of production of a specific commodity is its cost-price, and may thus pass as cost-price into the prices of other commodities. Since the price of production may differe from the value of a commodity, it follows that the cost-price of a commodity containing this price of production of another commodity may also stand above or below that portion of its total value derived from the value of the means of production consumed by it. It is necessary to remeber that this modified significance of the cost-price and to bear in mind that there is always the possibility of an error if the cost-price of a commodity in any particular sphere is identified with the value of the means of production consumed by it. Our present analysis does not necessitate a closer examination of this point (1894, 164-65)

But the defense of the conservation of the value of the gross product in its price seems to require precisely a closer examination of this point.

Now it may have been the case that Marx, who was a brilliant person and saw many connections and unities that other people have difficulty in comprehending, had a clear, transparent understanding of the relation between prices and values that could rigorously resolve the sharp differences in language between the published Volume I and the unpublished notes that are the substance of Volume III of Capital, and that he could have satisfactorily answered all of the numerous questions later writers have raised about these matters. But it may also have been the case that Marx never completely resolved these issues satisfactorily in his own thinking, but, viewing them as essentially secondary to what he regarded as the indubitably correct and vitally important relation between the labor theory of value and historical materialism, published Volume I of *Capital* anyway. Even if Marx felt "subjectively" that he had resolved these issues (perhaps with the feeling that a few essentially technical issues still had to be resolved, but that he had established the correct method) it is not at all certain that he could have given satisfactory answers to the much sharper questions posed by later scholars possessed of a more general mathematical framework and better developed statistical and accounting methods. Since there is no sure way of settling these questions, I prefere to remain agnostic on them, and to pursue a critique of the labor theory of value that does not require one to take a position on them.

5 The Dual system

In his Preface to Volume II of Capital Engels announced that in Volume III he would reveal Marx's method of reconciling profit rate-equalizing competitive prices with the labor theory of value and issued a general challenge to the world's economist to discover or improve upon Marx's treatment in the intervening years. Since at least some of the world's economists (perhaps incautiously) took up this challenge, Engels' challenge ensured that the adequacy of Marx's analysis on this point would be the subject of intense critical scrutiny.

The first wave of critical attention to what became known as the "transformation problem" began with the assumption that Volume III of Capital was indeed a sequel to Volume I, written after Volume I and developing its thesis. (We now know that this assumption was wrong.) Thus the first commentators on Marx's analysis began with what they perceived to be an unambiguous identification in Volume I of Capital of the term "value" with the labor embodied in particular commodities (Marx, at least in English translation, does seem to me to use the word "value" in this sense consistently in Volume I.) This line of critical analysis, beginning with Tugan-Baranowsky (1905) and continuing through Bortkiewicz (1952), Sweezy (1970), Seton (1957), Morishima (1973), Samuelson (1971), Steedman (1977) and Roemer (1981), among others, attempts to reconstruct the notion of the labor embodied in a commodity from Volume I of Capital on a rigorous basis and to use the resulting analytical concept to test the generality of Marx's analysis of prices of production in Volume III mathematically.

The aim of these writers was to demonstrate what they believed to be an inconsistency in Marx's argument. It is clear from Marx's writing that lie believed that his method of reconciling prices with the labor theory of value was completely general, in that it could apply to any real capitalist economy, without special assumptions as to turnover rates, the organic composition of capital, the mechanisms of competition, stationarity of prices, the rate of technical change, the existence of joint production, and so on. A completely satisfactory understanding of these issues ought to have this level of generality. In order to demonstrate a logical inconsistency in Marx's method, however, it is necessary only to show its inadequacy in some particular setting, even if that setting is extremely stylized, abstract, and unrealistic. Thus these critics of Marx's interpretation of the labor theory of value can make their case without taking the responsibility of putting forward a positive and general theory of price formation in capitalist societies.

In the interests of expositional economy and to prepare the way for some of the discussion in the later sections of this paper, let me introduce a particular model and some algebraic notation at this point. Let time pass in discrete periods t =0, 1,… Suppose we are dealing with a capitalist economy in which n commodities, distinguished by subscripts i or j are produced with an unchanging technology described by an $n \times n$ matrix A whose element A_{ij} represents the amount of commodity i required at the beginning of a period to produce 1 unit of commodity j at the end of the period, and a $1 \times n$ vector 1 where l_j represents the amount of labor required during the period to produce 1 unit of commodity j. We will write the jth column of the matrix A as A_j. This technology has a fixed rate of turnover of capital equal to 1. Then if the matrix I–A is nonsingular, it is possible to calculate a $1 \times n$ vector of embodied labor coefficients, A, which represent the direct and indirect labor embodied in each commodity:

$$\lambda=\lambda A+l$$

$$\lambda=l(I-A)^{-1}$$

If the $n \times 1$ vector x represents the gross output of the economy, then lx is the total living labor input, and Ax is the labor embodied in the gross output. The net output of the

economy, allowing for the productive consumption of the inputs Ax, is $y=(I-A)x$, and $Ay=lx$ is the labor embodied in the net output. Let us assume that each worker expending a unit of labor consumes a bundle of commodities represented by the $n\times1$ vector b. Marx's constant capital in these embodied labor coefficient accounts is $c_\lambda=A\lambda x$, variable capital, assuming that workers are 1)aid just the equivalent of their subsistence, is $v_\lambda = \lambda blx$, and surplus value is $s_\lambda=\lambda(I - A - bl)x$. The sum $v_\lambda + s_\lambda = \lambda(I - A)x = lx$, which is just the living labor expended, so that we can regard v_λ and s_λ as the paid and unpaid portions of the living labor time.

This line of critique takes the embodied labor coefficients λ defined above to represent what Marx in Volume I calls the labor directly and indirectly embodied in the commodities under the stringent assumptions of the model. These embodied labor coefficients are unambiguously determined in their absolute magnitude by the technology, *A, 1*, so that no normalization of them is necessary.

It is worth noting, however, that this method of imputing labor to particular commodities will not work for joint products, since there is no unambiguous way to impute the labor input to the joint production process over its outputs. But the demonstration of inconsistency in Marx's method does not, as we have seen, require the analysis of general cases.

Suppose now that in a capitalist economy, workers expend the labor required in production as a result of having sold their labor-power to the capitalists for a money wage w paid at the beginning of the period of production, that a unit of labor-power sold yields the capitalist on average a unit of labor expended in production. Capitalists purchase inputs and sell outputs at stationary money prices represented by the $1\times n$ vector p.

At arbitrary prices p we can calculate the money price of gross output, px, the money price of net output, $p(I - A)x$, which is the same as the accounting value added measured in the net domestic product in national income accounting terms, the aggregate wage bill wix, and the money price of the non-labor inputs, pAx.

A capitalist producing a unit of commodity j has to lay out capital pA in order to purchase means of production (Marx's constant capital, c), and wl~ in order to purchase labor-power (Marx's variable capital v). She sells the output at price Pj, 50 that her profit (Marx's surplus value, s), π_j, is:

$$\pi_j = p_j - p_jA_j - wl_j$$

Since the rate of turnover of capital is unity, the capital she ties up is equal to her cost of production, $p_j + p_jA_j$ and her profit rate, r_j, is:

$$\frac{p_j(I-A_j) - wl_j}{p_jA_j + wl_j}$$

A system of prices of production and wages, p, w that equalizes profit rates across sectors must satisfy the matrix equation:

$$p = (1 + r)(pA + wl)$$

If we assume that the money wage, w is determined by the condition that it just allows the workers to purchase their subsistence wage b, we have w = pb, and we can eliminate w from the expression altogether:

$$p = (1 + r)\, p(A + bl)$$

This expression for the prices of production is homogeneous in the prices, so that if some vector p satisfies it, any positive multiple of p will also satisfy it, and thus requires some normalization. Using prices of production we can recalculate Marx's constant capital, $c_\lambda = pAx$, variable capital, $v_\lambda = pb1x$, and surplus value, $s_\lambda = p(I - A - bl)x$. This critique thus involves two system of accounts, embodied labor coefficients and prices, and has as a result been called a "dual system" interpretation of the labor theory of value.

How closely can we connect these two systems of accounts, one, c_p v_p and s_p based on prices of production and the other, c_λ, v_λ and s_λ, on embodied labor coefficients? Except in the "degenerate" case in which the sectoral ratios pA_j/pbl_j are all equal (Marx's case of "equal organic compositions of capital" in this interpretation) the vector $(c_p\ v_p\ s_p)$ is not proportional to the vector $(c_\lambda\ v_\lambda\ s_\lambda)$.Thus there is no monetary expression of labor, it, such that:

$$(\mu c_\lambda, \mu v_\lambda, \mu s_\lambda) = (c_p, v_p, s_p)$$

The adherents of this line of critique of Marx's method take this analysis, the mathematical correctness of which is unquestioned, to show that there is no rigorous quantitative connection between the labor time account arising from embodied labor coefficients and the phenomenal world of money price accounts. Thus for them the labor theory of value is valid only in the special case of equal organic compositions of capital Marx's argument in Volume III of Capita1, they conclude, fails to fill the logical gap adequately so as to generalize the labor theory of value to account for the complexity of real capitalist economies.

From this conclusion the various proponents of the critique draw quite different lessons. Some, like Michio Morishima, attempt to retail' a kind of shadowy underworld after-life for the labor theory of value by showing that the embodied labor accounting system reflects some aspects of capitalist reality, even though it distorts the picture qualititatively. Thus Morishima puts forward a "fundamental Marxian theorem" that the rate of profit in the price accounting system is positive if and only if the rate of exploitation in the embodied labor accounting system is positive. These interesting mathematical discoveries, however, fail to motivate the analysis of the embodied labor coefficients system by showing what explanatory power it has over observable phenomena.

Others, like Ian Steedman and John Roemer, retain a commitment to the historical materialist perspective, Find the logical case against the relevance of the labor theory of value unanswerable. This leads them to the positive research program of finding an alternative analytical structure in which to situate the theory of exploitation ill more modern conceptions of price theory, either Walrasian general equilibrium theory or Sraffa's theory of pricing.

Still others, like Paul Samuelson, prefer to see what they take to be the logical inconsistency of Marx's labor theory of value as a fatal flaw in the historical materialist theory of exploitation as a whole.

For my own part, I would remark on two points. First, this critical line of inquiry appears to establish that an interpretation of the labor theory of value based on imputed embodied labor coefficients does not lead at the purely theoretical level to a progressive research program. Second, this line of thinking somehow manages to ignore completely the monetary aspect of Marx's labor theory of value.

6 The Empirical Approach to Embodied Labor

The last 25 years have seen fertile and interesting empirical work stimulated by the embodied labor coefficients interpretation of the labor theory of value. This work, pioneered by Ed Wolff (for example, 1975 and 1987) and Anwar Shaikh, has been developed by Shaikh and E. Ahmet Tonak (1994) and other associates, among them Ed Ochoa (1988), and more recently extended by Paul Cockshott and Allin Cottrell and their collaborators (for example, Cockshott, Cottrell and Michaelson, 1995).

This line of empirical work uses Leontief's input-output tables to calculate imputed embodied labor coefficients and prices of production for real-world economies. The focus of analysis is to study how much empirical deviation there is between the embodied labor coefficients system of accounts and either price of production or market price systems.

In calculating prices of production from input-output tables care must be taken over the fact that the Leontief's A table records the flows of commodities between sectors, not the stocks of commodities tied up in production, which give rise to the denominator in the rate of profit. In order to calculate the prices that would equalize rates of profit on invested capital, these must be weighted, as Marx points out, by the appropriate rates of turnover for different classes of commodity. Some of the studies in this literature have failed to take account of this methodological point.

Considerations of space prevent me from reviewing the richness of empirical detail revealed by this literature, but its main finding is that by a number of statistical measures embodied labor coefficients are closely correlated with both prices of production and market prices across sectors in real capitalist economies. The main methodological question these studies raise is the appropriate statistical measure of correlation to use in this comparison.

Since replicable empirical regularities are rather rare in economics, the strong evidence these studies offer for a widespread coherence between embodied labor coefficients, prices of production and market prices is of indubitable scientific interest. Its exact theoretical significance and explanation, however, remains obscure. Some of the key figures in this tradition, for example, Shaikh, have not yet to my knowledge publicly discussed their views of the theoretical significance of this work in detail in relation to the issues addressed in this paper.

Other workers in this tradition, Cockshott and Cottrell, for example, argue that this empirical regularity provides the foundation for the scientific role of the labor theory of value. In this view, the empirical correlation between market prices and embodied labor coefficients supports the idea that embodied labor coefficients determine market prices, and motivates economic interest in the embodied labor coefficients and their evolution over time. This position raises some troubling questions from the perspective of Marx's own work. Suppose, for example, that the correlations between embodied labor coefficients and market prices had turned out to be much lower, or to fall over time, or to be low in certain capitalist economies. Are we to conclude that the labor theory of value does not hold, or is weakening over time, or holds only in some capitalist economies?

The empirical approach to reconciling embodied labor coefficients with real prices echoes to a considerable degree Ricardo's position that embodied labor is a good first approximation to 'in understanding of value and labor flows in real economies.

7 The "New Interpretation"

In the late 1970s Gerard Dumenil and I independently from each other suggested a reconstruction of Marx's labor theory of value emphasizing the relation between money and labor time that preserves the rigorous quantitative relation between paid and unpaid labor on the one hand and the aggregate wage hill and aggregate gross profit (including interest, rent, and business taxes) on the other. [79] This approach was rather uninformatively described as "The New Solution" to the transformation problem, and, after Dumenil's observation that it actually abolished the "transformation problem" as such, and thus wasn't really a solution to anything, equally uninformatively as "The New Interpretation".

Our intervention centered on the monetary expression of labor. We argued that the important issue for Marx was the idea that money represents social labor time, and that he can therefore use a measure of the monetary expression of labor appropriately defined at the level of the aggregate system of commodity production to translate flows of money in real-world capitalist accounts into flows of labor-time and vice versa. This way of looking at the labor theory of value dispenses with the need for a separate accounting system based on embodied labor coefficients.

We argued that the core content of Marx's labor theory of value was that the expenditure of living labor in production adds money value to the inputs to production. (Marx reiterates the point that the money value of inputs to production is merely preserved by living labor in the production process, and reappears unchanged in the price of the commodity.) The value added in production in an economy over any time period is a familiarly measured statistic, the net domestic (or national) product. Thus we concluded that the appropriate definition of the monetary expression of labor was the ratio of the net domestic product at current prices to the living productive labor expended in an economy over a period of time.

There are further important issues involved in applying this definition in practice. The measurement of net domestic product depends on deducting unreliable estimates of depreciation of fixed capital from the more precisely measured gross domestic product. (In practice the use of the GDP in place of the NDP in estimating the monetary expression of labor leads to an overestimate of the MEL, since GDP exceeds NDP by the amount of depreciation, but will not distort the time profile of the measurement very much as long as the share of depreciation in GDP is changing slowly.) Accepted national income accounting practice includes imputations of non-market transactions (such as the rental value of owner-occupied housing) that should in principle be removed from measures of NDP for the purpose of calculating the MEL. There are also issues of measurement of the denominator of the MEL, the living labor expended. In principle it is necessary to adjust total hours worked for the skill levels of workers, A variety of methods, some based on relative wage weights, and others on more direct measures of skill, have been proposed to make this adjustment. Not all employed labor in capitalist economies is productive in Marx's sense, so that in principle an adjustment should be made to deduct unproductive labor from the total living labor expended.80 In the rest of

[79] See Duménil (1980, 1983), and Foley, (1982b, elaborated in 1986a and 1986b.) Dum¶enil's work was brought to my attention and to the English-language literature through the article of Alain Lipietz (1982).

[80] See Edward Wol® (1987), Fred Moseley (1990) for a further discussion of this issue.

this paper I will assume (contrary to reality) that some agreement has been made on these measurement issues, so as to focus on the conceptual, definitional and interpretational problems of the monetary expression of labor.

It is important to notice that this definition of the monetary expression of labor, though it clearly links money and labor time, does not depend on any assumption about the particular monetary system operating in the economy. In particular, it works equally well for a commodity-money system like the gold standard, or for state-credit based monetary systems like those common in the late 20th century. This point underlines the fact that the definition of the monetary expression of labor in this way does not commit us to any particular theory about the definition of the MEL. In a gold standard economy the MEL could be determined by the price of newly produced gold relative to that of other commodities, for example, and in a state credit money system by speculation on the prospective solvency of the state. These determining mechanisms are quite different, but in each case money can be viewed as functioning (in part) to express social labor time quantitatively.

The monetary expression of labor permits us to resolve a wide range of other issues in the labor theory of value. Dumenil and I, for example, proposed that in general the "value of labor-power" should be measured as the ratio of the money wage to the monetary expression of labor, not as the labor embodied in the commodities workers consume. With this definition the problem of the identification of surplus value in the capitalist system as a whole with the unpaid labor of productive workers simply vanishes, since the paid and unpaid portions of the total expended labor are definitionally equal to the wage and gross profit share in the net domestic product. As a result, the rate of exploitation measured as the ratio of the gross profit share hi national income to the wage share in national income coincides with the corresponding ratio expressed in labortime equivalents. A moment's thought shows, in fact, that this definition of the monetary expression of labor and of the value of labor-power are the only definitions that will generally preserve the quantitative relation between surplus value in the form of the aggregate gross profit and unpaid labor.

To put the matter in a slightly different light, the New Interpretation proposes to define the relevant categories of the labor theory of value so that what we regarded as the key Marxian insight, the quantitative equivalence between capitalist gross profit and unpaid labor, holds. The "dual" approach to the labor theory of value outlined in the last section, in contrast, considers whether it is possible to deduce Marx's equivalence from other assumptions (such as the identification of the value of labor-power with the labor embodied in the workers' consumption). It is in this sense that the New Interpretation is an "interpretation" , not a "solution", since it proposes a particular definitional ordering of the key abstractions of the labor theory of value.

The New Interpretation definition" has some significant methodological advantages. It is completely general, ill that it is consistent with any theory of price formation (including, but not restricted to theories of profit-rate equalizing prices of production.) It opens the way to an interpretation of the substantive parts of Marx's theory (his discussions of relative surplus value, induced technical change in capitalism, and the long-term tendencies of capital accumulation, or his theory of the circuit of capital, for example) as testable empirical hypotheses that can be confronted with widely available statistical data. It opens up new avenues of empirical-theoretical work ill the Marxist tradition, such as an examination of the relation of national exchange rates to relative monetary expressions of labor. (See Mark Glick and Hans Ehrbar, 1987, and Simon Mohun, 1994 for further discussions of these points.)

In our initial attempts to explain the New Interpretation, Duménil and I both spent quite a bit of effort showing how it would work in the context of special models of production such as the pure circulating capital model of the last section. These expositional efforts unfortunately have misled some of our readers into thinking that these examples are all an inherent pa. t of the New Interpretation itself, which they are not. The point of the New Interpretation is that it proposes an operational and (pace the measurement problems mentioned above) unambiguous method of measuring the monetary expression of labor in any real economy, no matter how complex its production system in terms of times of turnover or joint production activities. Since the New Interpretation only proposes definitions of a restricted set of labor theory of value theoretical concepts (the monetary expression of labor and the value of labor-power) it can consistently be combined with a wide range of other definitions or hypotheses constituting particular theories of capitalist production (for example, theories about class struggle, induced technical change, international trade and imperialism, and the like.)

The New Interpretation has, I believe, had some effect in opening up Marxist economics to a more vigorous and fertile empirical/theoretical development in the last 15 years A promising beginning has been made in measuring the monetary expression of labor, the rate of exploitation, and other parameters of the circuit of capital in the work of Senchak (1983), Azari (1996), Matthews (1995), Alemi (1997) and Dumenil and Levy (1994)

In anticipation of later sections of the paper, let me point out that it is possible (as Fred Moseley particularly has emphasized) to extend the use of the monetary expression of labor defined by the New Interpretation to the translation of money measures of constant capital and stocks of invested capital into labor-time equivalents. We could, for example, take the money flow of purchases of intermediate inputs (which is netted out from firm accounts to create the national income accounts, but is preserved in census-based statistics like the U.S. Census of Manufactures) and divide it by the MEL to arrive at a number, denominated in labor time units, representing the labor time equivalent of the flow of constant capital. If we did this for an economy with a unit rate of turnover, then these labor time equivalents of constant capital would satisfy Marx's claimed quantitative equivalence between total price and value of output, and also between the average price and value rates of profit.[81]At the time, however, there seemed to be 110 plausible interpretation of the labor time equivalent of the constant capital or invested

[81] To see this in the circulating capital model of the last section, consider that the monetary expression of labor, μ, will in this context be defined as:$\mu = p(I ¡ A)x/lx$ If we now define the labor-time equivalents of constant capital, $c\mu = pAx/\mu$, variable capital, $v\mu = wlx/\mu$and surplus value $s\mu = (p(I– A) – wl)x/\mu$, then we have:

$$c\mu + v\mu + s\mu = (pA + p(I – A) – wl + wl)x/\mu = px/\mu$$

$$r\mu = s\mu/(c\mu + v\mu) = (p(I – A) – wl)x/(pA + wl)x = r:$$

Note that:

$$c\mu = pAx/\mu \neq \lambda Ax = c\lambda$$

capital (since these measures will in general be equal neither to the historical labor embodied in the means of production, nor to the labor that would be required to reproduce them with contemporary technology). In order to clarify the relation of the proposed New Interpretation to the "dual" system that had preceded it, Duménil and I both pointed out the quantitative incongruity between the embodied labor coefficient accounts rate of profit and the rate of profit at market prices arising from the difference between the labor embodied in the means of production and the labor-time equivalent of the money spent on the means of production using the monetary expression of labor. Fred Moseley has argued that this lacuna represents an inconsistency in the New Interpretation, which "transforms" variable capital, but does not "transform" constant capital in the same way. I personally see no objection to using the New Interpretation definition of the monetary expression of labor to derive labor-time equivalents of constant capital. In effect, Marxist empirical and theoretical studies based oil the circuit of capital do this by looking at the dynamics of the money values in the circuit.

8 Criticisms of the New Interpretation

The New Interpretation has been criticized on various grounds.

Anwar Shaikh and E. Ahmet Tonak criticize the relevance and originality of the New Interpretation in the following terms:

> As just defined, the value of money... is the living labor commanded in exchange by the net product. This means that the value of labor power ... is the living labor commanded by the money wage bill of productive workers, and that surplus value ... is simply the living labor commanded by the existing mass of profit. Marx argued that price and profits were monetary forms of value and surplus value. The new approach abandons this altogether by defining surplus value to be a form of profit! The whole relation between surplus value and profit is turned on its head. Moreover, tills approach does not even have the virtue of being new, since it is really nothing more than Adam Smith's second definition of labor value as living labor commanded by price. Ricardo and Marx decisively rejected this approach, with good reason. (1994, p. 179)

Shaikh and Tonak here reveal a misunderstanding of either the New Interpretation or of Smith's conception of value as labor commanded. Smith's definition identifies the amount of what he called "labor" and what Marx called 'labor-power" the price of the commodity could command on the market, in algebraic terms p/W where ;) is the money price of the commodity and w the money wage. Ricardo's and Marx '5 reasons for rejecting Smith's conception are good, and rest on the point that Smith's definition confuses the effects of technology and distribution on the value of commodities. Ricardo and Marx correct this by regarding value as being produced by the expenditure of labor in the production process, and therefore determined logically before the distribution of the value of net product between wages and profit. The New Interpretation is completely consistent with Ricardo and Marx's argument on this point, since the definition of the monetary expression of labor as the ratio of the value of the net product at market prices to the living labor expended in a period does not involve the level of money wages (and this is not Smith's conception)

One of the virtues of the New Interpretation is that it finally links the value of the net product at market prices to the expenditure of living labor and profit to unpaid labor time. It is true that the New Interpretation identifies the phenomenal forms of price to the categories of the labor theory of value, but it is hard to see why this turns the relation on its head. The New Interpretation locates the source of new value in the expenditure of living labor in production, not in market exchange, the relation Marx insists on.

As to the originality of the New Interpretation, there are surely suggestions along the line of the New Interpretation in the previous literature (starting with Marx, but not with Smith, in my opinion), including passages from Shane Mage (1963), Joan Robinson (1965), Bertram Schefold (1973), and perhaps others with whose work I am not familiar. The only claim I would make for Dumenil and myself in this regard is that we were the first (excepting perhaps Marx himself, if you accept the New Interpretation as a faithful representation of Marx's ideas) to pursue the idea and develop it into a complete and coherent interpretation of the labor theory of value.

Adherents of the dual-system interpretation of the labor theory of value tend to view the New Interpretation as a contentless "trick", which evades rather than confronting the problem of the relation between embodied labor coefficient accounts and market price accounts. The dual system framework poses the problem as proving mathematically the proportionality of profit and the wage bill measured in market prices to surplus and necessary labor the measured in embodied labor coefficients, and argues that the New Interpretation makes no contribution to this project. If one accepts the mathematical correctness of the dual-system demonstrations, as I do, then within that framework the question is completely settled: it is impossible in general to maintain the required proportionality, and neither the New Interpretation nor anything else is ever going to come to a different conclusion without committing a mathematical error. Accepting the mathematical validity of the analysis within the dual-system framework, However, does not require one to accept that this is the only, or the most relevant, way of posing the issue.

Recent unpublished work by Robert F. Brinkman (1997), for example, argues that the New Interpretation essentially complements and completes the dual-system interpretation. Brinkman points out that the original dual system analysis (rehearsed above) leaves the rate of profit calculated in terms of embodied labor coefficients, as well as the absolute level of the profit rate-equalizing money prices and wages, undetermined. He shows that taking into account the allocation of social labor time among sectors (or, what amounts to the same thing, the composition of net output) completes both systems, by determining the rate of profit in embodied labor coefficients and determining the prices of the commodities and the money wage up to a constant of proportionality which is, in fact, the monetary expression of labor is defined by the New Interpretation. Brinkman proposes to distinguish 'essential prices' (money prices divided by the monetary expression of labor) and 'labor values', that is, embodied labor labor coefficients. He argues that embodied labor coefficients are the appropriate accounting system to distinguish in general between necessary and surplus labor time, but that essential prices are the appropriate accounting system to distinguish between paid and unpaid labor time. Profit and the wage bill are always equal to 1)aid and unpaid labor time, but paid and unpaid labor time are equal to necessary and surplus labor time only under special assumptions that guarantee the proportionality of embodied labor coefficients to prices of production.

I agree with the dual-system advocates that the New Interpretation is a set of definitions rather than an empirical Hypothesis, but I disagree with their claim that as a result the New Interpretation has no theoretical or scientific content. This disagreement arises, perhaps, from different philosophies of science. In my view the labor theory of value under the New Interpretation plays a role in political economy analogous to the

role played by Newton's Laws in mechanics. The definition of the monetary expression of labor is analogous to the stipulation in Newtonian mechanics that force is equal to mass multiplied by acceleration. Taken by itself f = ma is just a definitional relation between three theoretical terms (just as the monetary expression of labor is just a definitional relation between the money magnitudes and living labor time), but in the context of a determinate mechanical system this definition decisively disciplines and directs scientific in contentful and fruitful ways. Thus while the New Interpretation does not itself propose any operational hypotheses about the evolution of the monetary expression of labor or the rate of exploitation, its definitional framework allows us to measure the evolution of the monetary expression of labor and the rate of exploitation in real capitalist economies and to link these magnitudes to other aspects of capital accumulation, such as the bias of technical change, or the class relations of particular societies. The dualsystem advocates, on the other hand, seem to be saying that only empirical hypotheses about the real world count as "theories", so that the labor theory of value has to be understood as a specific contingent hypothesis which Might or might not hold in specific situations (such as the hypothesis of a 'ugh correlation between market prices and embodied labor coefficients.)

Another way to make this point is that the New Interpretation definitions are ex post accounting identities, which must hold definitionally in all economies in all periods. The critics of the New Interpretation, seeking ex ante hypotheses with explanatory and predictive content, find the New Interpretation wanting in this regard. I am myself extremely interested in the development of *ex ante* hypotheses, and certainly support their investigation. The history of science, however, suggests that the discovery of successful *ex ante* Hypotheses is much aided by the establishment of appropriate heuristic *ex post* definitional frameworks, like Newton's mechanical laws.

Some scholars find the connection between money and labor time asserted by the New Interpretation to he arbitrary and unsupported. For example John Roemer (1990) criticizes the lack of economic motivation in the identification of social labor time with money.

This criticism seems to me to be closely connected with that of the dual-system advocates. As I have explained earlier in this paper, I think the main motivation for Marx's labor theory of value was the relation he perceived between it and the theory of historical materialism and class society. In Roemer '5 terms this motivation is not "economic", that is, directly connected to the analysis of commodity market relations. Roemer's failure to find much resonance in the New Interpretation may also be connected with his commitment to the Walrasian model of market equilibrium as a vehicle for the analysis of commodity relations. The Walrasian approach is in striking contrast to Marx's in its inability to integrate money, which is precisely the point on which the New Interpretation definitions rest.

Alfredo Saad-Filho (1996) in a well-informed and balanced appraisal of the New Interpretation (which he calls the "New Approach"), makes two critical points, one more persuasive than the other.

The less persuasive concerns the role of the net product in the analysis. Saad-Filho appreciates the issue of double-counting if the value of gross output at market prices rather than the value of net output at market prices is used to define the monetary expression of labor (p. 126). The full complexity of this problem is obscured by our thinking in terms of period models, in which the accounting period and the production period coincide. In real capitalist economies, we account in periods such as years that may span more than one turnover of some elements of constant capital in some production processes. The value of the gross product in market prices over a year, for example, may count some parts of constant capital more than twice. This point emphasizes the ambiguity of the concept of gross output in real capitalist economies as opposed to period models.

Saad-Filho sums this discussion up, however, by saying: "...the New Approach argues that only the value of net product should be the subject of the transformation...." As we have seen above, one can use the value of the net output at market prices to define the monetary expression of labor, and still use the resulting monetary expression of labor to "transform", that is, convert into abstract social labor equivalents, the flow of constant capital.

Saad-Filho persuades me more by his criticism of the New Interpretation for being excessively reductionist:

> This conception of price is methodologically questionable. Its main drawback is that this is simply a circulation-based view of price. It is correct as far as it goes, but it fails to give analytically priority to conceptually more fundamental processes such as the performance of labor in production, *vis-a-vis* more superficial phenomena such as the relations between supply and demand for each commodity or monopoly power. The internal structure of the New Approach leads it to address the appearance from the start..., but this apparent advantage exacts a heavy toll: it becomes very difficult to develop the theory further without making use of arbitrariness in the choice of phenomena to be explained, the judgement of their importance and their relation with other features of reality (1996, p 128)

I think this criticism has some merit. For example, there may be a real role for a concept of the value of labor-power independent of the *ex post* realized wage share In a fully developed Marxist theory. The approach of Brinkman outlined above, which retains a separate role for the concepts of necessary and surplus labor and paid and unpaid labor may suggest a way to address this issue.

9 The Temporal Single-System Approach

At the same time that Dumenil and I were publishing the New Interpretation (and in some cases in the same issues of the same journals), a nuinber of scholars, including Richard Wolff, Antonino Callari and Bruce Roberts (1982), and John Ernst (1982), began a critical re-examination of Marx's labor theory of value which has developed into an embryonic school (see for example, Alan Freeman and Guglielmo Carchedi, eds., 1996.)

Wolff, Callari and Roberts emphasize, as 1 have here, class and exploitation as the context of Marx's interest in the labor theory of value. They go on to propose that Marx used the word "value" in a different technical sense in his discussions in Volume III of Capita1 from Volume I. In Volume I, according to their reading, Marx used the word "value" to mean "abstract social labor directly and indirectly expended in producing the commodity", and therefore consistently with the mathematical definition of the vector A above. But in Volume III, Marx changed the meaning of the word "value" to mean the sum of the direct labor expended in producing the commodity with the abstract social labor-time equivalent of the means of production use(l up calculated by dividing the money price paid for the means of production by a monetary expression of labor. In a stationary economy with no technical change, they define these "values" as the vector V

in terms of the prices of production p (determined in the same manner as in the dual-system approach described above) by the relations:

$$p=(1+r)p(A+bl)$$

$$py= lx$$

$$v = pA +1$$

This amounts to the extension of the New Interpretation outlined above, in which the monetary expression of labor is taken to be titlity, as is evident from the second equation above. As I have already shown, if we regard the abstract social labor time equivalents of the constant capital as their money prices divided by the monetary expression of labor rather than the labor directly and indirectly embodied in them, as this approach proposes, then in addition to the proportionality of the money value of the net product to living labor expended, of surplus value to unpaid labor time, and of the wage bill to paid labor time, the price of the gross product will be equal to the value of the gross product and the price and value rates of profit will be equal. Wolff, Callari and Roberts argue exegetically that this interpretation seems to correspond to Marx's conception as expressed in Volume III, but offer no economic motivation or interpretation of the "value" coefficients, V. Fred Moseley, as I have remarked, has emphasized the desirability of making this extension of the New Interpretation.

Alan Freeman (1996a), Ted McGlone and Andrew Kliman (1996), and Alejandro Ramos-Martinez and Adolfo Rodriguez-Herrera (1996) call this a "single-system" interpretation of the labor theory of value, since in it the embodied labor coefficients A of the dual-system analysis disappear altogether. Ramos Martinez and Rodriguez-Herrera marshal considerable textual evidence supporting the claim that this interpretation is consistent with Marx's method of analyzing the relation of prices and values in Volume III of capital

I do not see any inconsistency between the New Interpretation and a single system interpretation of the labor theory of value, as long as the single-system interpretation consistently (either explicitly or implicitly as in Wolff, Callari and Roberts) defines the monetary expression of labor as the ratio of the money price of the net product to the living labor expended, as it must do in order to conserve value added, surplus value and variable capital in the analysis.

John Ernst's paper (1982) raises a further issue, the generalization of the labor theory of value to realistic situations where technology is changing over time. Ernst, working In a single-commodity model in which there can be no disproportionality of money prices and embodied labor coefficients, calculates two profit rates, a "visible" profit rate calculated as the ratio of surplus value to the sum of variable capital and constant capital reckoned in terms of the commodity as numeraire (or, in this case, equivalently in terms of money), and a "value" profit rate in which the constant capital is valued in terms of the labor historically expended to produce it. (In Ernst's paper lie examines a one-period circulating capital model so that only one older "vintage" of labor, last period's, is involved.) Since there is technical change, the labor embodied in each vintage of the commodity diverges from that contained in the constant capital used up to produce it, so that the "value" rate of profit is generally lower than the "visible" rate of profit.

Alan Freeman (1996b) argues vigorously for an interpretation of the labor theory of value general enough to embrace situations in which there is ongoing technical change, 50 that technology is not stationary, as it is assumed to be in many of the examples and models in the literature. Since ongoing technical change is a key feature of capitalist economic reality, it is hard to quarrel with this goal.

As I showed in (Foley, 1982a) and elaborated in (Foley, 1986b), the New Interpretation can provide such a framework. The key analytical simplification is once again the definition of the monetary expression of labor as the ratio of the value of the net product at market prices to the living labor expended in each period, an unambiguously defined magnitude. With this definition, it is possible to analyze capitalist economies undergoing any complex patter of technical change in the average money prices of commodities into a part representing changes in the productivity of labor.

If, on the other hand, we were to try to define the monetary expression of labor as the ratio of the price of the gross product to the total labor expended in producing the gross product in the context of ongoing technical change, we would confront the problem that the gross product contains means of production of various vintages, produced under different technical conditions, and embodying labor of different vintages and different productivities. This the labor embodied in the gross product is under these circumstances a vector of labor of different vintages. The definition of the monetary expression of labor as the ratio of a scalar (the contemporary value of the gross product at market prices) to a vector (the labor embodied in the gross product) is incoherent mathematically.

The attempts to develop a 'temporal single-system" interpretation of the labor theory of value in the Freeman-Carchedi volume fail to put forward a single, consistent definition of the monetary expression of labor, which is necessary to carry out their purpose. It appears to me that this definition should coincide with the New Interpretation definition, as in the Wollf, Callari and Roberts paper: otherwise the temporal single-system interpretation that results will not preserve the proportionality of wage bill and gross profit with paid and unpaid labor.

The language that surrounds this issue in these papers is somewhat obscure, so that I may be misunderstanding what is being said. But it appears to me that the temporal single-system program needs to distinguish clearly between the change in the value imputed to stocks of commodities from one period to the next and the value of the net product in the period. In a model economy with stationary technology, so that prices of production (and embodied labor coefficients) remain constant over time, the net product in a period equals the change in stocks plus consumption in use-value terms, and as a result the value of the net product (in either a market price, prices of production, or embodied labor coefficient accounting system) is equal to the change in the value of stocks plus the value of consumption. But in an economy undergoing technical change, market prices, prices of production, and embodied labor coefficients will all be changing from period to period. As a result, the value of the net product in any accounting system will not necessarily equal the change in the values of stocks plus the value of consumption. In fact, in national income accounting language, the value of the net product is equal to the change in the values of stocks plus consumption reduced by an "inventory valuation adjustment" representing the change in the value of inventories due to price changes through the period and a "capital consumption adjustment" representing the change in the value of fixed capital (Due to price changes through the period.

This problem arises, for example, in the examples that Andrew Kliman (1996) puts forward as "refutation" of the Okishio theorem. He makes the explicit assumption that

the monetary expression of labor is constant on the paths they examine (often in the form of a stipulation that $1 remains equivalent to 1 unit of labor on the paths studied). Then in order to calculate a path of prices (in order to derive the path of profit rates), Kliman equates the change in the value of stocks plus the value of consumption to the living labor expended in the period. But from the point of view of the New Interpretation definition, this equation does not hold the monetary expression of labor constant, since under the assumed conditions of changing technology and prices the value of the net product deviates from the sum of the value of consumption and the change in the value of stocks through the period. Kliman's equation attributes the changes in the value of inventories and fixed capital due to price change to the living labor expended, which seems counter to the Marxist interpretation of the labor theory of value. On the resulting price paths in the example, the monetary expression of labor in the New Interpretation sense is not constant, and the falling monetary rate of profit in the examples reflects this changing monetary expression of labor. When this aspect of the examples is corrected, the resulting price and profit rate paths do not contradict the Okishio theorem.

10 Conclusion

I would like to conclude by emphasizing what I see as a large degree of practical and operational agreement on the labor theory of value emerging despite the doctrinal disagreements we have reviewed. All the interpretations lead to the practical use of market price data in empirical studies based on the categories Marx's labor theory of value such as the rate of profit, the composition of capital, and the rate of exploitation, and hypotheses concerning these categories. Single system interpretations, including the New Interpretation (extended to use the monetary expression of labor to impute abstract labor time to constant capital), all link the labor-value categories directly to money and thus establish observed monetary accounts as the appropriate operational equivalents of the theoretical concepts.

It is interesting that the empirical work of Shaikh, Tonak, Ochoa and their students and collaborators and Cockshott and Cottrell showing a high degree of correlation between embodied labor coefficients and market prices, leads to a similar practice within the dual-system interpretation.[82] The point is that these results suggest that the choice of an embodied labor coefficients or a market price accounting system doesn't make much practical difference to estimates of Marxian categories like the rate of exploitation, or the ratio of unproductive to productive labor in real economies. Given the much wider availability of market price accounting data in financial and government sources, and the expense, difficulty and possible error involved in reconstructing embodied labor coefficients for many periods and economies from input/output tables, most empirical work, even by people who hew to the dual-system interpretation, will use market price data as a first approximation to an embodied labor-coefficient system of accounts. Thus single and dual-system theorists will find themselves pursuing similar and comparable empirical investigations.

I think this is a hopeful development, since my own interest is more in what Marx's interpretation of the labor theory of value can tell us heuristically about the structure and evolution of real capitalist economies than in what close reading and ingenious speculation can tell us about the consistency of Marx's unwritten thoughts. I also think this convergence of empirical method carries with it some hope for Marxist economic pedagogy. It should be possible for adherents of these different positions to teach their own and the alternative interpretations of Marx's labor theory of value honestly and clearly as alternative theoretical foundations for a unified empirical practice that can yield important insights into capitalist reality. The release of scholarly energy into the empirical investigation of the development of world capitalism need not wait on the resolution of every knotty interpretative and theoretical issue in the labor theory of value.

[82] I do not mean to attribute a dual-system interpretation of the labor theory of value to these scholars, only to point out an implication of the empirical results for dual-system practice.

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IF THEY'RE SO RICH, WHY AIN'T THEY SMART?
Another prelude to the critique of economic theory

Alan Freeman, University of Greenwich, March 7 1997*

Draft. Please check to see if a more up-to-date version exists before citing

Myself when young did eagerly frequent
Doctor and Saint, and heard great argument
About it and about, but evermore
Came out the same door as in I went
– the Rubáiyát of Omar Khayyam

A watershed in the discussion

After eighty years, recognition is dawning that values can be transformed into prices consistently with all Marx's contested assertions. For twenty years the procedure, though freely available,[83] has been ignored, suppressed, or both. One indicator of four years' progress, and of the debt we owe to those who have started to study this procedure seriously, is I can at last say this here without spending twenty pages proving it. One indicator of how far there is to go is that before discussing the next step, as in a normal discourse, I must spend the same twenty pages saying why it matters. I have therefore produced this, separate, paper, on the meaning of the discussion on the interpretation of Marx.

What's it all about, Tony?

The debate on transformation and the rate of profit is often presented, as in Brewer (1995), as a sectarian squabble over the legacy of an obscure 19th century 'minor post-Ricardian'. I will begin with a novel idea: its importance is not what it tells us about Marx, but what it says about economics.

Steedman (1977) cogently explained that for 80 years the best brains of economics thought about the argument against Marx and failed to find the logical flaw in it.

* I have tried to acknowledge specific contributions in the text. Haste may have prevented doing this adequately. Among many omitted that I would like to thank are the many contributors on the OPE discussion list, and all the participants in present and past IWGVT conference who have made this discussion possible.

[83] The New Interpretation dates to the 70s and, we shall argue, opens a path to the Single-System interpretation which any free-thinking person can tread. In the early 80s Husson published in French and Savran independently described but could not publish a Temporal Single-System (TSS) interpretation. Wolff, Callari and Roberts in 1982 published the earliest Simultaneous Single-System (SSS) interpretation, and Guglielmo Carchedi published elements of a temporal version; Robert Langston arrived at a similar solution as is clear from his chapter in *Marx, Ricardo and Sraffa*. Ernst demonstrated the dependence of orthodox refutations of Marx's tendency of the rate of profit to fall (TRPF) on simultaneity in the early 1980s. Andrews also established the centrality of the equilibrium assumption in Okishio's result in 1984 and Naples' non-equilibrium critique of Bortkiewicz was published in 1985. By 1986 – more than ten years ago – a temporal proof of the internal consistency of Marx's transformation had been presented by Kliman and McGlone. Moreover any systematic extension of the iterative procedures rediscovered by Shaikh and Morishima (and already presented in the 1930s by Shibata) leads, as soon as historical time replaces logical time in a coherent way, to a confirmation of Marx's transformation as evidenced in Giussani (1991). Kliman (1988) applied a fully temporal approach to demonstrate the consistency of Marx's formulation of the TRPF. Moseley to my knowledge began working in a framework close to SSS in the early 1990s. In 1991 I presented a circuit-of-capital simulation of reproduction with technical change confirming Marx's transformation and yielding a cycle based on turnover time, and a general mathematical formulation in 1994 which was published in 1995. Maldonado-Filho circulated a temporal defence of Marx's transformation procedure and profit rate measure in 1986 and a revised version to the ASSA in 1995, which was apparently rejected by RRPE.

Evidently the final outcome of this thinking is that they got the wrong answer. Does this 'prove Marx right'? No; but it does tell us something else: all hitherto existing economics got it wrong.

Now, I was brought up a scientist, for good or ill. The only positive lesson I retain from positivism – and from eight years of math and formal logic – is that when you get something wrong, you ask why. Economics claims to be a science. It spent eighty years and a lot of money proving Marx wrong; the answer was staring them in the face, and they missed it. How?

As Marx noted, in competition everything appears in reverse, and so it is with economics. To put the question the right way up, I want to ask why economics felt it so important to 'prove' a minor Post-Ricardian wrong in the first place. Was it something to do with Marx, or something to do with economics? Let us first assess Marx's place in the history of economic thought dispassionately. Foley (1995) refers to the profession's 'chronic difficulty in coming to terms with Marx'. Can we explain this? I don't think it is hard to understand: Marx was its most ferocious critic.

Marx was the most radical and intransigent antagonist, not just of what the economists said, but of their profession as such. He did not just say they were wrong; he said they could never get it right. He, alone among economists, said a science of economics was impossible in a market economy. Because money is the alienated product of social relations, his radical programme for overturning market relations included the thesis that economists would never as a body see them as they really were.[84]

Whether false, true or socially relative, I think this has all proved too much to stomach for the profession of economics, which goes to extraordinary lengths to dismiss these ideas and their author. Now, however, it is for *other* reasons – which I shall examine – in crisis. It has called the tune for 80 years and the piper has come for the debt. That, I think, is the reason for the present debate.

Man bites dogmatist

Next let's ask what led to the current re-evaluation. In welcoming the generosity of the few who take the new work seriously, I must say that I am in all honesty underconvinced that the change was the product of self-correcting tendencies in the profession. Things began to move began when the worm turned; when isolated, ignored, rejected, and outraged individuals decided to work together to promote the alternatives which orthodoxy, with all its resources, refused to contemplate. We have had four years of IWGVT conferences, of patient organising, corresponding, listening, discussing and lobbying. Our manner of speaking, our insistence on being heard, our refusal to take no for an answer, did not always constitute civilised salon conduct. We admit it, we are the heaven's devils[85] of the single-system set, the punks of political economy. But if we hadn't done it, would the present rethink be happening? I think not. It took an *exogenous force* to confront our profession with conclusions it ignored for eighty years.

To summarise: first, the best brains of economics studied their arch-critic for 80 years and got it wrong. Second, the re-examination came from outside. Why? The moment I met this question, I concluded that not Marx, but economics, was in the dock.

And this leads to a third question: if economics got this one wrong, what else? Would you buy a used car from it? Is there *anything* we can trust in the concepts, logic, procedures and quantitative measures we inherit from it – including our own unreconstructed prejudices? This paper reconsiders Marx's prime project – the *critique of political economy* – and proposes to relaunch it. We should re-examine all these concepts and methods, enquire into their origin, and determine the effect when they are applied as policy. That is where I think the debate needs to go and the basis of this contribution.

Whose line is it anyway?

That leads us to question more closely the origin of those interpretations of Marx in which the errors appear. Bortkiewicz – more honest than many successors – introduced his proposal 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)

Bortkiewicz's reading, the standard, is consciously and explicitly Walrasian. It sets out to remove the acknowledged principle of temporal succession, which runs like a red thread through the whole of Marx's writings, and replace it with an alternative, neoclassical principle – simultaneous causation.

In our view, this fact has not been honestly faced. The 'correction' which fooled our best brains for eighty years alters not only Marx's calculation but his *method*. It absorbs the most trenchant critic of Say's Law that economics has known into the framework of general equilibrium – the only framework that can support the subjective determination of value, on which all neoclassical thinking rests. This is the economic equivalent of reading Cromwell as a confused monarchist. You can just about square it with the record, but it hardly explains the English Revolution.

The principle of simultaneous causation appears nowhere in Marx and moreover this is beyond dispute; a jesuitic search may find tenuous evidence for 'equilibrium', but nowhere will you find simultaneous causation. It is an alien imposition, a reinterpretation of Marx according to neoclassical principles. Moreover we know, from the history of our subject, the origin of Marshall's insistence on this principle.

[84] "Bastiat does not represent the last stage [of vulgar political economy]. He is still marked by a lack of erudition and a quite superficial acquaintance with the branch of learning which he prettifies in the interests of the ruling class. His apologetics are still written with enthusiasm and constitute his real work, for he borrows the economic content from others just as it suits his purpose. The last form is the *academic* form, which proceeds "historically" and, with wise moderation, collects the "best" from all sources, and in doing this contradictions do not matter; on the contrary, what matters is comprehensiveness. All systems are thus made insipid, their edge is taken off and they are peacefully gathered together in a miscellany. The heat of apologetics is moderated here by erudition, which looks down benignly on the exaggerations of economic thinkers, and merely allows them to float as oddities in its mediocre pap. Since such works only appear when political economy has readched the end of its scope as a science, they are at the same time the *graveyard* of this science." Marx, *Theories of Surplus Value* Volume III:502

[85] Like Hell's Angels, but worse. Angels are *nice*.

Admirably charted by Dobb,[86] it arises from Marshall's criticism of Jevon's 'Catena of causation'. This implied, because of temporal succession, that cost of production determined marginal utility. Simultaneous causation had an ideological purpose: to rescue the subjective determination of value from an insoluble internal contradiction. Yet for eighty years, almost no-one has questioned the fact that the standard which passes for 'Marxism' is founded on this ideological principle, or asked if the source of the error might be this ideological principle, rather than the work of Marx.

Concerning the right to fly on broomsticks

This gives the current debate an inverted form. Orthodoxy responds to its critics like mediaeval religion which fashioned witches – daemonic representations of its opponents – charged them with its own worst secret longings, guilts and fears and so terrorised the people out of heresy. The heretics then had to defend what they never took part in. This has a parallel in the stance of latter-day Marxists who in effect speak up for the right to fly broomsticks. We have been obliged to point out that no-one actually flies broomsticks, which makes the debate seem like an argument between witches and their critics. But its real content is resistance to persecution and the religious order which conducts it, the Worshipful Company of the Defenders of Money.

To recap: the reading of Marx which is without doubt inconsistent, redundant, and wrong, was a re-interpretation of Marx from the standpoint of the founder of neoclassical economics, Léon Walras.[87] Let's call things by their names. What has been refuted is the neoclassical reading of Marx.

Since I expect this to cause personal distress I'd like to be precise about it. First off, a definition. By *neoclassical* I mean the specific combination of simultaneous causation with a use-value standard of value. The standard reading of Marx is generally presented as the negation of subjective value determination. I shall prove in this paper that this is not the case, and that simultaneous causation demands a use-value-based standard, the standard which the subjectivist enterprise actually yields, and which the normal reading of Marx unconsciously accepts and consciously defends.

Second, I do not claim a neoclassical argument is necessarily wrong. Some of my best friends are neoclassicals. Every argument stands on what it is, not where it comes from. Indeed, I have better discussions with neoclassical friends in which we each simply say what we think, discuss the evidence, determine what where we differ, and decide on joint action. The difficulties arise entirely when it is claimed that an argument originates from somewhere other than whence it really came.

Second it does not brand those who use such arguments as neoclassicals. An argument is an argument and it can be used by anyone.

Most important, it does not rule the neoclassical reading out of court as a possible interpretation of Marx – any more than our own. On this there seems to be an extraordinary level of misunderstanding. Several readings of Marx exist; a main purpose of our group was to construct an space to assess, on factual evidence, which of them makes the most sense, ending the repressive culture which rules the embarrassing ones out of order before the discussion begins. I think our conferences have been something of a breakthrough in building a genuine dialogue between these several different readings.

It is no part of this project to establish a new canonical reading or 'direct line' to Marx. On the contrary, everyone I know who shares my general way of thinking wishes to ensure that *no-one* should ever again claim special authority from Marx. But this *also* means that never again should a scholarly work refer to '***the***' Marxist Theory of Value without saying *whose* Marxist Theory of Value is under discussion. The mere act of writing down these words in this way *already* asserts the dogmatic claim that there is in existence such a canonical theory. That is the entire source of the heat in this discussion and it is a gross and confusing distortion to read resistance to it as an attempt to establish a new dogma.

We are for the end of all dogma. We wish to end the existing doctrinal, dogmatic practice of claiming authority to speak for Marx. *But the only current claimant of a 'line to Marx' is the existing, neoclassical, reading.* This has a place – alongside and equal to all others. Its claim to be the only such, to confer the accolade of scholarship on dialogues that make no reference to any other, and on this basis pass solemn judgement on Marx, is a scandalous violation of the rules of scholarship and should cease.

The issue is more serious than the rights of the aggrieved: every time someone refers to 'the' Marxist Theory of Value, orthodoxy escapes its part in the authorship of this theory. If, after 80 years, orthodoxy has been proved wrong, then it is too convenient by far to say that the subject of its errors was not a debate with its critics, but between its critics. We repeat, neoclassical economics is in the dock; it is not acceptable to sneak it back into the jury because the judge is out to lunch.

In conclusion the debate about the interpretation of Marx is not a discussion within Marxism. It is a debate *between economics as a whole and Marx's critique of it*. This is not a squabble among the Readers of the Lost Ark but a debate on the future of economics. To conceive it as an exercise in doctrinal wrangling is a debasement of the issues at stake.

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[86] Dobb (1973:185) wrote: "In the second edition [of Jevon's *Theory of Political Economy* - AF] he formulated the curious restatement of his theory in abbreviated form upon which Marshall was to comment so adversely:

> Cost of production determines supply
>
> Supply determines final degree of utility
>
> Final degree of utility determines value

On this Marshall, who had reviewed Jevon's book rather ungenerously (*Keynes says 'grudgingly') in the *Academy* for April 1972, made this comment (*Principles* Appendix I, p818) 'Now if this series of causation really existed, there could be no great harm in omitting the intermediate stages and saying that the cost of production determines value. For if A is the cause of B, which is the cause of C, which is the cause of D, then A is the cause of D. But in fact there is no such series.' After propounding his own view of 'mutual determination' of 'supply price, demand price and amount produced' (which he regards as 'the greatest objection of all' to Jevon's presentation), he ends by inverting the order of Jevon's statement ('a catena rather less untrue than his can be made'):

> Utility determines the amount that has to be supplied
>
> The amount that has to be supplied determines cost of production
>
> Cost of production determines value

because it determines the supply price which is required to make the producers keep to their work'"

[87] John E. King (1996) casts doubt on Bortkiewicz's affiliation to Walras. Jaffé (1965 Vol II:230) records that Bortkiewicz, a lifelong admirer of Walras, corresponded with him from the age of nineteen. His first letter to Walras begins: "Your writings, sir, have awakened in me a lively interest in the application of mathematics to political economy, and has pointed out to me the road to travel in my researches into the methodology of economic science."

The Critique of what by whom?

> Wenn ein Preusser hinfällt, steht er nicht auf, sondern sieht sich um, wer ihm schadensersatzpflichtig machen kann
>
> When a Prussian makes a mistake, he does not stand up, but looks round for someone to blame
>
> – Kurt Tucholsky, *Schnipseln(1931)*

The heretic, the dogmatist, and the seeker after truth: what's the difference?

Brewer (1995) wryly observes that:

> Marxists have a ready explanation for the neglect of Marx's work by 'bourgeois economics'. Consciously or unconsciously, it is said, economists identify themselves with the existing system. They are afraid of the revolutionary implications of Marx's ideas and therefore choose to ignore them

This sets the scene for a universal theme; the Marxists evidently cannot be proved wrong. They have a dogmatic, self-justificatory defence: they are rejected because they are hated. No doubt distastefully anti-social stances have been observed among Marxists but the argument points both ways. In a clash of doctrines it cannot be assumed that the dogged are guilty of dogma; they might be guilty of heresy, or, heaven forbid, truth. The test of dogma is not persistence. This would be ridiculous – how does it distinguish dogma from truth? The test of dogma is reaction to error.

The new approaches arise because a tiny group of thinkers *accepted* Steedman's criticisms, took the contradictions seriously, chose not to wish or explain them away and launched instead the rather lonely programme of examining their own preconceptions to see where the errors came from. They overturned all common prejudices about Marx and constructed a reading which, they then found, not only corrected the supposed errors but led onwards to a deep and devastating criticism of neoclassical theory, demonstrating the neoclassical origin of the standard interpretation of Marx and re-establishing the rigorous foundation of all Marx's discarded criticisms of political economy. This is a scientific, not a dogmatic reaction.

Now it's the other side's turn.

Source and sorcery: an update on the Samuelson eraser

It is very convenient that the version of Marx's critique which Brewer chooses to study is that constructed by neoclassical economists. For, this version preserves intact all the mistakes of which Marx is accused. Convenient, also, that the only possible logical explanation which this leaves for the economists' rejection of Marx – the Marx which they themselves constructed – is that Marx was wrong. How inconvenient it would be, if Brewer's defence of neoclassical economics was measured against interpretations of Marx in which these errors do not appear. How fortunate that these interpretations do not figure in the debate. He writes as follows:

> The issues involved in the transformation problem are now well-known and can be summarised briefly. Marx used a two-stage procedure to get from values to "prices of production" (equilibrium prices).

As authority he cites Howard and King and Desai and for dissenting views Morishima, Roemer and Steedman. The 'dissenting views' of at least sixteen unmentioned researchers are that:

(a) Marx did not use a two-stage theory but a single-stage transformation

of these, all but four maintain that:

(b) Marx did not produce an equilibrium but a successivist [sequential, temporal] solution.

Together, (a) and (b) provide a fully coherent logical confirmation of all Marx's disputed assertions. This is the true 'eraser' technique: to prove Marx has no impact on economic thought, erase all the economists who think about him. Brewer's is a self-contained and self-referential defence of neoclassical economics, by neoclassical economics, for neoclassical economics. The same line of argument would have confirmed the sun goes round the earth in 1600, since the priests had rejected the contrary for the eighteen hundred years since Aristarchus of Samos first asserted it.[88]

Your call, guys

A nondogmatic reaction to the discovery of an error in the standard interpretation would be openly to acknowledge the errors in this interpretation, and enquire as to all the sources of that error. Is this what Marx's critics do? No, they act as if the error did not exist.

As Brewer points out, judgement in the face of intransigence requires an independent standard of assessment. Unfortunately, he does not actually provide one. Instead he argues – again a common theme – that this standard must exist because (in essence) a hundred thousand economists can't be wrong, a contestable assertion. His argument is as follows: the economists have surely rejected Marx because Marx is wrong, and the proof is that Marx is not rejected elsewhere.

> This kind of explanation may have some force, but it cannot account for the glaring contrast between economics and other disciplines. In history, political science, sociology and so on, while Marxist theories have not generally won the day, they have been taken very seriously and have had a major influence on the development of ideas. If a fear of revolution is the main reason Marx has been ignored by economists, he would have been ignored by practitioners of other disciplines as well

This leaves out a more venal possibility: perhaps they reject Marx more vigorously than anyone else because they make more mistakes than anyone else. With embarrassing failures to account for and material interests at stake, they might well have trouble facing a quarrelsome critic. Might it not just be easier to eject him from the performance?

What does economics offer?

> We can't solve problems by using the same kind of thinking we used when we created them
>
> – Albert Einstein

In economics, everything appears in a mirror

In the apparently obscure debate about 'which interpretation corresponds to what Marx says' there lurks a different and more substantive issue than doctrinal fidelity. Brewer's case – like all refutations of Marx – rests on making neoclassical economics not just the judge and jury of Marx, but the defence and prosecution. As we shall show, a neoclassical concept of Marx lies at the heart of the very errors which the neoclassicals have found in Marx.

[88] To which Cleanthes responded Aristarchus should be tried for impiety 'moving the Hearth of the Universe, because he tried to save the phenomena by the assumption that the heaven is at rest, but that the earth revolves in an oblique orbit, while also rotating about its own axis' (Sambursky 1987:91)

But is it only Marx who offers a critique of equilibrium? And is it only Marx that the profession rejects? Brewer's account would be rational if Marx, and only Marx, was excluded by mainstream orthodoxy. But this is not the case.[89] Economics is the least tolerant of professions. Its heterodox critics, above all non-equilibrium critics, receive little or no recognition. Why?

Neoclassical dogma, meet reality. Reality, meet neoclassical dogma

Happily, science suggests a better criterion for judging theories than Pharisaic scrutiny: comparison with what actually happens. Paul Ormerod, by no means a radical, is an Oxford and Cambridge Don, a successful businessman and a former director of the Henley Institute of Forecasting and of the *Economist*'s Assessment Unit. "Good economists know, from work carried out within their discipline, that the foundations of their subject are virtually non-existent," he explains in *The Death of Economics* (1994),

> Economists from the International Monetary Fund and the World Bank preach salvation through the market to the Third World. Yet economic forecasts are the subject of open derision. Throughout the Western world, their accuracy is appalling. Within the past twelve months alone, as this book is being written, forecasters have failed to predict the Japanese recession, the strength of the American recovery, the depth of the collapse in the German economy, and the turmoil in the European ERM.

We can add some more. They failed to predict Black Wednesday, wrongly claimed a global free market would lead to world prosperity, and through the IMF and World Bank imposed advice which has led to economic catastrophe, famine, war, havoc and genocide. On the basis of current orthodoxy, unemployment in Europe hovers at forty million and fascist parties are either in government or second-line opposition in both Italy and France. IMF policies, based on impeccable economic advice, led to the collapse of the price of Rwanda's output, in return for which Western powers placed $200m in hard currency in the Rwanda's central banks which was promptly used for the massacre of a million people.

This is not a salon discussion. This is not a 'personal' issue. If we occasionally get angry, no-one should think we do so without cause. These mistakes were neither necessary, nor did everyone make them. Anyone with an open mind can get it right. All they have to do is rid themselves of their profession's prejudices. Thus Ken Livingstone MP, writing to universal ridicule from the educated:

> it is clear that the government will be unable to sustain the DM2.95 parity set for ERM membership. Devaluation, a market forced attempt to make the economy more competitive and increase its capacity to export, is inevitable. The only question is how long before the devaluation and whether it will occur before or after the general election (Socialist Economic Bulletin Research Paper #1)

Within a year the ERM went into a tailspin and Britain came spiralling ignominiously out of it. Nor are we discussing measurement errors or tactical mishaps. The failures of the profession are deeply rooted in the theoretical preconceptions of textbook economics. Consider the textbook theorem on trade, Samuelson's factor-price equalisation theorem (Lindert 1986:74)

> free trade will equalise not only commodity prices but also factor prices so that all labourers will earn the same wage rate and all units of land will earn the same rental return in both countries regardless of the factor supplies or the demand patterns in the two countries

Of course, we all know that even in the fifties the empirical falsity of this thesis was already widely known to economists. As Lindert writes (op cit)

> Even the most casual glance at the real world shows that the predictions of the factor-price equalization theorem are not borne out. One of the most dramatic facts of economic development is that the same factor of production, for example, the same labor skill, does not earn the same pay in all countries.

No doubt this explains the following:

> In the 1980s, the political ascendancy of conservative governments in the United States, Britain and West Germany brought with it a neoclassical counterrevolution in economic theory and policy. Neoclassicists obtained controlling votes on the boards of the world's two most powerful international agencies – the World Bank and the International Monetary Fund…The neoconservatives argue that by permitting free markets to flourish, privatizing state-owned enterprises, promoting free trade and eliminating the plethora of government regulations and price distortions in factor, product and financial markets, both economic efficiency and economic growth will be stimulated. (Todaro1994:86)

By 1989 Peter Rogers and Christopher Huhne in the Guardian were moved to comment:

> Six years ago, when we first published a map of the world's debt league, the consensus amont bankers was that the problem would take until the end of the 1980s to solve.
>
> They could not have been more wrong. As the revised map we publish today demonstrates, the problem has become worse, not better, as the end of the decade approaches. A depressing consensus is emerging that it will take at least another 10 years to resolve. Debt has risen even faster than the growth of exports needed to pay it, so that it has become harder to pay the interest. Living standards have fallen, in some cases drastically, and poverty has intensified. The prospect that debts will be serviced is so little that banks are willing to accept less than 50 cents in the dollar on average to cancel or exchange loans made in the heady days of the lending free-for-all…Worse still, there has been a huge financial transfer from the poor to the rich industrial nations, of $43bn in 1988 and over $140 bn in the last five years.

There is no let-up. At the end of the dreadful Victorian epoch in which Doctor Marx's followers allegedly still live, the richest country in the world was 23 times better off than the poorest. By 1990, according to the UN, the factor was 142. In 1980, the beginning of the globalisation offensive, the average GDP of the USA was 40 times that of India. Seventeen years later, the factor is 80.

What kind of research do we need?

Let us now suppose that the working economists involved in these failures worked for an ordinary company, and let us suppose that on the basis of their past record, they applied to the company for a grant for a further research programme.

I think if the company directors valued their lives, never mind their assets, they would reach the following conclusion: all the research leaders who made these recommendations should promptly be replaced by their most vociferous critics, if any can be found. These critics should be strictly forbidden to issue any further policy recommendations pending completion of a single, unified research programme calling forth the greatest talent the company has to offer, namely, to find out how these maniacs got everything so wrong for so long, and got paid for it into the bargain. They would tell their economists to put their money into the study of *their own* ideas and errors and not come back until they had explained them. They would invest, in short, in the critique of political economy.

[89] See for example the exhaustive survey of the UK Research Assessment Exercise by Harley and Lee (1995). Note also the prodigious growth of ICARE, the International Confederation for the Reform of Economics.

What does Marx offer?

The moving finger writes, and having writ,
Moves on. Nor all your piety, nor wit,
Shall lure it back to cancel half a line,
Nor all your tears wash out a word of it
– The Rubáiyát of Omar Khayyam

The real and the ideal in the world of equilibrium

Happily for relations with colleagues, my immediate research proposal is more limited: it is simply to examine more closely, and with a teensy bit more humility, the work of the man who first suggested that results like those above were likely. It would start from the following: what has the profession, in order to exclude Marx's insights, excluded from its thinking?

There has been some discussion of scorecards. But so far, the scorecard has been applied only to Marx. Let's put *economics* to the test. Let us take a calm look at some of the principal propositions with which – it is not disputed – Marx is associated. Since, as Brewer kindly points out, Marx has no influence on the profession, we trust we can asssert without challenge that it rejects these propositions. Let us see what it chooses to ignore. This includes:

- Marx's critique of Say's Law, the 'metaphysical equilibrium of buyers and sellers' or the form in which the dogma of equilibrium was in his day expressed;
- Marx's 'dogmatic' assertion that the free market produces long-term unemployment;
- Marx's critique of both banking orthodoxy and banking reform;
- Marx's critique of the quantity theory;
- Marx's denial of the long-term viability of financial regulation as a substitute for a direct overturn of the market in investment goods;
- Marx's distinction between real and fictitious capital, the basis of his assertion that financial crashes and credit crunches were a necessary product of the market;
- Marx's 'logically false' proof that accumulation lowers the profit rate by increasing the value of capital stock leading to periodic accumulation slowdowns;
- Marx's insistence on the endogenous basis for the business cycle – let's not forget that for thirty years the profession stoutly maintained this cycle had vanished.
- Marx's proof that capitalism unavoidably creates a permanent class of workers and a permanent class of capitalists;
- the Marx-based critique of neoclassical trade theory and its proof that growing inequality between nations is a necessary consequence of globalisation;

This strikes me as a pretty useful wish-list for anyone setting out to find out what's wrong with economics. The question 'what's it all about' can be rephrased like this: Marx offers several clear, empirically-verifiable criticisms of the economic theories of his day; the same dogmatic and doctrinal assertions that led to the catastrophes of his day are endlessly re-incorporated into new theory; these same assertions form the basis of most current policy; Marx's forecasts of the results remain, a hundred and thirty years later, unbelievably accurate.

Is not possible that the odd economist might benefit from a dispassionate attempt to discover how he reached these conclusions? Is it not relevant to reconstruct the reasoning, the method of enquiry, and the conceptual framework which allowed him to draw these conclusions?

Marx not wrong[90]: why it matters

I hold a simplistic view of the purpose of debate: it is to criticise one's own thinking by examining the opposing view. The most fruitful way to debate is to *understand* what you oppose, which I take to be the scientific method. This is not the reaction of orthodox economics, which approaches its critics, frankly, like a tomb-robber turned trophy-hunter. It seeks only what it can drag back to domesticity and what it cannot subdue it kills, stuffs and mounts to boast of over brandy, savouring the quiet *frisson* of knowing that were it alone with the live beast in the jungle it would not last an hour.

The prolonged enterprise of showing Marx not merely wrong but 'inconsistent' has a very specific function which is insufficiently recognised.[91] It is not a 'normal' discussion tactic but has a profoundly anti-democratic content. Its function in the debate has been to *exclude* consideration of Marx's arguments or evidence.

Marx must be 'shown' inconsistent because economics cannot defend its *results* against his critique, and therefore demands an excuse for refusing to confront his *concepts*. In fact the best way to benefit from any critique is to understand it in its own terms; this is exactly what economics cannot afford to do, for it would then be plain to the whole world that the entire edifice stands on nothing. It is therefore a serious misunderstanding to construe the interpretation of Marx as doctrinal or hermeneutic and the profession only sees it in this way because its own tradition is doctrinal through and through. At the core of this tradition lies a blank refusal to discuss *concepts*, substituting models, nostrums, and alchemical equations from which it can derive the missing concepts, for which the sole criterion of acceptability is to make the equations work. Yet it never assesses the *object* of these frankly superstitious models, nostrums and equations. It never asks what the variables *mean*.[92] Marx does ask what they mean: what better way – indeed, what *other* way – to duck his questions, than to 'prove' his equations don't work?

Economics is literally the science that does not know what it is talking about. Indeed it is is boastfully proud of this. Though this seems a difficult idea for the profession it is central to this paper. I will illustrate with the two concepts most central to the whole edifice: the labour force and the price level.

[90] A feature of economics' terminal logical confusion is that unlike logicians, lawyers and the unlobotomised public, it cannot distinguish the phrase 'not wrong' from the word 'right'. No-one claims the current debate proves Marx *right*. Pleading not guilty is not the same as claiming the accused is in fact God. At stake in the present debate is a very specific charge, repeatedly hurled at Marx for 80 years, that his equations don't add up and value is inessential to his theory. They do, and it isn't. The charge has been thrown out. We are suing for malicious prosecution, not beatification.

[91] I would like to acknowledge Andrew Kliman's absolutely justified insistence on this point.

[92] In this I fully agree with the criticism mounted by writers such as Steve Fleetwood.

Concepts versus models in economic debate

> The critique of bourgeois ideology begins with the critique of common sense
>
> – Antonio Gramsci

What is unemployment?

On 20th August Clinton decreed a two-stage increase in the minimum wage, the first since 1989. Angus Deaton, William Church Osborn Professor of Public Affairs, Professor of Economics and International Affairs at Princeton University and generally considered a serious honcho on both sides of the pool, reported in October to the Royal Economic Society (of which he is a former president):

> In Congress, the measure attracted bi-partisan support, as had previous minimum wage hikes. In the Senate, the bill was so popular that Republican Majority Leader, Trent Lott, held the measure back as a reward for his colleagues if they completed other measures before the summer recess. But the enthusiasm of the voters, 80 per cent of whom favoured an increase … is not echoed by the majority of American economists. Although many support an increase in the minimum, 90 per cent believe that raising the minimum wage will lead to higher unemployment.

The Clinton administration's support for the measure leant on detailed empirical evidence compiled by David Card and by Paul Krueger, chief advisor to Senator Edward Kennedy. Their *Myth and Measurement* (1995), a detailed study of actual changes in the minumum wage, suggests these had little or no effect on the employment of low wage workers. Deaton describes their results as

> convincing and straightforward, so much so that their import is clear to policy makers and to the media.

The US profession seemed strangely unmoved. 'We have been disquieted,' remarks Deaton,

> by the level of public and private vituperation that has greeted [this] evidence. The reception accorded to the Princeton economists by their colleagues in other institutions is what might be expected by the friends and defenders of child-molesters, and the public outcry has been no less extreme.

Paul Craig Roberts used his regular *Business Week* column to demand the American Economic Association withdraw its most prestigious award – the John Bates Clark medal – from Card,

> an economist who does not believe in the law of demand, the cornerstone of economic science

A *belief* is the cornerstone of a *science*? Card's sin is not what he sees, says or does but what he thinks. Is this some accidental polemical excess? We don't think so. It is the normal method of everyday economics and a natural consequence of its conceptual framework.

To what 'demand' does Roberts' law apply? Like all economists he does not mean actual demand or actual supply, observed in the real economy. He means theoretical demand and theoretical supply, expressed in curves which – as Frisch stated when he formulated the identification problem – can never actually be observed. His 'law' refers to a hypothetical equilibrium that never happens. What we *observe* is 'imperfect competition', an 'adjustment', 'imperfect information', a 'shock' or 'exogenous' – any excuse to avoid calling it what it really is. The language speaks for itself. Who ever saw perfect competition? What information is perfect outside Nirvana? What defines Black Wednesday as 'exogenous'? Adjustment towards what? The very words betray *concepts defined by an ideal*.

In short, the standards by which economics judges that 80% of the American people are wrong (we wonder what the Brewer criterion implies for this fact) is that what they actually observe in real life does not correspond to the purely ideal situation which is the stock-in-trade of the profession.

Roberts' onslaught cannot be countered with another, alternative ideal model. This leads to a war of models; a theological dispute between two world systems neither of which connects up with the world we live in. The origin of the doctrinal method in economics is the method of debating around purely ideal models in which the variables are defined by the models instead of, as in all genuine sciences, the other way around. The response is to question the *meaning of the terms*. The refutation of Roberts is that his definition of unemployment is obscurantist, ideological and corresponds to nothing that actually happens to the good people of the USA.

Questioning the meaning of terms is not a substitute for empirical work; it is what empirical work ought to consist of. The first requirement of study is clearly to define the object being studied. The first requirement of measurement is to state what is being measured, which is not defined by the measurement. In short, a procedure does not define a concept.

Genuine empirical work prescribes a clearly defined relation between procedures and observables, sensuous aspects of reality which ordinary people can verify for themselves. This is what the model-builders and the datacrushers alike fail to do. Econometrics has become contentless world-building, Sim-City for the big boys. The issue is that when the people of the USA say they're unemployed, Paul Craig Roberts says they ain't. That not only gets the point across a damn sight quicker than fifty slick models, it is the correct scientific criticism to make.

Where do the unemployed come from? Early Keynesian debates

The definition of unemployment is a very old issue. In normal usage, it means what it says: there are people who are fit to work but don't. Originally no clear distinction was made of 'voluntary' from 'involuntary' unemployment. According to Kahn (1976) Pigou introduced this in 1914 to distinguish between two kinds of inactivity: leisure, which was voluntary, and unemployment, which was not. 'Involuntary' unemployment thus meant 'unemployment'. However Pigou defined unemployment using a distinctively subjective notion: it consisted of people who *desired* to work, rather than those *capable* of work. This is the basis of the textbook definition of the labour force as people 'seeking work'.

As the boundaries of the welfare state fall back, layer after layer is redefined out of the labour force by successively more humiliating tests of 'willingness' to work.[93] One only has to compare this with the criterion for the draft; if the workforce was extended to everyone who failed to prove a conscientious objection to work, it would undergo a miraculous expansion. In the apparently pedantic discussion over the word 'employable', we find that the lives of millions are at stake. So let us probe further.

The history of the concept is traced in a fascinating paper by Roberto Dos Santos.[94] The puzzle facing Keynes and the 'circus' was as follows: they had to convince the profession that 'equilibrium' employment levels would never materialise. According to

[93] The UK government has now replaced 'unemployment benefit' with a 'job-seekers allowance'. In a definition Orwell would have been proud of, the right to this allowance terminates if you don't find work.

[94] The following account is of course my own. In places I have retranslated some citations from Keynes.

Keynes, Pigou's definition admitted only one possible cause – when workers refused work at the current marginal product of labour in 'real' terms. He wished to show another possible cause – some kind of failure of co-ordination which stopped workers and entrepreneurs negotiating the money wage corresponding to the Pigovian ideal.

Actually, there are two ways to derive this conclusion. The most obvious is Marx's. This is to assert that there is no reason equilibrium should ever be attained, and that any real economy persists in a state of permanent non-equilibrium. In Smithian terms, the hidden hand misses. Now, In Marx's day no-one was inventive enough to speak openly of equilibria which did not really exist, so he did not *define* his concept as non-equilibrium. He simply stated the obvious, that a lot of workers were out of work.

Nevertheless, this is a non-equilibrium formulation. It says there is a permanent dynamic imbalance between the actual supply of labour and the actual demand for it; a visible stock of labour-power just like a visible stock of any excess commodity. But whereas excess in other markets can be liquidated, forcibly equating supply post hoc to demand, this is not yet a socially-acceptable method of disposing of excess labour (though the economists seem to be working on it). Therefore the visible expression of supply-demand imbalance, for the particular commodity labour-power, is a permanent excess or, as Marx put it, a reserve army of labour.

This is exactly how it first appeared to Keynes and the circus. They started from the obvious fact that for a prolonged period, workers could be unemployed even though, *if* the economy were to reach equilibrium, this excess stock of workers *would be* (theoretically) removed. In the first galleys of the *General Theory* 'involuntary unemployment in the strict sense' is counterposed to 'so-called unemployment'. Keynes (1973:366) proposed the following definition:

> Men are involuntarily unemployed if the supply of labour which is willing to work for a money wage whose value in terms of wage goods is equal to or lower than that of the existing money wage, is greater than the existing volume of employment

Though subjectivist, this is still the conceptual equivalent of Marx's reserve army of labour. It is a straight excess of current supply over current demand under existing conditions. It means there are workers who aren't working. It is a synonym for plain vanilla unemployment. Evidently Keynes changed this. The core concept of *General Theory* is a *systemic* incapacity, a feature of the system as a whole that cannot be overcome by private negotiations:

> There may exist no expedient by which labour as a whole can reduce its *real* wage to a given figure by making revised *money* bargains with the entrepreneurs (Keynes 1936:13)

And so in the *General Theory* (Keynes 1936:15) we find the following definition:

> Men are involuntarily unemployed if, in the event of a small rise in the price of wage-goods relatively to the money-wage, both the aggregate supply of labour willing to work for the current money-wage and the aggregate demand for it at that wage would be greater than the existing volume of employment

This is a different concept. It no longer speaks of what exists but of a possible alternative existence, which cannot be brought about through private bargains but only by a systemic change. Workers cannot *negotiate* a change in prices. Keynes now defines involuntary employment, not as the difference between the actual workforce and actual employment, but with reference to a hypothetical situation which might arise, were the price of wage-goods to change. The economy, he is saying, is in a non-full-employment equilibrium from which it may only be rescued by systemic changes.

Simultaneous causation and the origin of the doctrinal method in economics

Keynes's final presentation makes the case harder to argue. It rests on proving that *if* there were a systemic adjustment *then* more people would get work. This requires the entire model to be accepted. The opposition, after some time, responded with alternative entire models. With the Keynesians out of power, their model cannot be tested and supply-siders can say that people queuing for jobs are not 'really' (i.e. ideally) employable. They can say that the money wage is too high; but this we can't test because of the minimum wage. Instead of a clash between an ideal system and reality, we now have a doctrinal clash between two ideal systems. And when genuine empirical work intrudes, apoplectic fury.

Why did Keynes take this stand? In my view, because he wished to put another, very strong argument on the table in order to convince his profession. He wished to show that even using their approach, there might be a less-than-full-employment equilibrium. I think, and I do not mean this to be offensive, that he ducked the debate on method to win the debate about policy. This is not objectionable as an exercise in *realpolitik*, but it is not good science. Political expediency is not a source of knowledge; quite the contrary. That is why the debate still rumbles as to whether the essential basis of Keynes's critique is a distinct low-employment equilibrium, or the non-existence of any equilibrium.

Marx's view on this is unambiguous: Equilibrium Just Doesn't Happen. Supply does not match demand. This is not because of price-stickiness, imperfections, trade unions, exogenous shocks or any other such daemonic influence. It is because equilibrium Just Ain't So. This is the ground on which some critics are starting to stand, but which far too many refuse for the purely dogmatic reason that they are too scared to share it with the Savage Moor of Trier.

Simultaneism and subjectivism: the rocky road to a marriage made in heaven

The above history shows how two pillars of neoclassical economics – simultaneous causation and a subjective definition of key variables – came together. This is because, as Marshall observed, simultaneous causation is needed to support a subjective definition of value. The combination runs through all of economics. Let us retrace the history of the debate:

1) the labour force is defined by marginalism in terms of desire instead of capacity.
2) This demands a *calculus of desires* which, however, have no visible measure; we can observe only the outcome of their interaction with other desires. The observables of this calculus are not objects but outcomes. It begins to refer to ideal concatenations of objects in place of the actual objects.
3) Material being becomes an alien threat in the brains of the economists. Production is an activity in time; but producers' desires at the beginning are supposed to to express the consumer's desires at the end. *Causation must be reversed*. Wages cannot be the result of work; work must be the result of wages. Heaven forbid, we might put the unemployed to work to create their own livelihood.
4) Workers must now wait for Money to decree the wage that will call forth their desires. Since real causation does not work like this, it must be replaced by ideal causation in the economists' heads; Marshall's 'simultaneous and mutual interaction of all factors'.

5) But now the procedure for defining models from concepts is reversed: unemployment is *redefined.* Instead of the difference between 'wanting' and 'getting' work it becomes the difference between those working now and those who *would be working* in an *ideal situation*. It is no longer an observable, but is defined by the model and has become a purely doctrinal entity.

So it was that subjectivism met simultaneism on its way to heaven. The offspring of the union was, however, a new family of concepts. As before they refer to a state of consciousness. But this was originally in some sense directly accessible so that, for example, to find out if someone was employable, one asked them. Equilibrium concepts such as NAIRU are a new departure; they are defined by a non-observable ideal. Workers are never found in the actual state in which to observe whether they have become indolent burdens on the state. We shall never know if they *would* accept work at the market-clearing real wage, because we never get to try it.[95] This is all wrapped up in 'conventional good sense' and learned lectures about about models, levels of abstraction and successive approximations which underwrite a hearty disdain for actually publishing or studying anything critical of this divine order. The outcome, however, is a purely doctrinal approach to reality.

The ideal, the real and the abstract in the standard interpretation

At first sight the standard interpretation of Marx is a direct negation of subjectivism, being defined in allegedly pure physical terms. In the next part of this paper we aim to show that through convergent evolution it has reached the same conclusions. Neoclassical marginalism begins from subjectivism and arrived at simultaneism; neoclassical Marxism, we want to demonstrate, began from simultaneism and arrived at subjectivism.

Since this will cause distress, can I first call attention to an important effect of simultaneous causation. In the the standard reading of Marx, price does not *mean* 'price'. It does not have the normal, street meaning of the money paid for a thing or a service. It means 'the theoretical rate of exchange which would be realised, were the economy to attain a steady state with supply equal to demand and the full mobility of capital'. Likewise profit does not mean 'profit'. It has lost the normal business sense of the difference between gross worth in money terms at the beginning and the end of a period. It means 'the profit which would be attained, were the economy to reach a steady state' or more obscurely, 'consumed inputs times one minus the reciprocal of the maximal eigenvalue of the technical coefficient matrix'.

Though this separation between real and ideal is exactly the same as in marginal theory, it is generally defended with different arguments, chiefly about appearance and essence. But this transforms the concept of 'essence' itself. In the standard reading, value – the 'essence' of price – does not mean 'value' in the street sense of the word. It means a theoretical rate of exchange realised in 'a society in which each producer owns his own means of production and satisfies his manifold needs by exchange with other similarly situated producers' (Sweezy 1970:23), or in some other society which *would* exist *were* the economy to attain a steady state with supply equal to demand and no mobility of capital, or *were* all sectors to have equal organic compositions, or were the profit rate to be zero. Essence so conceived is purely ideal; it refers to a hypothetical state of affairs, other than that which actually exists. It does not manifest itself in any actual object.

Neither Marx nor Hegel distinguished essence from appearance in this way. To say essence is concealed does not mean it is ineffable; it simply means one cannot understand it without thinking about it. To say the essence of food is nourishment does not mean the food gets eaten while the nourishment does not, as if the shops had a virtual shelf for intellectuals and a plebian shelf for the earthy bits. It means that to determine whether something really is food, one has to find out if it is nourishing; if one is not aware of this, one will miss a great deal of the point of food.[96]

The same mutation has taken place in the abstract-concrete distinction. To say that abstract labour is the essence of price does not mean that concrete labour is real work while abstract labour is not, or that the two happen in different places as if abstract labour were astral and concrete labour were earthly. It is necessary to emphasise this because many critics approach the issues we raise with minds conditioned by the neoclassical procedure of substituting the unmanifest ideal for the manifest real. From this standpoint they simply refuse to recognise that quite commonplace ideas might lie behind the concept of value. In seeking to demolish this lofty superstructure our project is not just iconoclastic. It supports a definite alternative paradigm which, we believe, also happens to be Marx's. The significance of the new debate is not that it shows this paradigm to be 'correct' or the 'direct line to Marx'. What it shows is that the paradigm is *consistent*. It therefore has a right to exist.

In what follows I shall assert, indeed insist, that very commonplace ideas lie behind the concept of value; that it is an actual and observable property of a really functioning economy and does not require an ideal or model either to define or quantify it, that it is clearly distinguished from price, and that the distinction is vital to the critique of political economy and the understanding of the world. Critics are entitled to disagree with this assertion; they are no longer entitled to dismiss it.

Boskin meets Marx: price level, real output and value

What is value?

In conventional Marxology, as we have observed, value is either legendary or mythological. It cannot be directly observed but exists in a state of being called 'Simple Commodity Production' which may have occurred in the past, or might exist if all organic compositions were equal, or if there was no profit, or if capital was immobilised. In real life, value exists as a directly observable, though abstract, substance. The 'proof'

[95] Except of course in poor countries, where Western economists get to test things that would even cause moral qualms among tobacco executives. These experiments are always unaccountably ruined by exogenous factors such as genocide.

[96] As many do. The conception of essence in question seems to originate with Plato, for whom the observed motion of the planets was not their true being; their essence was a (divinely ordained) perfect orbit. Aristotle sought to differentiate himself from this: "The mistake [according to Aristotle] made by the ideal theory of Plato is that of attempting to abstract from matter entities in whose very nature, unlike that of mathematical objects, matter is involved" (Ross 1995:71). Not so Walras: "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, my emphasis)

is the same as the 'proof' that space or time exist: no economist can put together a coherent argument without talking about it or an equivalent concept.

Value is what money buys. Not one school of thought fails to distinguish nominal price from 'something' real that money buys. They may not call it value (though they often do, as when inflation is defined as a 'fall in the value of money' or when shops advertise 'value for money') but they always make the distinction. Take one of the oldest and most controversial assertion of all economics: the quantity theory of money. This asserts that

$$MV = PT$$

Where M is the money supply and has the dimension of money, V is the velocity of circulation, and has dimension of inverse unit time, P is the price level and has the dimension of money per 'something' and T is transactions per unit time has the dimension of 'something' per unit time. That 'something' is value. To deny this exists is simply fraudulent. It makes no difference that it gets renamed to 'real output'; it *refers to the same object*, or more accurately the same substance. This equation could not be written down, would make no sense at all, unless T were already conceived of – and already was in reality – a homogenous, abstract measure of some single thing, some substance that is quantified. The mere distinction of 'real' from 'nominal' would be impossible unless there was a conception that 'real' income exists and has a single measure that differs from the money that is paid for it. Indeed, the real proof that value exists is that no-one can avoid talking about it, though they may refer to it with a variety of names. The scientific problem is not to prove the existence of something everyone knows to be there; it is either to define clearly what it is or prove it is an illusion.

Indeed there is a procedure for calculating it; the *neoclassical* value of any bundle of commodities is the observed price of the bundle of commodities divided by the neoclassical price level. So it has an operational definition even if its authors deny parentage.

The importance of this is that whenever economists discuss such concepts as profit, distribution, the production function, capital-intensity or capital-labour substitution, what they have in mind is a value-based measure. Since all important magnitudes are denominated in money, in nominal terms, they are always converted into real terms.[97] But in so doing, a concept of value is applied, whether consciously or not. The definition of these terms thus always depends on the implicit or explicit concept of value which informs the conversion.

Normally the debate on Marx's theory of accumulation culminates in a judgment using the neoclassical measure of value. Mostly, economists do not realise they are doing this because they do not reflect on the conception of value which is implicit in their arguments and operational procedures. But as we have said, it is not Marx but neoclassical economics in the dock. We therefore propose the reverse process, which is to conduct a learned study of neoclassical procedures and judge the results using Marx's measures, in whatever reading is considered appropriate. Our first task, therefore, is to study the concept of value in neoclassical economics, as revealed by its practical modern debates.

Enter Boskin

The Boskin commission was set up to enquire into the consumer price index. It has rumbled for a while through the bowels of the US mandarinate from whence it erupted at the end of last year. Its antecedents, as well as its programme, date from Marie-Antoinette. Its argument is this: changes in consumption patterns of the population resulting from falling money incomes must be incorporated into the definition of the standard of life. In short, they want to put Marx's 'moral and historical element of the wage' into reverse.

It was established to further a research programme from somewhere in Newt-land to prove the rate of inflation in the US economy was over-estimated. The political significance is that 30% of US welfare payments (according to the commission) are index-linked. If inflation is over-estimated then these payments are overstated. The commission's rather gruesome presentation to the 1997 ASSA claimed, if I remember rightly, that the state could save up to $250bn as a result.

The reasoning was technical but boiled down to this: the existing index fails to recognise that consumers are substituting closely-related use-values in response to changes in price. If, for example, they can respond to dearer margarine by switching to cheaper brands, the commission argues their standard of living hasn't changed. Similarly, 'outlet substitution' saves them money by shopping at cheaper places and further effects, such as the changing durability of second-hand goods (i.e. using them longer), should be taken into account.

The profession's response at the ASSA was valiant but weak[98] and I don't think it is hard to see why. The conceptual ground had already been surrendered with the idea that the best measure of output is a level of satisfaction; that is, that output should be measured subjectively.

Of course it is vital to measure the standard of living and the index does it. The dispute arises because it is a disguised general measure of value; in practice it is not a standard of consumption but *output*, that is, productive effort. Through the index, 'real' output (that is, value by this definition) has come to mean the *satisfaction a set of goods provides*, instead of the *social effort required to produce them*. A nominal increase in price no longer means, as it did for Marx, a rise in the quantity of labour represented by a given sum of money, but a rise in the satisfaction it can purchase. These are simply not the same.

But this revision changes the answer to every question; when a labour measure says workers are getting less, the neoclassical measure says they are getting more. The currency can be rising in labour terms yet falling in neoclassical terms. The neoclassical capital-output ratio will falling while the organic composition rises. Marx will report a labour-saving bias when the neoclassicals reports a capital-saving bias, a falling rate of profit when they report a rising rate, and so on. At every point of concern to society

[97] It might be thought that the rate of profit, being a ratio, is immune to this criticism. But the precise importance of a proper dynamic or temporal formalisation is that since the 'price level' changes over time, capital stock is revalued on a different scale to output so that the time-path of the monetary expression of value makes a decisive quantitative difference.

[98] On this, as on the minimum wage, Clinton seems to have overruled the profession and vetoed the commission proposals. I think if President Clinton (or in the case of the minimum wage, the Republican leadership) stands up to reaction better than the economics profession, history is trying to tell us something.

there is not one but at least *two* quantitative answers. Indeed there are as many neoclassical answers as there are price indices, which to say the least casts doubt on the stability of their results. Yet in the whole discussion on Marx's supposed errors it has evidently never occurred that the critics are not even talking about the same thing; or that their measure of value fails even to distinguish a technical improvement from a change in the price level.

Is this value I see before me? The ideological foundation of neoclassical real output

The difference has a directly political implication which furnishes the actual material, ideological basis for the neoclassical standard of value. A constant standard of living, as a policy principle, means the workforce has no right to benefit from productivity gains. In plain old-fashioned socialist terms, they are deprived of what they make. But this principle was the exact centre of the Boskin commission's presentation, and within the existing framework it could not possibly be challenged on anything except the technical accuracy of the measurements.

Suppose for example the workforce makes twice as much of everything. If they consume the same as before, all extra production will be lost to them. As a distributional principle, a constant living standard surrenders the right to the benefits of all increases in production. If, of course, workers themseves controlled distribution then this would be a mere choice between individual and collective consumption. But if the proceeds pass to other individuals then it is a direct sacrifice of the fruits of labour.

In the history of the concept, the alternative was the egalitarian principle of benefit in proportion to contribution made. This is actually a bourgeois principle; for example it is the basis of all joint ventures. Nevertheless, if applied uniformly, workers would be rewarded in proportion to *effort*, in the same way that the owners of capital are rewarded in proportion to investment. This made it the foundation of the utopian socialist programme who perceived exploitation as a violation of natural right.

Problems arise when it comes to disputes about what constitutes a genuine contribution. The money-owners claim rewards for their capital, the landlords for their land, the pharmaceuticals for patents on mutants, and so on. The timebomb lurking in what Marx termed classical political economy[99] was that it soon discerned that the suppliers of all such contributions acquired them only through the labour of others, entitling the workers to all the output of society, a deduction which economics could not accept whilst retaining the patronage of any other class. It needed a different concept of value, for purely ideological reasons.[100] When it thought the deed complete, it killed off the very idea of value and washed its hands of the crime – one reason it 'doth protest too much' when the concept is re-discussed. But the concept lives on: it is re-incarnated in the neoclassical price index and the corresponding concept of real output which measures not *effort* but *satisfaction*.

This is not a paranoid delusion of Marxian historiagraphy. The distinction was exhaustively described by one of the founding currents of modern economics, the Austrians – above all in the work of Böhm-Bawerk. The distinctive view of the neoclassical school, which unites all its many warring factions, is subjective valuation: the measure of value by the satisfaction of desire or need that it brings. But this is *exactly* the principle which governs all measures of output, capital, wage, exports, imports, savings, or virtually any serious economic variable denominated in money. It is also the standard by which Marx is judged when he is refuted. And it produces *different quantitative results*. It is this latter we now proceed to examine.

The Marie-Antoinette theory of value

The neoclassical concept of price level comes down full square on the side of subjective determination. It *defines value to be the amount of satisfaction* that a use-value provides. Having done this, it then judges Marx by this standard. We'll assess this with a simple subject of some discussion, a single-sector corn model. We call it a model because it's neoclassical. This also lets us specify a one-hour working year to make for simple arithmetic. Suppose in a primitive state of bliss an economy consumes annually 10 units of corn and produces 20 of which 10 are consumed by the 10 workers. If this economy attains a stationary state then the value v per unit of corn produced will be such that

$$10v + 10 = 20v$$

and so $v = 1$. Now suppose ten Friedman dollars whose supply is fixed. These judicious measures set corn at \$1 per bushel. In that case the economy spends \$10 to make \$20 and gives the workers \$10, 'Real Income' is \$10. One dollar represents one hour represents 1 bushel. Nirvana.

Now suppose the landlords decide to raise the fertility of the land. Having asked the workers, who are the experts, they decide on various improvements (which the workers carry out exogenously) and get 30 units of corn for the same seed and labour. Once things have settled down we have a new v given by

$$10v + 10 = 30v$$

and so $v = ½$ and has halved. Due to the quantity theory of value, the Friedman pound has fallen to \$0.50 per unit of corn, net output having doubled. We set aside the mischievous argument that gross output has risen by a mere 50% as a primitive double counting error. Now suppose the workers, good honest folk that they are, enter a discussion with the landlords. Tugging forelocks and scratching their bucolic heads they say: all the extra corn results from our actions or advice so, if it's all right with you, we want it. In support of this they point out that with wages fixed in corn, in money they are now worth only \$5. Money wages have halved.

[99] Which in his terminology did not mean those who measured value by labour, but those who distinguished themselves from the vulgar and the apologetic. "Let me point out once and for all that by classical political economy I mean all the economists who, since the time of W. Petty, have investigated the real internal framework of bourgeois relations of production, as opposed to the vulgar economists who only flounder around within the apparent framework of these relations, ceaselessly ruminate on the materials long since provided by scientific political economy, and seek there plausible explanations of the crudest phenomena for the domestic purposes of the bourgeoisie" (Marx 1990:175)

[100] "In so far as political economy is bourgeois, i.e. insofar as it views the capitalist order as the absolute and ultimate form of social production, instead of as a historically transient stage of development, it can only remain a science while the class struggle remains latent or manifests itself only in isolated and sporadic phenomena…In France and England [in 1830-AF] the bourgeoisie had conquered political power. From that time on, the class struggle took on more and more explicit and threatening forms, both in practice and theory. It sounded the knell of scientific bourgeois economics. It was thenceforth no longer a question of whether this or that theorem was true, but whether it was useful to capital or harmful, expendient or inexpedient, in accordance with police regulations or contrary to them. In place of disinterested inquirers there stepped hired prize-fighters; in place of genuine scientific research, the bad conscience and evil intent of apologetics" (Marx 1990:97)

Not so, say the landlords. Your problem is that you don't understand nominal and real. In fact, Mr Boskin here tells us that in fact, though your money's gone down by a half, he has this consumer price index thingum. And it says a dollar isn't really a dollar. In fact it's two dollars.

– Say what?
– Well we don't understand it either but the fact of the matter is that this Mr Boskin here runs the bank, and he says you're not really getting $5, you're really getting $10.
– Er, how exactly how'd this Mr Boskin get to run a bank?
– Well, we asked him.
– So, let's get this right, want to be clear, you say you have this bank, and it's yours. And you have this Boskin, and he's yours. And, actually, you don't do anything at all. And neither does he. And neither does the bank. But your Boskin, and your Bank, they're going to give you half what we make. And then, you're going to give them half that. Right?
– Right.

Pause.

– Can we have the bank?
– Well, funny you should say that, Mr Boskin here thought you might, and so we got ourselves these here gun things. Anything else you got to say?

Yes. The dispute is not about money but the meaning of money, that is, value, which is *represented* but not *defined* by money. Different value theories give different accounts of the same price data. That is why the data cannot just be used, without interrogating it. The Boskin theory of value says a constant price of corn-based satisfaction is the correct measure of value. But a measure based on effort – for example, labour – gives a different result. We find that the 20 units of net product are worth the same 10 hours as the 10 units were before.[101] By this measure, which is independent of the subjective desires of agents, output has not changed. But by a neoclassical *subjective* measure, output has doubled. Hence:

1) the neoclassical measure of the price level determines the neoclassical measure of real output. This is a subjective, satisfaction-based measure based on quantity of use-value.
2) conversely neoclassical 'real' output (value) treats any increase in use-value terms as an increase in value output regardless of the labour-time is spent on it.
3) a scientific measure of 'real' output (value) will treat as a rise in the output of value *only* an increase in the actual effort of society, in this case the work of the workers, who supplied all the information and all the productive effort. Conversely it will measure the price level as the amount of money that purchases a given amount of average abstract social labour, or as Marx puts it, the *monetary expression of labour time*, so that a nominal rise in prices *means* a rise in the monetary expression of labour time.

[101] Our choice of money units happens to implement this because both the supply of money and the supply of labour are fixed, but clearly if the labour force increased, Friedman money would deflate the economy in value terms.

Having your Keynes and eating it

So far this is nothing to do with the difference between temporal or successivist approaches, and simutaneist approaches. *Even* the simultaneist approach yields this distinction, though few seem to notice. When we study temporal issues with a mind opened by the previous discussion, however, we find it sheds remarkable light on Marx's profit rate theory.

Let's suppose that on the sound advice of Mr Keynes, instead of waiting for the long run the workers and the landlords start discussing the very next September after the second harvest. It's been a good year. Last year, the village spent $10 on 10 bushels of seed corn. In the ground they went in January and out came 30 bushels in September. Everyone is celebrating. However, there's a slight problem. Because of the quantity theory of money, the net output of 20 units of corn is priced at $10, only $0.50 per bushel. Wages are negotiated post hoc and so paid in today's money. As normal, an increase in supply leads to a fall in price though the tight money doesn't help.The landlords draw up their accounts. They look like this:

Costs:	seed corn 10 @ $1=$10;	
	wages 10 @ $0.50 = $5: $15	
Revenues:	sale of 30 bushels @ $0.50	$15
Profits:		zero

They go to the workers. They say, look, we have no profits.

– Profits be danged. You got our corn. And by the way, we spiked your guns.
– Ah. very good point boys, glad you thought of that. Now, we have this Boskin thing, and what it says is: a real dollar is two dollars. So, luck would have it, we really made $30. And you really got $10. And we'll do some deflation-adjusted accounts in real dollars. They're not really real dollars, hahaha, slip of the tongue there, I mean, they are *real* dollars but they're not *really* dollars, if you follow, oh shit, well anyhow it's like this:

Costs:	seed corn 10 @ $1=$10;	
	wages 10 @ $1=$10 :	$20
Revenues:	sale of 30 bushels @ $1	$30
Profits:		$10

Everyone's happy. Wages, profits, beer all round.[102] However, the landlords do have a problem. They have a lot of corn and they have to do something with it. Good Protestants all, they plough back in all 20 bushels. And lo, because of the improvements, up come 70 bushels.

Since the workers haven't had time to make any more workers what with all the excitement, the labour force hasn't changed. There is a net output of 50 bushels and because of the quantity theory of value, corn sinks to $0.20 in Friedman money which, we should recall, is still the actual unit in which bills are settled. Wages – still 10 bushels – are now a mere $2. The landlords do their sums again. They look like this:

[102] The beer is supplied exogenously

Costs:	seed corn 20 @ $0.50=$10,	
	wages 10 @ $0.20=$2	$12
Revenues:	sale of 70 bushels @ $0.20	$14
Profits:		$ 2

The landlords are nervous. They're sitting on 40 bushels of corn, they paid the workers a fifth what they got two years ago, and they have to explain they made two dollars. And if they want to put the corn back into the land, no way can they get it ploughed without the workers doing a bit more. Mr Boskin, they say, this isn't quite working right. No sweat, says Boskin. I've been talking to my friend Mr Keynes. Apparently Mr Friedman just fixed the the money supply, left it running and went out to lunch; but now your output's up and things need a little fixing. Mr Keynes is going put the whole economy on a thing he calls *corn-dollars*. The way these work is, one bushel of corn is always one dollar. Couldn't be simpler, could it? that way, we all know what's going on. We at the bank, we're happy to backdate all the payments and set the record straight: and here's some accounts we prepared earlier:

Year One

Costs:	seed corn 10 @ $1=$10,	
	wages 10 @ $1 = $10	$20
Revenues:	sale of 30 bushels @ $1	$30
Profits:		$10

Year Two

Costs:	seed corn 20 @ $1= $20,	
	wages 10 @ $1= $10	$30
Revenues:	sale of 70 bushels @ $1	$70
Profits:		$40

That's great, say the landlords, but darn it, what if the workers come back for more money? There's a lot more around. Lot more corn too. And we're asking them to work harder.

Boskin thinks for a while and says: Tell you what. My friend Marie, she bakes cake. And with the same corn you can make twice as much cake as you could bread. So, the way I tell it is, that's a hundred percent raise. Now, you want them to work half as hard again. Tell you what we'll do. You give them $8 and they can make 16 cakes. Tell them it's worth $16; that's a sixty percent rise. And because you're generous, you'll let them have it if they only work fifty percent harder. Go to it, fellas.

Weary but exultant, the landlords plod through the dusk to the cornfields to meet the workers. But they aren't working. They're gathered round a flickering fire shaking their sickles whilst in the gloom, a dark, bearded, frock-coated figure addresses them with an umistakable German accent in saintly if beer-sodden tones…

Disputes in successivist valuation

Now, what might the bearded figure be saying? Well, that's what the debate's about. I think it would be something like this: I understand you want to take over the bank. If that's what you want I won't stop you but as I told Mr Darimon only last week, if you want to do that you'll have to take over the business too.

–I suggest to get ready, you rework the accounts to show what the landlords and their cronies have been up to. You can use something Mr Darimon calls *labour-money* though I wouldn't recommend using it to run the economy. A dollar of labour-money always represents the same amount of your work. We're all equal so no matter whose work it is, or when you did it, a dollar is always an hour. I'll do the accounts in labour-money to show you. I see it like this: in year one, you started with ten hours in corn. That makes the first year like this:

Your past work:	seed corn 10 @ $1 = $10 $10	
Your present work:	10 hours @ $1 per hour	$10
Results:		$20

–In the second year, things were not really very different. You worked the same time and so this part of the accounts look just the same:

Your past work:	seed corn 10 @ $1 = $10 $10	
Your present work:	10 hours @ $1 per hour	$10
Results:		$20

–But this work was embodied in 30 bushels of corn instead of 20, because of the improvements that you made, acting under the instructions of the landlords, who took your advice how to do it. So the price of the corn changed. The total price didn't change and nor did the total labour, because you didn't work any harder. But there were 30 bushels of it and so each bushel was worth $\$^2/_3$. And because you didn't consume any more, that left some over for the landlords. In terms of labour-dollars it went like this:

Replacement for outlays of $10		$10
Wages:	10 bushels @ $\$^2/_3$ per bushel	$\$6^2/_3$
Profits	$10 – $6.67	$\$3^1/_3$

–Now let's look at year three. 20 bushels of your output from year one were ploughed back in. That was two-thirds the total output, which was $20, 20 hours. Two-thirds of 20 is $13^1/_3$. I could show you this in hours, but just to satisfy Mr Boskin let's do it in labour-dollars:

Your past work:	seed corn 20 @ $\$^2/_3$	$\$13^1/_3$
Your present work:	10 hours @ $1 per hour	$10
Results:		$\$23^1/_3$

–Just like before, you now have to see how much labour there is in the corn you just made. You made 70 bushels this time so each was worth [$\$23^1/_3$ divided by 70] = $\$^1/_3$ – it represented one-third of the hours that you worked, taking into account the fact that in the earlier years, you didn't produce so much per hour as you can now. Now let's look at the distribution of the results:

Replacement for outlays of $\$13^1/_3$		$\$13^1/_3$
Wages:	corn wages 10 @ $\$^1/_3$ per bushel	$\$3^1/_3$
Profits	$10 – $\$3^1/_3$	$\$6^2/_3$

–So you see, at the beginning you drew all the benefit from your own work, but now you draw only one-third. And the landlords, who did nothing but take your advice and feed it back to you, draw two-thirds of all the work that went into this year's corn.

The workers are livid but puzzled.

– They been cutting our wages for two years now, and that there Mr Keynes says they were keeping it steady.

– Sure, but remember what it was like under that Mr Friedman: why, we were down to two dollars. If we used this Dr Marx's money then we'd be almost as bad off as we were back then.

– Hang on, says a third, there's something wrong here.

– Say what?

– Well, according to these here figures, if we'd taken all the profits, we'd have made $10 every year, right?

– Sure, that's because you work 10 hours and each hour is a dollar, right?

– But, the first year we'd have put $10 into the business so we'd have made 100 percent profit, right?

– Right.

– But in the second year we'd have put in $\$13^{1}/_{3}$ and still only made $10, so we'd have made 75 percent, right?

– Right.

– And if we put all this corn back in next year, after we took our wages out, it'd be worth $20, and we'd *still* only make $10 extra so our profit would be down to 50 percent, right?

– Sure. I call that the general law of capitalist accumulation. There are two ways out; you can take over, or you can have a slump.

Pause.

– Where can we get a slump?

– *Bitte?* Hmmph. Well, *it* gets *you*. For example, if next year you plant 20 bushels of corn again, then it won't be worth as much as it was last year. Your investment will be only $20@\$^{1}/_{3,}$, that's $\$6^{2}/_{3}$ – half what the same amount of corn cost last year. If you all got work then the profit would get up to 150%. But unfortunately it won't be like that, because if productivity keeps rising they'll probably only need half of you. Profits will be up to 75%, but half of you will be out of work.

Pause.

– But that don't make sense. How come when we're making *more* corn every year, the returns are going *down*?

An expansive figure walks into the firelight waving a cigar.

– Hi fellas, how y'all doing, like y'all to meet a friend of mine. Name of Bortkiewicz…

The value of meaning and the meaning of value

> 'When *I* use a word', Humpty Dumpty said in a rather scornful tone, 'it means just what I choose it to mean – neither more nor less.'
> 'The question is', said Alice, 'whether you *can* make words mean so many different things.'
> 'The question is,' said Humpty Dumpty, 'which is to be master – that's all'
> – *Through the Looking-Glass, and what Alice Found There,* by Lewis Carrol

Meet my friend Bortkiewicz the sequentialist

What would Bortkiewicz say? Well, first off, I think he would have a new difference with the whole procedure. He would want two sets of accounts, one for value and the other for price. In this respect he differs from Boskin, who says there is one set of *accounts* but two *valuations* or interpretations of these accounts. This is because Boskin has to run the bank, and unlike Bortkiewicz he cannot allow value to disappear. In the first year this causes no problem and the accounts do not differ except in the manner of presentation. For year 1 the value accounts can be written like Marx's:

Year One

Past work:	seed corn 10 @ $1 = $10 $10	
Present work:	10 hours @ $1 per hour	$10
Results:		$20

of which

Replacement for outlays of $10		$10
Wages:	10 bushels @ $1 per bushel	$10
Profits	$10–$10	$0

The price accounts are at this point only presented differently in that profits appear not as a deduction from returns but a markup on cost (at this point zero); that is, a contribution to output.

Costs:	seed corn 10 @ $1=$10,	
	wages 10 @ $1 = $10	$20
Profits:		$0
Revenues:	sale of 30 bushels @ $1	$20

Even at this point, of course, the price accounts would differ from the value accounts if there was more than one output and non-zero profits. However there is a far more significant difference, not between price and value, but between Marx's accounts and Bortkiewicz's accounts. Marx not unreasonably recognises that the price at which corn is sold at the end of year 1 is the same as the price of seed corn at the beginning of year 2. He also recognises that the price of corn at the end of year 2 is the same as the price of seed corn at the beginning of year 3.

Bortkiewicz doesn't calculate like this. He's got Professor Böhm-Bawerk breathing down his neck at night school. He 'corrects' Marx's non-existent failure to transform inputs in order to smuggle in his own principle, or more precisely Walras's principle, that the price of the corn at the beginning of the year must be the same as the price at the end. Otherwise he cannot 'simultaneously and mutually' determine anything at all. He decides to reason as follows: in year 2 the value of the seed corn is determined, not by what it actually cost at the end of year 1, but by what it *would* cost, *were* the society

concerned to reproduce itself at the same level indefinitely. He has replaced Marx's *realist* principle, that both price and value measure what actually takes place, with the Walrasian *idealist* principle that they measure what *would* take place *if* the world were different.

His second year accounts are therefore based on a price that would be needed to reproduce the economy identically, if the workers got all the profits. He adopts a (value) price that solves:

$$10p + 10 = 30p$$

that is, p = \$0.50. His value accounts then read

Past work:	seed corn 10 bushels @ \$0.50	\$ 5
Present work:	10 hours @ \$0.50 per hour	\$ 5
Results:		\$10

But at this point Mr Boskin intervenes. This could cause the bank a few problems; at the end of year 1, they bought all the corn at the year 1 price of \$1 and paid \$20 for it. After selling 10 bushels back to the workers for \$10 that left it 10 bushels worth \$10. Now Bortkiewicz says they sell it for \$5. That means the bank takes a hit of \$5 which *vanished in pure circulation*. And if productivity had fallen, the bank would be left with a money profit. *Value would have been created in circulation*.

When the bank gets value for nothing, we worry. But when the bank loses value, the bank worries. Actually, the scientific principle underlying both worries is the same: in actual commodity exchange, value cannot be destroyed or created over society as a whole. Since in this case the bank is the universal purchaser, it is Boskin who feels the pain. You can't sell that stuff for fifty cents, he says. We bought it for a dollar.

– Nmrf pm.

– say what?

– Numrr prblm...

– Speak up!

– *NUMERAIRE PROBLEM*! You deaf?

Pause

Nother pause

– Tell you what. Why don't you tell me, very slowly, what *exactly* a numeraire is, my friend? And do try to remember there are people watching. OK?

– Look, actually it's completely arbitrary what we say the price is. Money's a veil, see? Doesn't really matter. It's, you see... er, you wouldn't like to point that sickle somewhere else would you? Ever so kind. Now, the point is, all that *really* matters is how much corn a man is worth, or perhaps you'd prefer it this way, how much man a corn is worth. I call these *relative prices*. In the first year we said a man was one corn. Herr Marx's labour-dollars were just the same as Mr Keynes's corn-dollars. But in the second year, men made more corn. So, corn-dollars weren't the same as labour-dollars any more. Now, this doesn't have to have anything to do with money. All that really matters is relative prices; how much corn-dollar you get for one labour-dollar.

– You wouldn't like to put that in language the shareholders understand, would you?

– Sure. What you do is, you say the money-value-added has doubled. A year-two hour is worth twice a year-one hour. Because it made twice as much. I'm sure you're familiar with this argument. That is, you *rewrite labour-dollars as corn-dollars*. Then the accounts look like this:

Past work:	seed corn 10 bushels @ \$1	\$10
Present work:	10 hours @ \$2 per hour	\$20
Results:		\$30

Now let's look at the wages. Workers are still getting 10 bushels. Corn costs a dollar.

Replacement for outlays of \$10		\$10
Wages:	corn wages 10 @ \$1	\$10
Profits		\$10

And, seeing as you're worried about the shareholders, we'll draw up a set of accounts for them too:

Costs:	seed corn 10 @ \$1=\$10, wages 10 @ \$1 = \$10	\$20
Profits at 50%		\$10
Revenues:	sum of costs and profits	\$30

– Now this is looking good, says Boskin. In fact, it looks exactly the same as the accounts I got from that Mr Keynes. But where did that 50% come from?

– It's a little idea I got from my friends the Professors Perron and Frobenius. I need it to make sure the price at the end is the same as the price at the beginning. You don't need to worry how it works. All that matters is this: it makes sure that the inputs and the outputs are the same price, measured in corn-dollars. Just think of it as a 'correction'.

What Bortkiewicz has agreed with the bank, in order to make sure that in terms of *his* value nothing is created or destroyed in circulation, is to double the monetary expression of labour-time. But in so doing, he has literally added one and one to make three. If we translate from his dollars back into hours, we find the past work of the labourers that was previously expressed in \$10 in year 1 was 10 hours. That's the value in the seed corn of year 2. But Bortkiewicz takes this 10 hours of dead labour and adds it to 10 hours of living labour by doubling the number of hours that the year 2 labour counts for. This he does by doubling the money value that they add. His difference with Marx is that he makes the workers add \$2 in year 2, and \$1 in year 1. He *adjusts the value-contribution of labour in line with productivity*. Thus, in year 3 we have the following equation:

$$20p + 10 = 70p$$

so that p = \$0.20. Now if the bankers weren't watching, Bortkiewicz could write, using labour-dollars

Past work:	seed corn 20 bushels @ \$0.20	\$ 4
Present work:	10 hours @ \$1 per hour	\$10
Results:		\$14

But he can't write this, because the bankers won't let the farmers pay \$0.20 for the seed when it was purchased for \$1. However, there is a way which still preserves the form of

the equation; he adds a factor for the *intensity of labour* or *money-value creating capacity* of an hour of labour. Call this *i*. Then we can write

$$20p + 10i = 70p$$

In that case with the bankers' constraint (input price of year 3 = output price of year 2) what we have is $p = 1$ (corn dollars) and therefore $i = 5$; labour now counts for 5. That multiplies all the accounts by 5 to yield

Past work:	seed corn 20 bushels @ $1	$20
Present work:	10 hours @ $5 per hour	$50
Results:		$70

Again, just like Keynes. But this isn't totally satisfactory. The discrepancy between the vbalue-creating capacity of labour, and its reward, is a little too obvious. Therefore, we present a *second set* of accounts in the style of the business community in which the value-contribution of labour is replaced by two contributions, one from labour and one from the capitalist-landlords:

Costs:	seed corn 20 @ $1=$20,	
	wages 10 @ $1 = $10	$30
Profits at 110%		$40
Revenues:	sum of costs and profits	$70

and the transformation is complete. *Labour-dollars have been transformed into corn-dollars.* Marx's labour value accounts have been transformed into neoclassical value accounts.

This is what Bortkiewicz's transformation really consists of, to paraphrase Samuelson. Write down a set of value accounts. Write down another set of use-value accounts. Find a numéraire that takes the first into the second. Rub out time; the transformation is complete.

The physicalist project and the close of the simultaneist system

The outcome and meaning of the Sraffa project

By popular request and in deference to the non-mathematical reader we presented the above argument without matrices and with the bare minimum of equations. However, the result is general and rigorously provable. Indeed it appears in a variety of replies to our results concerning the falling rate of profit, which have responded by arguing, either that we are not measuring value, or that value is destroyed or created at inopportune moments if our method is applied. What emerges is the following: a different concepts of value has been brought into play. Our results are 'falsified' by contrasting them with results obtained by substituting a *measure in terms of use-value for a measure in terms of labour-time*.

This may be achieved in a variety of ways. For example, as we have shown, any 'simultaneous' system can be converted to provide a temporal sequence in which output prices at the end of each period are equated to input prices at the start of the next period, by applying a different numéraire in this next period – that is, by multiplying all prices by the same constant conversion factor. This factor, however, redefines the value added by labour so that one hour in a later period adds more value than one hour of the previous period, in proportion to the rise in productivity from one period to the next. This is what Boskin made Bortkiewicz do, above. But in this case labour-time ceases to be the measure of value, because the value contribution of each hour of labour comes to be determined (backwards in time) by the use-value it creates. Our 'error' consists in rejecting a use-value-based conversion factor.

Alternatively, it may be asserted that the value-contribution of each specific type of concrete labour is distinct. If combined with the notion that this value-contribution is a multiple of the (heterogeneous) wage, then the value-contribution of labour is reduced to a multiple of *another* value, measured moreover in use-value terms. Again our 'error' in not agreeing to this correction consists in rejecting the idea that the value contribution of labour-power is in some sense a *function of other values*, and in insisting instead that the value contribution of labour-power is given independently of other values.[103] This is the real core of the present discussion around skilled and complex labour. In fact it is not essential to temporal determination that the value-contribution of labour be identical for all types of labour-power. What is essential is that it be given *independent of other values*. Once made structurally or funtionally dependent on some other value, that is, once the requirement of an independent source of value is abandoned, then the whole procedure becomes nothing more than the determination of values from other values and – as the redundancy debate proves – is mathematically equivalent to a use-value determination of value.

The real issue for value theory is this: these 'physical' standards of value produce the *same determination of value* as if money merely tracks the increase in productivity, that is, the same results as a straightforward neoclassical calculation where nominal prices are reduced to real prices using a gross-product price index. How can the 'physical' calculation, claimed as the alternative to the 'marginal' calculation, yield the same results? For, the equation system is already the same. Now it turns out that the measure of value is also the same. Operationally, there is no difference.

To examine this in more detail we must go back further into the conceptual roots of what we shall term the 'physicalist project' in economics.

Physicalism and marginalism in the twentieth-century debate

The modern verdict on Marx is that, in effect, he was groping for the surplus approach and failed to make it. At first sight, no catena between subjective concepts and simultaneous causation intrudes on the 'physical' model of the surplus school. Sraffa aimed to remove his system as far as possible from marginalism, and at first sight he has replaced subjective desire by a completely objective means of discussing distribution: the 'physical quantities' of goods consumed and produced. In this sense he responded to the Austrians who set the agenda of the 20th Century discussion by constructing a polarisation between what Böhm-Bawerk termed 'objective' and 'subjective' value

[103] "Admittedly Destutt does say that all things which constitute wealth 'represent the labour which has created them,' but on the other hand, he also says that they acquire their 'two different values' (use-value and exchange-value) from the 'value of labour'. He thus falls into the commonplace error of the vulgar economists, who assume the value of one commodity (here labour) in order to turn to use it to determine the values of other commodities" (Marx 1990:174n). To 'assume the value of labour in order to determine the values of other commodities' means precisely to treat the value added by labour as a variable magnitude given by its cost of production or some other function of other values, instead of an *independently determined* magnitude which enters into the determination of all other values, but is not determined by any of them. This is in my view the crux of Marx's approach to the determination of the magnitude of value.

theories. Sraffa took on a designation we might term 'objectivist and proud' and therein lies the source of the difficulty.

The problem is that the real technical structure of society is not comprised of pure inhuman objects but of *use-values*, which do have a subjective component and cannot be reduced to pure physicality.

The underlying difficulty is then that physicalism, as I shall call it, fails to recognise that the real objects of economic study are social relations, aspects of *society*. It identifies the consumption of use-values with the physical properties of objects. Use-values, however, are in the last analysis not a purely physical attribute of a commodity and it is not possible to treat them as purely inanimate objects, as if they were part of nature with no human aspect. Indeed Marx did have a name for this idea, which is commodity fetishism. This is not just a term of abuse but furnishes an explanation for what has since happened.

Because physicalism has not reflected on the real nature of the objects of which it speaks, it does not pause to consider how their properties are in practice measured. It takes the money values of inputs and outputs (in fact flows of capital) for real physical magnitudes. But since it must distinguish real from nominal, and since it has not thought that there may be a problem in doing this, it simply adopts the neoclassical price index to convert nominal into real. This *imports* the subjective concept of value into both the calculations and the models. All physical quantities thereby acquire a subjective standard of measurement. When this concept fuses with the simultaneous method, the result is a subjective quantification of the technical structure of the economy which masquerades as a physical description.

This is not a negation but a mirror-image of marginalism; Marginalism speaks of desires, needs and satisfactions yet on analysis we find it deals with the things that yield these desires, needs and satisfactions. Physicalism speaks of things but on analysis we find it means the desires, needs and satisfactions which these things provide. The reason for this paradox is that neither things nor desires exist in pure form. What exists is *use-value*, a contradictory unity of natural existence and the human use made of it. The marginalist and physicalist projects share a common concept of value, in reality a *use-value* measure of value.

We have often been asked whether the Sraffa-based conceptualisation has any merit. In my view, of course it does. It began life as, and remains, a brilliant critique of marginalism. Its value is the purpose for which it was set up, namely to conduct an *internal criticism* of neoclassical economics by confronting it with the fact that there implicit within the Walrasian system two quite distinct systems of determination, one in terms of marginal utilities and products and the other in terms of aggregate constraints imposed by the requirements of reproduction.

But an internal critique is a quite different thing from a genuine alternative foundation for political economy. The judgment which I personally would make on the Sraffa project is that it arose from an internal critique of general equilibrium theory and therefore remained bound by that theory. Because general equilibrium is an inadequate basis to understand society, the logical step for 'physicalism' was to break free of it and embark on a conceptualisation of economics rooted in a dynamic analysis of stock-flow relations. But if this is done, unless there is an accompanying concept of value, the system loses it critical power. And of course, since the entire basis of Sraffa's critique was to abstract away from the discrepancies of supply from demand in order to defeat marginalist arguments, the awkward problem must be confronted that in real life supply does not equal demand, and therefore there really are margins (for example, rent) which have to be theorised.

Indeed it is curious that Sraffa's followers did not draw a logical conclusion from the success of his critique; namely that since a purely marginal account is logically impossible, when the marginalists *speak* of pure subjective magnitudes they must *in fact* refer to something else. What the followers should have done, is enquire into what it was that the marginalists were actually speaking about. They would have discovered that it was use-value, and realised that they were themselves simply describing the same thing, with the same equations, using different words. However, in order to draw this conclusion they would have had to confront the same dilemma as Keynes: once they departed general equilbrium, the profession would have largely ceased listening to them. They chose the profession and joined its eighty-year campaign of exclusion against Marx's critique. In the last analysis I believe, though not always consciously, they chose expediency over science.

The physicalist project historically confronted a choice, and took the wrong branch. One way forward was to embark on genuine dynamic analysis in which discrepancies between flows were represented as changes in stock levels, correcting the mathematical error in the comparative static method. Along this route, the problem to be confronted is to construct an adequate measure of value that distinguishes properly between changes in productivity and changes in the price level. This route was clearly specified by Hawkins and Simon themselves who wrote:

> Any system of things may be regarded, at some level of abstraction and with some degree of approximation, as functioning in a stable or steady state. There are, however, potential instabilities in an exchange economy which have no essential connection with the perplexities of the exchange *mechanism*. They are connected with the dynamical coupling between parts of the economy. To study them one must go beyond the Aristotelian mode of thought, in which the system investigated is assumed stable 'by nature', instabilities being conceived of as due to external accidental circumstances. (1949:310)

The Hawkins-Simon condition has come to mean the condition that an economy can be arranged in certain ideal proportions such that it produces a positive net product of every good. In real life no economy does this: instead, it runs down the stocks of the goods it no longer needs. Hawkins and Simon set out to discover the *manner in which this transformation might take place*, that is, the set out to define the characteristics of a dynamic process by investigating the relation between stocks and flows. In their conclusions they identify, fully fifty years ago, the two directions which economics *could have taken*, given this analysis:

> To what extent does the above result depend merely upon the particular model employed? There are several directions in which such a model may be generalised. Its virtue, and its limitation, is that it describes the dynamics of an economy according to the same basic abstraction that is used in physical dynamics; the future course of a system is uniquely determined by general laws connection the behaviour of the variables at adjacent moments in time, starting at arbitrary initial conditions. It has in it no explicit teleological assumptions, unless one wishes to justify the hypothesis of full employment by reference to a collective purpose to maximise the rate of profit…
>
> In one direction, one may wish to replace the hypothesis of full employment by more relaxed assumptions, which postulate restoring forces associated with the possibility of unproductive storage...
>
> A more radical sort of generalisation is that which gets away from the assumption of constant technical coefficients and time constants. If the ingrediuents of production may be mixed in varying proportions with

varying capitals and outputs corresponding, then even under full employment the number of unknowns will exceed the number of technical relations.

Leontieff (1953) himself proceeds directly to a discussion of a dynamic model in chapter 3 of his seminal work. But economics explored neither the 'more radical generalisation' to which Hawkins and Simon refer nor, with few exceptions, the Leontieff dynamic model. On the contrary, it collapsed back into an equilibrium formalisation in which the emphasis was bit by bit shifted precisely to the 'teleological' objective of establishing the prices and proportions which *might hypothetically* reproduce the economy *were it to adopt* these prices and proportions.

The tradition of dynamic analysis founded in stock-flow relations continued into the sixties and for example, in Samuelson, Dorfman and Solow's (1958) *Linear Programming and Economic Analysis* we still find the dynamical Leontieff model assessed at some length. The Hawkins-Simon condition is introduced first as a static condition to define a 'plausible' economy and then re-introduced as a dynamic condition to define when an economy is running down, or accumulating, its stocks. The difference is still at this stage clear but the static model is in the driving seat

> The main difference between the two formulations [static and dynamic – AF] is that in this alternative setup, if the Hawkins-Simon conditions fail to be satisfied by the *a*'s, the system simply runs down gradually over time; the initial stocks are eaten into as flow inputs that the system is too unproductive to make good…[104]
>
> In the dynamic model, at any point of time, the available capital stocks play the role of primary factors. They are historically given quantities, and nonaugmentable *for the moment*, although of course the accumulation of capital is exactly the process we are studying. Final demand now includes both consumption flows and net additions to capital stock.

By the time of Pasinetti's (1976) *Lectures on the theory of Production*, an entirely static conception has taken over. Leontieff's dynamic model is absent. 'Dynamics' consists only of a discussion of the conditions for proportionate growth, that is, the conditions under which an excess supply or demand of any good cannot arise. The Hawkins-Simon conditions are reduced to the negation of the intention for which they were created: Pasinetti simply states that

> Negative commodity components of the net production or negative production coefficients would have no economic meaning.

And even more strongly (p97)

> If the condition were not satisfied, it would mean that the economic system considered is so technically backward as to yield a negative rate of surplus, i.e. to use as means of production greater quantities of commodities than it would then be able to produce. Such a system could obviously [sic] not survive; it would not be viable.

The possibility that technical change might involve a *transition from one state to another* in which the stocks of one good are depleted whilst those of another are increased has vanished from sight; indeed by defining them to have 'no economic meaning' they have been purged from economics. The stock-flow dynamics of the original Leontieff model have simply been written out of the subject.

[104] in reality this represents the replacement of one commodity by another and is the normal mode of operation of a real economy. Society today has a negative net product of 486 computers, because it is replacing them with 586 computers. Samuelson and Dorfman either do not see or do not comment on this because their eyes are on the difficulty of establishing the conditions for an economy to continue reproducing itself *unchanged*, a typical equilibrium fixation.

The reason for this is as follows and is central to the whole issue: for the post-Sraffian school, the technical structure of production must serve as a *determinant of prices* – via Marshallian 'simultaneous and mutual determination'. However, to achieve this aim, any gap between supply and demand – overproduction or underproduction – cannot be permitted. This is because prices in the post-Sraffian system are *defined to be* those prices that will reproduce the economy as Sraffa himself (1962:3) explains:

> There is a unique set of exchange-values which if adopted by the market restores the original distribution of the products and makes it possible for the process to be repeated; such values spring directly from the methods of production.

Clearly, if the market does not restore the original distribution of products, then this set of exchange values will not hold. In the Sraffa system it is not actually *algebraically possible* – if the price of iron is set higher than the reproduction ideal, then the users of iron will obtain less iron and the producers of iron will end up with surplus stocks. And our knowledge of ordinary demand and supply informs us that if the price of iron is too high then likewise there will be a surplus stock at the end.

This is the mode of operation of a real economy. Supply never equates to demand in anything or, as Marx puts it 'only accidentally' and prices are never equal to their theoretical ideal. If, therefore, one pursues the Leontieff dynamic model one finds that *prices are indeterminate*. The notion that these prices can be determined by technical structure is impossible to pursue.

But Sraffa's followers nevertheless pursued this impossible road, and attempted to use the Sraffa system without abandoning general equilibrium. I think this was a step *backward* when compared with the quite promising prospect offered by the *original* project of Hawkins, Simon, Leontieff and the other early pioneers of dynamic analysis. And it led as I have stated to a convergent evolution; it *redefined the concepts* with which these writers began, so that they came to mean in practice the same as their neoclassical counterparts. In my final section I suggest why this was possible.

The thing mode of production

When a physicalist says the profit-rate must rise, and expresses unease or distress at our finding in support of Marx's theory of the tendency of the rate of profit to fall, what is nearly always in mind is the following idea: through technical progress, society produces more and more 'things'. By a kind of physiocratic reasoning, the ever-growing output of things must surely result in an ever-greater surplus and hence ever-greater profits, or an ever-greater wage, depending on the struggle for surplus 'things'.

It then seems very unreasonable that the money or value rate of profit might fall in this process. When we produce illustrations to show that it does, it seems against common sense, as some kind of trick, accident or deceit. Instead of explaining our results our critics always try to explain them *away*. This is a very curious reaction from a scientific point of view, since *mathematically* the problem is that of path-dependence,[105] which is quite well-known and establishes the following: there is a quantitative difference, in the event that the parameters of a system are undergoing secular change, between the predictions of comparative static and genuinely dynamic solutions. This quantitative difference is always in the same direction, and represents the error term involved in

[105] See Freeman, (1996), 'Mr Marx and the neoclassics', presented at the annual conference of the Society for the History of Economic Thought, Vancouver 1996

mistaking the comparative static solution for the true solution. The rigour of this finding from a mathematical point of view is impeccable, and it is curious that though in ten years of debate no error has yet been found,[106] few people are prepared to draw the not unreasonable conclusion that comparative static method is suspect.

In my view the refusal to come to terms with this simple result has a straightforwardly dogmatic character; as I stated earlier, the proof of dogma is reaction to error.

The leap which must be made is to understand that what is at fault is not the temporal method, but the commonsense intuition that arises from attempting to perceive an economy as the production of things by means of things.

The problem is that the physicalist project, the view of an economy as things making things, is unsustainable and mystificatory. It therefore collapses into something else, which is to measure physical goods in money; in short what this speaks of as things, are not things at all but flows of money capital. In the last analysis, it fails to make an adequate distinction between *use-value* and *exchange-value*.

The 'commonsense' view does not realise that it is actually discussing not flows of things but flows of value. It is obliged to confront this fact once it is forced to make allowances for changes in the price level, since it has to admit that a mere doubling of all prices cannot be considered a doubling of wealth. However, the measure of value which it applies is the neoclassical price index, which not only differs quantitatively from Marx's measure of value but injects an irretrievably subjectivist content into the project. In particular, it fails to distinguish changes in productivity from changes in the price level, and in fact treats every rise in productivity as an increase in value production, identifying the neoclassical concept of real output with Marx's.

What is a thing? Real, Material and Physical in the minds of the economists

What makes this confusion possible, however, is an even more primal error: the 'commonsense' view takes a use-value to be a *physical* property of a thing. To grasp this fact we must establish what the abused word 'technical' really means.

What are the 'physical quantities' under discussion? What happens when, through technical progress, the economy begins substituting one good – say a 586 computer – for another quite similar good, say a 486 computer? Or a trainer for a plimsoll? A can of beans for a bunch of beans? A colour TV for a mono TV? A short glance at the world of commodities reveals that no commodity is reproduced identically; the old is constantly replaced by the new. In fact, there is no such thing as the 'net product' beloved of the entire post-Sraffian school. Moreover, most of this school have committed the quite serious logical error of supposing that a positive net product is a necessary condition for positive profits. It isn't.[107] Negative net production of most commodities is the normal state of being of a changing economy.

What society actually produces, consumes and reproduces are *use-values*; the means of satisfying certain human desires. What the 'technical matrix' – if such a thing really exists – consists of, is not flows of goods but flows of *uses*. Therefore, when terms such as the 'real wage' are thrown into discussion as if it was obvious what this consists of, it is in fact not obvious. The real content of the concept of 'real wage', is the satisfaction of a socially-defined conglomerate of subjective requirements. Indeed, it is very hard to see how the wage can be discussed otherwise. Marx long ago recognised this by including in the wage a substantial 'moral and historical' element which is socially defined.

This does not make the real wage unreal. But it does give it a definite subjective content, and one of the tasks of economics is to incorporate this into its treatment of the wage. The endless repetition of the word 'real' as if it were a synonym for 'material' does not escape this any more than the endless use of 'technical' as a synonym for 'natural'.

The production of things by means of things

It might be thought that at least production is free of this taint. However, it is not so simple. Let us, for example, ask what a technical change really consists of and how it enters the technical matrix.[108]

In the first place what is a 'better machine'? When I replace a 486 computer by a 586 computer, I replace a less productive machine by a more productive machine. It is moot whether the use-value is the 'same' but since our task is a critique of an existing concept, let us take this as given. Since the 586 computer is a more productive instance of the use-value 'computing', for the same labour more can be produced. The unthinking way this is usually represented is this: beforehand, one computer could make, say one book with one month's labour; after, another computer can make, say, two books with one month's labour. So, the coefficient of the technical matrix dealing with 'production of books by means of computers' has halved; the input of computers per book is one half what it was. This the rise in productivity is 'due to' the capital investment in a new computer. The debate then turns on whether this substitutes capital for labour, or labour for capital, or some combination of the two.

This discussion is held as if it were completely unproblematic to discuss the question in physical terms. In the above case, the coefficients of labour and of capital have both halved. The investment employs capital and labour in the same proportions, to double output. More 'things' are produced for the same labour so that, it seems intuitively, the surplus available for distribution is larger and so the rate of profit must be larger.

But it is not so simple. What *is* the use-value of a computer? To produce books. What does it *mean* to employ a computer that is twice as productive? It means to employ twice as much of the use-value 'computer'. It means to double the input of 'computer'. So the technical coefficient of computers per book has not altered. It now appears that the investment was a pure labour-saving investment. Indeed, if this programme of interpretation is applied rigorously, it is evident that almost every technical change is a labour-saving substitution in use-value terms.

[106] I would not be so foolish as to predict that none will be found in the future. The point is that one hasn't been found yet, so that as the debate stands formally our critics are what we in the trade call 'wrong'. What are they doing about this? Seeking, not for their own mistakes, but for ours. But they've had ten years to find our mistakes. Isn't it time to look at theirs? That is the issue.

[107] See Freeman, A (1997) 'Positive Profits with a Negative Net Product', presented at the first conference of the European Society for the History of Economic Thought, Marseilles, February 1997

[108] John Ernst's persistence with this question should be acknowledged. My comments owe much to an argument advanced by Paolo Giussani. Any errors are my own.

Can we escape by measuring computer inputs in terms of 'numbers of machines', for example? When I started working with computers, one 'machine' occupied the entire floor of a large factory. The cleaners hung their coats up in the CPU and the engineers drove trucks around in the memory. Its storage was probably slightly less than a modern calculator. Are they both just 'machines'? When we study how statisticians approach this we find something very curious: they use what are called 'hedonic' indices which measure functionality in terms of performance. The word 'hedonic' does not exactly reek of oil and metal.

But the conceptual difficulties go further since, for example, the computer may double the production of books, but treble the production of airflights.

Moroever computers, like most other goods, are not just a means of production. If the worker gives her son a computer as part of the 'real wage' then the measurement of the 'amount of computer' the son gets comes under the classification of the *subjective* pleasure it brings the son.

No matter what subtle distinctions are made in the theory, the market reduces all such distinctions to one common measure by exchanging all use-values against money. It is not possible to take the same computer and sell it to a business for twice as much money as to a consumer on the grounds that it is twice as useful. Against the will of all agents and all theoreticians, money *reduces* all use-values to a common denominator.

Hence if we construct indices to compare 'real' output with 'real' wage, we are not free to assert that the computer when used for the son's pleasure counts a half or double what it does for the factory-owner using it as a means of production. Indeed, in this case the *meaning* of 'physical' surplus would be obliterated if each computer figured in output as two, but in inputs as one. We could double the wealth of society by transferring all the computers from the factories to the sons,[109] in a latter-day equivalent of the Keynes housekeeper trick. We have no choice, to give any meaning to the concept of a technical matrix, but to harmonise the measure of consumption in production and by humans. The very fact of living in a money economy makes it impossible to reduce use-value to a purely physical magnitude.

Many-splendoured things: use-value as unity of natural existence and human satisfaction

These conceptual difficulties are not confronted, as far as I can see from the literature. Maybe I have misssed something. What I see is this: what physicalists actually do is use statistical information from input-output matrices where the data is not derived from any physical measurement at all but is directly represented in the price form.[110]

In mathematics we used to call this a 'hand-waving' argument. The lecturer outlines a general theorem which is rigorous, beautiful and watertight, and then gets to the point where it has to be mapped onto reality. It then emerges that the objects to which the theorem refers have no necessary relation to the objects of reality. At this point, the speaker brings out a visual aid containing images that vaguely correspond on one side to objects in reality, and on the other to ideas in the theorem. Then while the audience is distracted, the speaker waves a hand in the air and says 'it's like this', at which point if timing is good, the coffee arrives.

There is a double elision. First of all, it is alleged that it is possible to speak logically of production as a purely material process with no subjective element. This creates the illusion that the economy concerns 'things' that exist independent of our use of them. Then, finding that the magnitude 'amount of thing' is almost unmeasurable, the economists substitute the measurement *in money* of the things, but wave their hands in the air and speak as if the input-output matrix was really a technical and structural description of a 'thing' economy.

What we really find is the following: what actually exists in society is neither pure private satisfaction nor pure physical magnitude. What actually exists is use-value, the specific combination of satisfaction and physical magnitude which is bought and sold as a commodity. Each half of the general equilibrium project takes one aspect of the totality which use-value consists of, and attempts to make it the sole foundation of a distinct theory as if it were half a Fabergé egg. But this separation is not really possible. Hence when the attempt is made to describe use-value either as pure satisfaction or pure physical magnitude, and to base a system of general exchange entirely on this description, the end result in both cases is the *same*: a system of relative prices that is actually determined neither by satisfaction nor by physicality, but by use-value. We have a system for the *determination of value by the magnitude of use-value*.

The Streetcar named Desire

The core problem is extremely profound: it is that the *subject matter of economics consists of human relations which appear to us as objects* – such as money. Neither the mental nor the material aspect of social relations can be distilled out in some kind of pure form. Political economy cannot be reduced or subordinated to another field of knowledge such as psychology or mechanics. It demands its own concepts, appropriate to its subject matter, just like any other branch of knowledge; in this case the specific concepts appropriate to the study of human relations in the alienated form of commodity relations. Economics really is the study of social relations, and this is not an optional choice for economists. If they seek to define their subject otherwise, they mystify and confuse only themselves, because they seek to define it as something it is not.

And precisely because it is not possible to redefine economics as a natural or naturalistic science, neither is it possible to relegate Marx to the status of an idiosyncratic universalist who 'chose' to combine the study of economics with the study

[109] an idea which has already occurred to many of the sons.

[110] When I raise this with practitioners of the input-output art, they invariably object that the coefficients are dimensionless ratios and therefore independent of prices. Leontieff himself (whose Berlin PhD supervisor was, curiously enough, von Bortkiewicz) was perfectly aware that this was not so and is just as honest about it as his supervisor. He baldly describes input-output analysis as 'the simplified version of the classical general equilibrium theory' (Leontieff 1953:7) He then writes: "All figures in this table are shown in dollars. They might as well have been given in physical units appropriate for the description of the outputs of the individual sectors of the economy – tons of coal bushels of wheat, ton miles of transportation, man-hours of work, and so on. As a matter of fact, the dollar figures entered in each particular row can be interpreted in this sens *provided one defines the physical units in which they have been measured as 'the amount (number of tons, yards, ton miles, or hours) of the particular product purchasable for one dollar at the prevailing 1947 prices*'. (Leontieff 1953:9). The dollar is thus the scale of measurement of all physical units. A rise in the relative price of, say steel, will therefore raise all entries in the steel row (consumption of steel), and diminish all entries in the steel column. The input-output matrix does not at all represent the purely physical structure of production but, on the contrary, it represents the flows of *capital* within the economy, telling us how many *dollars* of iron are required per *dollar* of steel.

of society. Economics is *about* society, and the physicalist flight from this into the technical is just as obscurantist as the marginalist flight into the psychological. The specific problem which Marx set out to investigate is this: how is it, even although all economics is social, the social relations that it deals with do not appear openly and transparently to us? How is it that we can, through the subjective exercise of our wills, bring into being things that confront us as objects independent of our will? How does the *mental and subjective* confronts us as *if it was natural and objective*? The concept of alienation is not, as Althusser sought to establish, merely a humanistic hangover. It is the core scientific concept required in order to understand a society which turns its subjects into objects.

There is a cost in adopting a fully-fledged temporal approach, particularly for anyone who has (like all of us) spent a large part of their life trying to make sense of the old way of thinking. It is a sacrifice to give up so much work and reconstruct conceptual foundations from top to bottom.

But this personal, individual cost has to be weighed in the proper balance. On the other side of the scale comes, first of all, not just the confirmation of one or two ideas about Marx but *all* the questions on which Marx-based analyses takes issue with the reigning orthodoxy, that is, the right to criticise. This right is what was sacrificed when neoclassical economics realised it could not win confrontation on the terrain of either concepts or results, and determined instead to *rule Marx's critique out of court by 'proving' it inconsistent*.

Moreover when we study the arguments of our most sincere critics carefully, what we usually find is that they resist our very general conclusions because it would mean giving up one or at most two quite particular cherished ideas – indeed, it usually turns out that what has to go is not the cherished idea but the cherished way of proving it. Again, the costs and benefits must be weighed up.

Secondly, I repeat that in the dock is not Marx but Marx's target: the economics profession. This is not just a question for scholars but millions – probably billions – of victims of the market economics of the 20th Century. If our conclusions are true, then a very powerful weapon is available to these victims, of which they have been deprived for more than eighty years by the neoclassical reading of Marx. Viewed in this light, I do not really think there is any choice.

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REPLY TO SOME OBJECTIONS

Alan Freeman March 10 1997

In his preface to the paperback edition of *The Death of Economics* Ormerod (1995:vii) wryly notes reactions instantly recognisable to anyone who has ever had the temerity to challenge the economics profession:

> The reviews by orthodox economics have in many cases been hostile, some to the point of abuse. The nature of the criticism is twofold. First, that economists are already aware of the problems which I raise for the discipline, and indeed the reviewers themselves know far more about them than I do. Second, that the book is plain wrong. Despite the contradictory nature of these two arguments, some economists appear to subscribe to them both at the same time.

Because economics as a profession runs on doctrine, no amount of reason can shift its general stance. The matter is different with individuals within that profession. The mere fact of holding this conference testifies to a very healthy development: it is at least possible for individuals with every conceivable reading of Marx to advance their understanding in a genuine, if passionate, exchange of views. The following remarks are addressed not to the obdurate or wilfully obstructive but to try and respond to several serious and constructive objections that we have received, in the course of four years' development of our positions.

Accumulation and the falling rate of profit

The temporal calculation confirms Marx's much-disputed theory of the tendency of the rate of profit to fall. This result is so counter-intuitive that the reaction of many critics is not to explain it, but to explain it *away*.

Yet, in money terms it is a completely reasonable and coherent idea. Accumulation, measured in money, simply means that in each time period, a certain monetary sum is added to capital. Let us suppose, for example, that a business starts with £1000 and that each year, £300 of this is turned over of which £100 is spent on raw materials and depreciation and £100 in wages, and that annual profits are £100. Suppose further that the capitalists each year consume £50. In that case in year 1 we have:

Initial stock	£1000
Less outlays	(£300)
Plus revenue	£400
Less expenses for idle rich	(£50)
New capital stock	£1050

and as long as there is any positive investment – that is, as long as the capitalists do not disinvest in money terms – this must raise the magnitude of capital stock, measured in money. This is, moreover, true *whatever* measure of money is adopted. It does not mean that the capitalists never disaccumulate. On the contrary, that is what a slump consists of. In a slump, the capitalists do not cease producing. They merely lower the level of production to a point where in money terms, because earlier technical changes are still working their way through the system, the moral depreciation of the capital stock causes it to fall in money terms.

So it should be considered why the idea of an ever-increasing capital stock, which is intuitively quite reasonable when thought of like a business, in terms of money, appears so intuitively *unreasonable* to the neoclassical reading of Marx.[111]

Sherlock Holmes once remarked that, when one eliminates the impossible and is left only with the improbable, this is the answer. Having eliminated the possibility that there is a mistake in the actual arithmetic of the temporal calculation, we are left with a different alternative: something is wrong is the neoclassical intuition.

The question I place before those who say that our results are counter-intuitive from a use-value perspective is this: how do *you* square the alternative, simultaneous conclusion with the actual, very simple accounting equations imposed on normal business by the simple rule that investment always adds to stock?

Accounting identities

A comment, rather than an objection, in Duncan Foley's (1997) review of our book is that the last chapter, where I attempt a general mathematical formalization of Marx's determination of value by labour-time, merely provides accounting identities.

I have a number of responses to this important comment. In the first instance, it is incompatible with the objection that the temporal calculation violates the conservation of value (value can be created only in production), a principle which I emphatically agree was a core aspect of Marx's concept of value. For, the accounting identities in my chapter expressed precisely this principle and demonstrated that under completely general conditions (no restrictions on the time-path use-value flows or on prices realised in circulation) value is strictly conserved. I do not quite see how one can simultaneously observe that it is a mere identity, and complain because it is violated. An identity is precisely that which cannot be violated. I think this needs to be explored further.

However I have two deeper reactions. In the intense debate on the OPE-L discussion list (which is unfortunately both closed and private, a state of affairs with which I do not agree but accept as the majority view on the list) one of the most persistent objections to Andrew Kliman's refutation of the Okishio theorem is that it depends on a particular set of assumptions. Actually, I don't think this is mathematically correct. A general theorem is disproved if even one counter-example can be exhibited in which it does not hold. Nevertheless, to avoid precisely this type of objection, I deliberately took the course of abstracting from all special assumptions and all special models. In other words, I sought to establish those laws which must hold for all models, regardless of the assumptions adopted. My own procedure is then criticised on the grounds that it does not state any assumptions.

Again, it does not seem to me both types of objection can be sustained. The objection to Kliman's refutation is that it depends on particular assumptions; the objection to Freeman's refutation is that it makes no particular assumptions. At least one of these objections cannot be sustainable. In my view the underlying basis of both is the same; they are rooted in an uncritical acceptance of the general tendency of economics to substitute ideal models for absent concepts. I sought, in framing certain general abstract principles of value dynamics, to escape this methodology once and for all by posing the same question that the physical sciences normally do, namely, to ask what is *invariant* with respect to an (infinite) set of possible configurations of reality.

A question that certainly springs to my mind is, why 'accounting identities' should be considered a lowly species of thought? Certainly any working physicist, once s/he has constructed the Hamiltonian – the physicists' 'energy accounting identity' seems to believe that all problems of the universe have been solved. This is actually questionable but there is a marked contrast between the two disciplines to be explained. Certainly since Hiroshima no-one could possibly maintain that

$$E=mc^2$$

is an uninformative relationship; it is, nevertheless, precisely a 'mere' identity. More generally (see below) the existence of a time-invariant identity is more or less a proof of existence for core concepts such as energy or mass. In general if any object does not persist over at least some period of time, what basis is there for saying that such a thing exists? Hence if one is to argue that there *is* such a thing as value, as Mirowski points out, then it is rather important to identify the invariant relations in which it participates.

I think that there is good reason to believe this Marx himself has this approach and I think it is poorly understood by economists. I emphatically reject, for example, the idea that Marx's concept of value in Volume I of *Capital* assumes exchange at values. Nothing in the first five chapters supports this idea and several passages, as de Brunhoff notes, explicitly deny it. Chapters 1-5 in my view make perfect sense if understood, just as Euclid's axioms define the abstract properties of all geometries of lines and points, as an attempt to define abstractly what all commodity circulation has in common, regardless of the mode of production or stage of history. Exchange at values is introduced in chapter 7 *after* Marx has established, in chapter 5, what to me is exactly an 'accounting identity'; that value cannot be created in simple circulation. It is precisely because of this identity that any system of exchanges is homomorphic in respect of the relation of exploitation to a system of exchange at values, and I find Marx's procedure very mathematically coherent; since the Chapter 5 identity establishes that the total magnitude of profit is an invariant with respect to all changes in relative price and all nominal changes in the price level, it is perfectly legitimate to study the special and simplest case where commodities exchange in proportion to values, as the canonical form of all homomorphically equivalent sets of actual exchange ratios.

I sought to generalise this identity to deal with the movement of value implicit in a general dynamic stock-flow relation. Since additions to existing stock modify its value and use-value magnitudes independently, and since it cannot be assumed that unit values remain constant, any genuine value dynamics must state the relation between the growth of the use-value of stock and the growth of the value of stock; I simply applied the chapter 5 identity to the total stock of commodities of each type (type defined as a use-value) in the economy, in the same way that I think Marx deduces social from individual value in current production. The coherence of this lies in the fact that the commodities are paid for in money and the stock is value in money, and at any given

[111] I am reminded of Marx's letter to Engels dated August 9th 1862 which says 'the statisticians and practical men in general have been maintaining the existence of absolute rent for the last 35 years, while the (Ricardian) theoreticians have been trying to demonstrate it out of existence by very arbitrary and theoretically feeble abstractions. Up to now in all such quarrels I have always found that the theoreticians have invariably been in the wrong.' Substitute 'falling rate of profit' for 'absolute rent' and you have something rather like the present debate. When bankers discuss falling profit rates they have no trouble with the concept at all. Increase your stock and keep your returns constant, and your rates go down.

moment, a given sum of money represents a given sum of value. My identity therefore necessarily corresponds to the business identity given above.

Capital-circuit models and accounting identities

What puzzles me in Duncan's objection, is that the results of this calculation are I think a true generalisation of his own (1982) capital-circuit formalisation which is indeed expressed as a series of stock-flow identities, though confined I think to value (that is, without reference to use-value, by no means a defect). In this formalisation the *further* assumption of exponential growth is added, but there is no indispensible reason for this assumption and a fruitful source of innovative research has been the work of several authors who explore alternative assumptions. However, what makes this innovation possible is precisely the framework of stock-flow identities; it is unclear therefore why mere accounting identities are held to be uninformative.

Moreover, one possible and quite reasonable assumption in the capital-circuit formalisation is a labour-force which is either constant or grows more slowly than its output is consumed, corresponding to the accumulation of value. This leads directly to a falling profit rate and hence refutes the normal refutation of Marx's TRPF argument, so that this result flows from Duncan's own formalisation and by no means depends on ours.

The deepest issue however concerns an objection raised at the last EEA by David Laibman: without simultaneous determination, in what sense is there a theory of economics? In the absence of any definite and determinate motion of the economy, how can it have any laws? But an accounting identity *is* precisely a law. It states what is invariant with respect to all possible motion. That, in my view, is what a law consists of. The 'law' of gravity cannot be understood as a definite prediction that any particular objects will move definitely up or definitely down; it is simply a description of the invariant relations that must hold between them, regardless of what they do. I think that this is the concept of a 'law' which economics has simply lost sight of.

Finally there is an ontological issue also. What objects 'exist' in a completely free-standing dynamic system? Equilibrium provides no clues. A tornado has no equilibrium, but most definitely exists. The ontological problem in a dynamic framework amounts to this: what is the basis for asserting that something persists in time? An identity for me, and I think for Marx, is precisely a statement of what persists in time and therefore has the character of a *proof of existence*; a great deal of his work goes into establishing that capital reproduces the conditions for its own existence – the two classes, the use-values it requires, the money it requires, and so on. The problem Marx sets himself is to *deduce* reproduction from the category of value. The 'standard interpretation' reverses this, taking reproduction as 'given' (to borrow, with malicious intent, a term from Fred) and from it deduce value.

Inventory adjustment

I cannot see that the difference is an inventory adjustment effect. Inventory adjustment, in my understanding, refers to the item in company profit and loss accounts dealing with opening and closing stock. A trading company will normally calculate its profits from the following equation:

Trading profits = (Revenue *less* Costs) *plus* (Closing stock *less* Opening stock)

Now, if during trading the price of the components of stock have risen, some trading profit will arise from a purely nominal change, as can be seen if the company merely maintains its stock and carries out no trading.[112]

But in the model under discussion in my main paper there *is* no stock. The corn is completely consumed before production starts, and completely new corn springs from the ground. It don't think it is legitimate in accounting terms to count the harvest twice, once as sales and again as inventory. The difference arises because *the price of corn changed in the period of time between when it was planted and when new corn arose from the soil*. This term, the change in price, is a mathematical correction to the simultaneous calculation. I think this really *is* an error term and it is a trifle churlish not just to recognise it as such.

Replacement cost

A second explanation of the difference between the simultaneous and sequential results is the argument that it arises because the temporal method values stock at historical cost whereas the simultaneous method values it at current replacement cost. In particular Fred Moseley has claimed strongly that the temporal calculation is incompatible with Marx's texts since Marx himself clearly stated that the value of new goods are determined by socially necessary labour time. This, he says, supports the principle of simultaneous valuation.

Below we give one of several cases where Marx's value calculation is clearly and explicitly temporal. This is moreover taken from one of the several places where Marx squarely confronts the issue under discussion, namely technical change from one period to the next. At the very least, therefore, if it is sustained that Marx argues elsewhere for a simultaneous calculation, then it must also be asserted that Marx was inconsistent. Having spent eighty years disposing of the profession's calumnious 'proof' of Marx's

[112] The UK National Accounts Sources and Methods (HMSO 1985: sections 13.14–13.32) describes the process in the UK in some detail. The relevant passage (para 13.17) is the following: "Under the FIFO convention each item in stock is valued at its purchase price and the stocks will have been bought at the range of prices that prevailed over this period. This convention gives a book value level of stocks. This level is then reduced to constant, base year prices; that is each item in stock is valued at its average price during the base year. This revaluation is made by the *book value stocks price index* that measures change in the historic cost of stocks; it is described in more detail below. The difference between constant price levels at two moments gives stockbuilding at constant prices over the intervening period. Stockbuilding at constant prices is revalued to give stockbuilding at current prices. This revaluation is by the *current price stocks price index* that measures changes in the current replacement cost of stocks. Finally stockbuilding at current prices is subtracted from the book value change over the same period to give stock appreciation." The purpose of the exercise is to separate two measures of stock building, one due to an actual growth in the 'real value' (constant prices) of stock and one due to monetary changes. Stock appreciation is the difference between the two, the purely monetary effect. However, first of all the measure clearly depends on the mentioned indexes, which are hedonic (use-value based) and therefore neoclassical; second, the revaluation applies only to stocks *in existence during the year* which here is the accounting period of observation. In the case of our corn economy, stocks were ploughed in at the beginning of the period of observation and vanished from the accounts. New stocks were then produced at the end, but the revenue from these stocks is *sales revenue* and it would be entirely wrong to treat them twice, once as sold goods and again as inventory. An application of the calculation method provided by the statisticians on p207 of this book to the corn model yields stocks, in both current and constant prices, of zero, and a stock appreciation of zero.

inconsistency and having discovered that its best brains got this completely wrong, I am inclined in all humility to explore other possibilities first, namely, perhaps Fred is not reading what Marx says as Marx intended it to be read.

In the first place, there is the same problem as with the inventory valuation objection. I would agree that when a change in value takes place, *existing stock* is revalued and indeed, this is the basis for the phenomenon of 'moral depreciation'. But this is not what is under discussion in normal production, particularly with the circulating elements of production such as cotton, corn, and so on. Our temporal correction refers to differences in prices between the *beginning* of production and the *end* of production. But when producing linen, for example, the cotton that was bought at the end of production *no longer exists*. It has been used up in production. How can it be revalued after it has been used? If this principle were applied logically, then also everything that had ever entered production from the beginning of time should be revalued *retrospectively*, and I don't think anything Marx says supports this idea. I think the idea is entirely neoclassical in origin and finds no support in Marx.

Turning now to the process of revaluation that takes place *before* the cotton is consumed I of course agree that it is revalued if new and cheaper cotton arrives on the market. The question is, however, whether it is revalued *completely* to the individual value of the new cotton as soon as one ounce of this hits the market, or whether there is a time-based process so that, as more and more cotton arrives on the market, the existing stock becomes *progressively* cheaper. That is as indicated above, the problem is to state clearly the stock-flow identity that governs the *process* of cheapening of the cotton.

To justify Fred's reading it would have to be shown that Marx held that the revaluation of the cotton was independent of the *volume* of new cotton on the market. But Marx explicitly denies this in his Volume III, chapter 6 remarks on the release and tie-up of capital:

> Thus if 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. The same applies to stocks of raw material, etc. in the hands of the producers. This revluation can compensate the individual capitalist, or a whole particular sphere of capitalist production – even more than compensate, perhaps – for the fall in the rate of profit that follows from the raw material's rise in price. Without going into the detailed effects of competition here, we may remark for the sake of completeness that (1) if there are substantial stocks of raw material in the warehous, they counteract the price increase arising from the conditions of their production; (2) if the semi-finished or finished goods on the market press heavily on the supply, they may prevent the price of these goods from rising in proportion to the price of their raw material…
>
> The smaller the amount of stock to be found in the produciton sphere and on the market at the end of the business year, at the time when raw materials are supplied afresh on a massive scale (or, in the case of agricultural production, after the harvest), the more visible the effect of a change in raw material prices (Capital III:208)

But this is incompatible with the idea that the value or price of production of *new goods* completely determines the value of the commodity, which is the replacement cost hypothesis. It says, on the contrary, that as cheaper goods enter the market there is an averaging process so that, the more fresh goods there are and the less stock, the greater the revaluation; *au contraire* the less fresh goods and the more stock, the lesser the revaluation. Thus goods are *not* revalued to the replacement cost, though they *are* revalued.

In my last chapter of our book, what I set out to do is to discover whether the above argument could be rendered consistent by treating the revaluation process as a *strict averaging*, analogous to the formation of social from individual value. This is I think not only consistent with Marx's general approach to the formation of market or social values from individual values, but fits with all his writings on revaluation, moral depreciation, etc. Indeed it shows, as a by-product, that moral depreciation is a definite and measurable dynamic term in the value equations that is omitted from the static calculation. I discovered that this interpretation rigorously confirms all Marx's contested results and preserves the principle of value conservation; and so far, I have read nothing in Marx that seriously conflicts with it.

Marx's temporal calculation

The difference between historical and replacement cost is discussed in and accounted for in chapter 6 of Volume III of *Capital* under the heading of the 'release and tie-up of constant capital'. Marx first encounters the problem in discussing Ramsay on pp340-344 of the *Theories of Surplus Value*. He concludes a discussion of Ramsay's corn-model by considering a cotton manufacturer with a constant capital of £100 of which £80 is spent on cotton:

> Let us consider the manufacturer. Let us assume that he has laid out £10 in cotton twist and made a profit of £20. The product therefore amounts to £120. It is assumed that £80 out of the outlay of £100 has been paid for cotton. If the price of cotton falls by half, he will now need to spend only £40 on the cotton and £20 on the rest, that is £60 in all (instead of £100) and the profit will be £20 as previously, the total product will amount to £80 (if he does not increase the scale of his production). £40 thus remains in his pocket. He can either spend it or invest it as additional capital. If he invests it, he will lay out [an additional] £$26^{2}/_{3}$ on cotton and £$13^{1}/_{3}$ on labour, etc. On the new scale. The profit [will amount to]£$13^{1}/_{3}$. The total product will now be $60+40+33^{1}/_{3}$ or £$133^{1}/_{3}$.
>
> Thus it is not the fact that the farmer replaces his seed corn in mind which is the key, for the manufacturer buys his cotton and does not replace it out of his own product. What this phenomenon amounts to is this: release of a portion of the capital previously tied up in constant capital, or the conversion of a portion of the capital into revenue. If exactly the same amount of capital is laid out in the reproduction process as previously, then it is the same as if additional capital had been employed on the old scale of production. This is therefore a kind of accumulation which arises from the increased productivity of those branches of industry which supply the productive ingredients of capital. (TSV III:345)

This is a noteworthy passage. Let us just summarise what is going on. In period 1 we have in use-value terms:

80 units of cotton twist + 20 units of labour => 120 units of woven cotton

and in money

£80 cotton twist + £40 added by labour => £120 woven cotton

In the next period cotton's price falls by half. We now have two options discussed by Marx. One is replacement in kind, the other is replacement in value. If the cotton is replaced in kind (the first option) then since cotton is cheaper, the capitalist can maintain production for less money. We have

£40 + £40 added by labour => £80 woven cotton

but the capitalist has 'pocketed £40', that is, of his revenue from period 1 of £120 only £40 was re-invested and his money profit is £20 normal profit plus £40 *released capital*. The value of linen will thus sink to £80 for 120 units, namely £$^{2}/_{3}$ per unit.

If now the capitalist invests this £40 (the normal mode of capitalist accumulation), Marx assumes the technical proportions in the cotton-weaving industry do not change and so it must be split between additional cotton twist and additional labour. Now we have these money outlays:

(£40 + £26$^2/_3$ = £66$^2/_3$) twist + (£20 + £13$^1/_3$ = £33$^1/_3$)

an expansion in production by the factor $^2/_3$. In use-value terms everything expands by $^2/_3$ giving

133$^1/_3$ units of cotton twist + £33$^2/_3$ units of labour => 200 units of woven cotton

Release and tie-up of capital

The *categories* which Marx uses to describe this relate precisely to the time-difference between the price (value) of cotton at the start of the first period and the start of the second. The term 'release of constant capital' refers to the difference between the cost of reproducing on the same scale at the old price and the cost of reproducing on the same scale at the new price. That is the £40 that the 'capitalist pockets'.

If the principle of 'replacement cost valuation' were applied to the output of cotton, then we should make the following observation. This woven cotton, the output of Marx's manufacturer, is also the input to some other manufacturer, for example the shirtmakers. But according to the principle of replacement costing as defined by our critics, replacement valuation must be applied across the board throughout the whole of industry. As far as the shirtmakers are concerned, from the moment that the cotton gets cheaper, the value of linen sinks to its replacement value, namely £80. But in this case, since the shirtmakers must pay exactly the same sum of money that the cotton-weavers receive, Marx would have had to conclude that the sales of the first period were only £80 and consequently that profits were zero, exactly as we encountered in the case of our Landlords applying the Friedman theory of value.

What I tried to do in the last chapter of *Marx and non-Equilibrium Economics* is extend this concept, of the release and tie-up of capital to the evaluation of stock, using the pointers that are to be found in chapter 6 of Volume III of *Capital*. Whether this precisely corresponds with Marx is something for further discussion. What is certainly true is this: by a very logical application of the conceptual structure just outlined we find that not just one of the propositions associated with Marx outlined at the beginning of this article, but *all* of them, can be sustained and in such a way that a logical foundation now exists to apply these results so as to show exactly what is wrong, both quantitatively and qualitatively, with the neoclassical treatments of the same themes – and produce alternative empirical representations with greater explanatory power.

There is an argument to be had, still, over a number of important issues, for example replacement costs, moral depreciation, the exact calculation of the monetary expression of labour time and hence the exact way to do Marx's calculation for the farmworkers above, the proper way to distinguish productive from unproductive labour, the incorporation of domestic labour, and so on and so on. But the crucial point is this: on all the issues at dispute between Marx and neoclassical economics, the analysis confirms Marx and refutes neoclassical economics.

Violation of labour conservation

Finally it has been argued that the temporal calculation results in value being created or destroyed independent of the use of the labour-time of the workers. This seems to me misinformed. On the contrary, the calculations we attribute to Marx follow the strict principle that each year, value should increase only by an amount equal to the living labour of the workers and diminish only by an amount equal to the current value of consumed goods. As I said above, this is an 'accounting identity' and value cannot but be conserved.

However the reverse is the case: simultaneous valuation *does* lead to the creation of value in circulation and this can be seen by considering a circumstances Marx discussed on a number of occasions, namely declining productivity – for example due to bad harvests.

Consider the following sequence

Year 1 10 corn + 10 labour -> 20 corn

Year 2 10 corn + 10 labour -> 15 corn

Year 3 10 corn + 10 labour -> 12 corn

This gives prices as follows

Year 1, 10*p* + 10 = 20*p*; hence *p* = \$1.00

Year 2, 10*p* + 10 = 15*p*; hence *p* = \$2.00

Year 3, 10*p* + 10 = 12*p*; hence *p* = \$5.00

By the end of the sequence, society is producing 12 units of corn with a total value of \$60. But it started with \$10 and it has only added \$30 in value. Where has the extra \$20 come from? Moreover this society is getting *less* productive. How can it be creating *more* value?

It is difficult to track this process because the simultaneous approach makes it impossible to draw up meaningful year-on-year trading accounts. In year 1 the product of 20 bushels is supposed to *sell* for year 1 prices, that is, \$1.00 per year. But in year 2 it is *bought* at year 2 prices, that is \$2. To make sense of this logically incoherent idea[113] one would have to suppose it was bought by an intermediary, for example the bank which might, for example, provide warehousing so that it bought the corn at year 1 prices, stored it, and sold it at year 2 prices.[114] Suppose for simplicity that each year the entire surplus is sold to workers at end-of-year prices (or capitalists, it makes no difference)

The bank's accounts, assuming an initial capital of \$20 for it to buy the harvest, would read as follows for the period between the year 1 harvest and the year 2 planting:

Bank capital	\$20
Purchases of corn at end year 1	
20 bushels at \$1	(\$20)
Sales of corn during year 1	
10 bushels at \$1	\$10

[113] A logically incoherent idea which is, however, at the heart of Bortkiewicz's construction and constitites the principal logical error in the refutation of Marx's results for eighty years

[114] I acknowledge many useful discussions with Riccardo Bellofiore for the origin of this presentation.

Reserves at end year 1	$10
Sales of corn at beginning year 2	
10 bushels to landlords at $2	$20
Reserves at beginning year 2	$30

It can now be seen that the bank's capital has *risen by $10 for the expenditure of no extra labour*, as has that of society as a whole. The holders of circulation stocks in a simultaneous model *really do benefit* from inventory appreciation in price terms; a price increase which, however, if we seek a measure that conserves value (that is, which does not allow value to arise in circulation) must be accounted as a nominal increase in prices.

The temporal account of the same sequence reads like this, supposing corn to start at one labour-dollar per unit and measuring in constant labour-dollars:

Year 1 $10 corn + $10 labour -> $20 embodied in 20 corn; new price of corn is $1

Year 2 $10 corn + $10 labour -> $20 embodied in 15 corn; new price of corn is $1.33

Year 3 $13.33 corn + $10 labour -> $23.33 embodied in 12 corn; new price is $1.94

If the bank, as before, purchased the entire output at the end of each year and sold it back at the end, we would find for example between the year 1 harvest and the year 2 planting

Bank capital	$20
Purchases of corn at end year 1	
20 bushels at $1	($20)
Sales of corn during year 1	
10 bushels at $1	$10
Reserves at end year 1	$10
Sales of corn at beginning year 2	
10 bushels to landlords at $1	$10
Reserves at beginning year 2	$20

For the next year this reads

Bank capital	$20
Purchases of corn at end year 2	
15 bushels at $1.33	($20)
Sales of corn during year 2	
5 bushels at $1.33	$6.67
Reserves at end year 1	$6.67
Sales of corn at beginning year 2	
10 to landlords at $1.33	$13.33
Reserves at beginning year 2	$20

and so on. At the end of year 3 the bank would have insufficient capital to buy the output but we could either assume it starts with a larger capital, or, as I am sure Riccardo would agree, suppose that it can create some credit. The crucial point is that it cannot augment its capital by the mere purchase and sale of corn. If the simultaneous calculation is applied, it can and does and so value is created in pure circulation.

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THE OKISHIO THEOREM: AN OBITUARY

Andrew Kliman

2nd draft. Please obtain author's permission before quoting.

I. Introduction

Karl Marx (1973:748) considered the law of the tendential fall in the profit rate (LTFPR) to be "in every respect the most important law in modern political economy, and the most essential for understanding the most difficult relations." However, the Okishio theorem (Okishio 1961) is generally thought to have refuted this law on logical grounds, in a manner "so devastating that it deprives all arguments (pro and contra) ... of their relevance" (Parijs 1980:9). In other words, it is commonly accepted that Okishio's and subsequent versions of the theorem have shown it to be impossible for profit-maximizing capitalists to adopt labor-saving innovations that cause the equilibrium (uniform) rate of profit to fall.

Much of the subsequent literature has shown, not surprisingly, that by altering one of the theorem's premises, one can derive a fall in the profit rate. If the theorem were true, this would indeed be the only way to derive a falling profit rate. And because the theorem is widely accepted as true, the counter-demonstrations put forward by proponents of the "temporal single-system" interpretation of Marx's value theory (Ernst 1982; Kliman 1988, 1996; Freeman 1996) are - when they are acknowledged at all - commonly regarded as alternative "models" which, like the rest of the literature, alter some premise of the theorem in order to arrive at different results.1

The task of the present paper is to show that, on the contrary,

(a) the Okishio theorem has not been proven;

(b) the TSS counter-demonstrations are genuine refutations, negating the conclusions of the theorem without altering any of its stated premises; and

(c) when the theorem's actual results are stated in a valid manner, they do no damage to the logic of Marx's LTFPR.

My claim, it should be noted, is not that the theorem suffers from a mathematical error. The relevant matrix algebra theorem of Perron and Frobenius, upon which the Okishio theorem is based, is true. Rather, the problem is a disjunction between the actual implication of the mathematics and the economic conclusions which proponents of the Okishio theorem draw from it, namely that if a uniform rate of profit is re-established after a cost-reducing technical change, this profit rate cannot be lower than the initial one. To see this, it will help first to review the theorem briefly.

II. The Okishio Theorem

Because I have claimed that the TSS critiques negate the conclusion of the Okishio theorem without altering any of its premises, it is important to identify which features of the theorem are premises and which are conclusions.

No existing version of the theorem fully spells this out, but I believe the following is faithful to the intentions of the theorem's proponents. The theorem begins from the following premises:

(i) an n-industry capitalist economy

(ii) single-product industries only

(iii)no nonproduced means of production other than labor are used

(iv)the real wage rate is equalized and constant

and an initial state of the economy is considered, in which

(v) initial unit prices are stationary (input and output prices are equal),

and

(vi)the profit rate is equalized across industries.

The next premise, in the no-fixed-capital case,[2] is that

(vii)a new technique will be adopted if and only if it reduces cost per unit of output, when costs are evaluated at current prices,

and the final premise is that

(viii)the profit rate is re-equalized after the adoption of such a new technique.

From these eight premises, proponents of the Okishio theorem use the Perron-Frobenius theorem to draw the following conclusion: the post-innovation profit rate cannot be lower than the initial one, and must be greater than the initial one if the technical innovation occurs in a "basic" industry.

III. The Missing Proof

Let us use r to denote the initial profit rate, and r* to denote that profit rate which proponents of the theorem call the post-innovation profit rate. It is indeed true that r* cannot be lower than r, and that it must be greater than r if the technical change has occurred in a "basic" industry. This much is implied by the Perron-Frobenius theorem. Yet it is insufficient to support the conclusion above. How do we know that r* will be the economy's actual post-innovation uniform profit rate?

The typical answer to this question, and the one which presumably underlies the belief that the Okishio theorem has been proven, is that technical and real wage coefficients, together with the stipulation that the profit rate is equalized across sectors, suffice to determine a unique rate of return on capital advanced. Thus, r* is repeatedly referred to as "the general rate of profit" by Okishio (1961: 90, 93, 99, emphasis added) and as "the equilibrium" profit rate by Roemer (1978:153, 154, emphasis added), implying that if profit rates are equalized across sectors, the level of the uniform profit rate is uniquely determined by physical coefficients. And since premise (viii) stipulates that profit rates are indeed equalized after the technical innovation, then supposedly r* must be the post-innovation profit rate.

Yet, contrary to the apparent belief of the proponents of the Okishio theorem (and most readers of Dmitriev and Sraffa), it is simply not true that the magnitude of the uniform profit rate is uniquely determined by physical input/output coefficients. To demonstrate this crucial point, let us turn to the example in which Sraffa (1960:7) supposedly proves that the uniform profit rate is uniquely determined. He posits the following input/output relations:

280qr. wheat + 12 t. iron -> 575 qr. wheat

120qr. wheat + 8 t. iron -> 20 t. iron

and immediately concludes:

The exchange-ratio which enables the advances [on the left-hand sides] to be replaced and the profits to be distributed to both industries in proportion to their advances [so that

the rate of return on capital advanced is equalized] is 15 qr. of wheat for 1 t. of iron; and the corresponding rate of profits in each industry is 25%.

To obtain 15:1 as the unique exchange ratio, Sraffa implicitly assumes that the exchange ratio between wheat and iron at the time of input is equal to the exchange ratio at the time of output. This will not necessarily be the case, but even if it is, the uniform profit rate is not uniquely determined by the data above, as we shall see presently.

Letting Pwt and Pit be the input prices, and Pwt+1 and Pit+1 be the output prices, of wheat and iron, respectively, Sraffa's exchange ratio implies that Pit = 15 Pwt and that Pit+1 = 15 Pwt+1. The rate of return on capital advanced in the wheat sector is therefore

(575 Pwt+1)/(280 Pwt + 12 Pit) - 1 = (575 Pwt+1)/(280 Pwt + 180 Pwt) - 1

= 1.25(Pwt+1/Pwt) - 1

and the rate of return on capital advanced in the iron sector is

(20 Pit+1)/(120 Pwt + 8 Pit) - 1 = (300 Pwt+1)/(120 Pwt + 120 Pwt) - 1 = 1.25(Pwt+1/Pwt) - 1.

The constant exchange ratio of 15:1 thus guarantees that the two rates of profit are equal. Yet the level of the equilibrium profit rate is still not determined. It depends as well on the ratio of the output to the input price of wheat, and it can vary, theoretically, from -100% to + ()()

Hence, if we imagine this to be the post-innovation profit rate, it can in principle always be lower than the pre-innovation rate, if Pwt+1/Pwt is sufficiently small. If, for instance, the pre-innovation rate was 20%, the post-innovation rate will be lower if Pwt+1/Pwt < 0.96.

In general, then, the magnitude of profit rates, even the magnitude of profit rates that are constrained to be equal, depend on the relationship between output and input prices. The Okishio theorem's r* is therefore simply one particular post-innovation profit rate among an infinite number of possible uniform rates, a rate that corresponds to one particular set of input and output prices. Specifically, r* is that particular uniform profit rate which corresponds to the case in which post-innovation input and output prices are equal. Not only does the establishment of r* as the profit rate require that relative input prices equal relative output prices - that was the case in the example above, and it was shown that this stipulation was insufficient to fix the level of the profit rate - but the absolute prices of commodities must be equal as inputs and as outputs. In other words, it is only by implicitly constraining the output price of wheat to equal its input price (and thereby similarly making the ratio of the output and input prices of iron equal unity) that Sraffa obtains 25% as the unique rate of return on capital advanced, and that proponents of the Okishio theorem obtain r* as the post-innovation profit rate.

Our original question -- how do we know that r* will be the economy's actual post-innovation uniform profit rate? -- can thus be restated as: how do we know that the absolute magnitudes of post-innovation input and output prices will be equal? Unless they are equal, r* will not be the actual post-innovation profit rate, even if profit rates are equalized. Authors who have attempted to prove the Okishio theorem show little recognition of this difficulty. The equality of post-innovation input and output prices is never stated explicitly as a premise of the theorem, nor is it ever proven within the theorem. But since it is absolutely necessary to the theorem's conclusion, the theorem remains unproved.

The problem appears to be that the proponents of the Okishio theorem, along with almost all the post-Sraffa literature, seem simply to have taken for granted that input and output prices must be equal if profit rates are to be equalized. In the passage quoted above, Sraffa (1960:7, emphasis added) speaks of “The exchange-ratio” which permits a uniform rate of return on capital advanced. Actually, exchange ratios of inputs and outputs can differ even with a uniform rate of return; yet, as we have seen, even if they are the same, the level of the rate of return depends on absolute prices, not only relative prices (exchange ratios).

In one of his presentations of the Okishio theorem, Roemer (1978) did evince some awareness that the validity of the theorem depends on the adjustment of post-innovation prices to a stationary state. Employing a two-sector example with the technical change having taken place in sector 1, he wrote the profit rate will immediately rise in sector 1. This will encourage more firms to enter sector 1 from sector 2; prices will be cut in competition and eventually a new equilibrium tableau will emerge [... so that] cost-reducing technical innovations give rise, eventually, to a rise in the equilibrium rate of profit in a competitive situation (Roemer 1978:154, emphases added).

This passage shows clearly that Roemer did not regard the establishment of a stationary post-innovation price vector as a premise of the theorem, but rather as a result of a dynamic adjustment process in which capital flows in search of the highest rate of return and competition leads to adjustments in prices. Instead of proving that the “equilibrium tableau,” in which prices are stationary and r* is the uniform profit rate, “will emerge,” however, he merely asserted it. Apparently he believed that proof was not required because he shared the common, albeit erroneous, belief that if an equalized rate of profit was to re-emerge after the technical innovation (premise (viii)), this would immediately entail that prices had adjusted to a stationary state.

For the sake of maximum clarity, let me stress again that the issue is not whether it has been shown, or can be shown, that profit rates will actually equalize after the adoption of a technical change. Though investigations into the dynamic stability of the Sraffian model have yielded ambiguous conclusions in this regard (see, e.g., Duménil and Livy, 1993), the Okishio theorem is restricted, and commonly understood to be restricted, to cases in which a uniform rate of profit is indeed re-established.3 Rather, the issue is whether the capital mobility that tends to equalize rates of return on capital advanced also leads to the establishment of stationary absolute prices. I know of no evidence that this is the case, nor of any simulation that shows it to be generally true, nor even of any theoretical argument that supports it.4

IV. The TSS Interpretation

The TSS interpretation of Marx's value theory has been “discovered” numerous times by theorists working independently of one another.5 It differs from the standard interpretation in two seemingly minor but crucial ways. According to the standard interpretation, Marx's values and prices are two separate and timelessly determined “systems.” According to the TSS interpretation, they are determined within historical time, and interdependently: output prices depend on the “value” rate of profit (surplus-value divided by the value of capital advanced), while the value of the capital advanced depends on the prices, not values, of means of production and subsistence.

This re-interpretation refutes all the allegations of logical inconsistency in the "quantitative" dimension of Marx's value theory. Total price and profit equal total value and surplus-value, the aggregate "value" and "price" rates of profit are equal, values cannot be negative and profits can be positive only if surplus-value is positive, the rate of profit in luxury industries affects the general rate and, what is most relevant to the present paper, labor-saving innovation itself can lead to a lower general (uniform or nonuniform) rate of profit (see Freeman and Carchedi, eds., 1996).

The TSS refutations of the Okishio theorem make use of the fact, emphasized above, that even if a uniform rate of profit is postulated, the level of the profit rate is not determined by physical coefficients alone; it depends also on the relation between input and output prices. Only when input and output prices happen to be equal to physical coefficients suffice to determine the level of the profit rate, otherwise one or another value theory is needed. The TSS refutations of the Okishio theorem employ Marx's value theory for this purpose.

Specifically, the rate of profit is computed in the following way. Both input and output prices are measured in labor-time per unit of output or, equivalently, in money per unit of output if the monetary expression of value is assumed to be constant over time. Input prices are taken as given (determined in the previous period or stipulated as initial conditions in the first period), and they, together with the means of production and subsistence advanced, determine the value of the constant (C) and variable (V) capital advanced. New value added equals the amount of living labor (L) extracted in production (or its monetary expression, assuming the monetary expression of value is constant). Surplus-value (S) equals L - V, and the general profit rate equals S/(C+V).

This is a temporal profit rate because the input prices used to compute C and V need not equal the subsequent output prices, and because the general rate is fully determined as a result of the production process, before outputs are sold. It is a single-system profit rate because C and V depend on the prices, not the values, of means of production and subsistence. If the profit rate is assumed to be uniform, then the aggregate output prices of each sector, in the absence of fixed capital, are determined by marking up costs in accordance with S/(C+V). By dividing the aggregate output prices by the gross outputs of the various sectors, the unit output prices are obtained, and they become the input prices of the next period.

V. Refuting the Okishio Theorem

Note that no premise of the Okishio theorem precludes the employment of Marx's value theory for the purpose of determining prices or the profit rate. Indeed, if the theorem is to be an internal critique of the logic of Marx's LTFPR, as it is meant to be, and not merely a conflicting theory of the profit rate based on an alien value theory, it cannot preclude the employment of Marx's value theory in this context. Note, moreover, that if one is to determine whether the Okishio theorem is true, i.e., determine whether post-innovation input and output prices will necessarily become equalized and therefore whether r* will necessarily become the economy's actual uniform post-innovation profit rate, the employment of some value theory is simply unavoidable. As has been stressed above, physical data and a uniform profitability condition are insufficient to determine either prices or the rate of profit unless input and output prices are postulated a priori to be equal. To invoke such a postulate here would be to assume away the very problem under investigation.

Marx's value theory, as interpreted above, does imply that post-innovation prices reach a stationary state and therefore that the actual uniform profit rate converges on r* in the special case in which the labor-saving innovation is one-time-only. Thereafter, physical coefficients remain unchanged throughout all time. As is well known, if the profit rate is always uniform and physical coefficients remain constant, prices will converge to a stationary state.

What happens, however, if the innovation is followed by subsequent innovations before prices have time to approach the stationary state? Because labor-saving innovation reduces commodities' prices (measured in labor-time or in money prices that express constant quanta of value), continuous labor-saving innovation leads to continuous reductions in prices (on average).

And if prices are continually falling, output prices are always lower than input prices. This implies that the general rate of profit will be lower than r*, and it is thus possible for labor-saving technical changes to lower the profit rate, even if uniform profitability is assumed. All of this is possible, moreover, without violating any premise of the Okishio theorem. A simple example will illustrate this. Assume a two-sector economy with the following as the initial techniques:

6 t. iron + 24 hrs. living labor -> 30 qr. wheat

44 t. iron + 11 hrs. living labor -> 55 t. iron

These assumptions satisfy premises (i)-(iii). Premise (iv) is satisfied by assuming that the real wage per unit of living labor is a constant 0.2893 qrs. of wheat. Initial input prices of 2.3026 and 0.7829 for iron and wheat, respectively, ensure that, initially, absolute prices are stationary and profit rates are equal, satisfying premises (v) and (vi).

Now imagine that the output of both wheat and iron, and the input of iron into the production of each goods, all increase by 10% per period, and that the amount of living labor extracted increases by 1.2% per period in both sectors.

Because the new techniques of each period thus use no more iron, and less living labor, per unit of output, they are cost-reducing at current prices, thus satisfying premise (vii). Finally, assume that the profit rates of the two sectors are continually equalized, which satisfies the last remaining premise, premise (viii). Results are reported in Table 1. We see that the relative price of iron-to-wheat, Pit/Pwt, does converge to a stationary level, 4.00, and that the time path of the relative price converges on the time path of the hypothetical relative price, Pi*/Pw*. The latter is the relative price which would exist were absolute input and output prices equal. Yet the actual input and output prices do not converge to a stationary state, but continually decline, and the ratio of the output price to the input price converges to $0.920 < 1$ in both cases. Because the output prices are lower than the input prices, the actual profit rate, S/(C+V), is lower than the hypothetical r* and, whereas r* rises monotonically from 22% to 25%, the actual profit rate falls monotonically from 22% to 15%.6 Since all of the premises of the Okishio theorem were satisfied, while the conclusion that the post-innovation profit rate cannot be lower than the initial rate was negated, the Okishio theorem has been refuted. It is easy to come up with a multiplicity of similar counter-demonstrations, by varying the assumptions concerning the precise nature of the technical changes, the number of sectors, fixed capital, the size of the real wage, and so forth, in numerous ways. To

refute the Okishio theorem, in other words, no particular model of technical change and accumulation is required. What is necessary is that the technical changes be labor-saving, that prices (measured in labor-time) fall when the amount of labor needed to produce the commodities falls, and that the innovations occur in rapid enough succession that convergence of prices towards a stationary state does not occur.

Table 1

t	P_{it}/P_{wt}	P_i^*/P_w	P_{it}	P_{wt}	P_{it+1}/P_{it}	P_{wt+1}/P_{wt}	S/(C+V)	r*
0	2.94	2.94	2.3026	.7829	1.000	1.000	22.0%	22.0%
1	2.94	3.02	2.3026	.7829	.985	.964	20.3	22.3
2	3.00	3.10	2.2670	.7548	.974	.950	19.3	22.6
3	3.07	3.17	2.2082	.7175	.966	.944	18.6	22.8
4	3.15	3.24	2.1336	.6772	.960	.940	18.1	23.0
5	3.22	3.30	2.0484	.6364	.955	.937	17.6	23.2
10	3.49	3.53	1.5689	.4500	.940	.929	16.4	23.9
15	3.66	3.69	1.1305	.3087	.932	.926	15.9	24.3
20	3.78	3.80	.7884	.2087	.928	.924	15.6	24.6
30	3.90	3.91	.3642	.0933	.924	.922	15.3	24.8
40	3.96	3.96	.1626	.0411	.922	.921	15.1	24.9
60	3.99	3.99	.0312	.0078	.920	.920	15.0	25.0
80	4.00	4.00	.0059	.0015	.920	.920	15.0	25.0

Note: Pi*/Pw* is the hypothetical iron-to-wheat price ratio that would exist were input and output prices equal.

In describing techniques, the preceding demonstration deals only with sectoral aggregates. It makes no assumptions concerning the techniques employed by the individual firms within each sector. It is therefore consistent with the demonstration to assume that it deals with the case in which there is only a single firm in each sector or, equivalently, with the case in which all firms in the sector employ the same techniques. Let us now assume this. What, then, does the demonstration reveal?

Because this is an example *without* fixed capital, if all firms in a sector employ the same technique, they all employ the most up-to-date, state-of-the-art technique. They begin from scratch each new period. Hence, no firm is technologically backward, or technologically advanced, relative to the others in the industry. This is true not only of existing firms, but of new entrants. Any new entrant into either sector in any period employs the exact same techniques as the existing firms, since better techniques are not yet available.

Therefore super-profit (surplus profit) does not exist here. That is, no firm, even new entrants, can obtain a higher rate of return than the average by having produced at a lower cost per unit. They have all, including new entrants, produced at the exact same cost per unit and therefore they all, including new entrants, obtain the exact same rate of return as the others. Hence, the fall in the actual profit rate, despite a constant real wage and a continuing series of Okishio-viable technical changes, simply *cannot* be attributed to the existence of technologically backward firms. The actual rate of profit is not the rate of profit obtained by the technologically backward firms only. Nor does the existence of technologically backward firms lower the general rate of profit below the rate obtained by the technologically most advanced firms. These explanations are false for the simple reason that, in this example, *all* the firms in the industry are “most advanced.” Therefore the decline in the rate of profit pertains to them all. And therefore the decline in the rate of profit is a decline in the profit rate obtained by the technologically most up-to-date producer, employing the state-of-the-art technique.

There is no reason to believe, i.e., no textual evidence of which I am aware, that Marx's LTFPR refers to the tendency of the rate of profit received by the most advanced producers only. Rather, it refers to the tendency of the *general* rate of profit, the weighted average of all the profit rates throughout the economy. But even if one has the opposite interpretation, or for some reason wishes to restrict the examination of the tendency of the profit rate to the profit rate obtained by the most advanced producers only, the example above demonstrates conclusively that their rate of return on capital advanced can fall, even when they employ Okishio-viable techniques and the real wage rate is constant.

VI. A Post-Mortem

Although the Okishio theorem is false, the exercise does enable us to draw some valid conclusions concerning the impact of technical change on the profit rate. The mathematics does demonstrate that r*, the particular hypothetical uniform profit rate which would exist were prices to reach a stationary state after a viable technical innovation, cannot be lower than the initial hypothetical rate r. Moreover, were technical innovation a rare “perturbation” of an otherwise stationary state, and not an ongoing phenomenon, then the convergence property of the uniform profit rate equations implies that the actual profit rate, if continually equalized, would converge to r*.

These conclusions, though valid, suggest very little about how labor-saving technical change will affect the tendency of the general profit rate in actual capitalist economies. Nor do they challenge the logic of Marx's LTFPR in the least. Even a cursory reading of the law immediately discloses that it refers to the impact of a continuing series of technical changes), and that these technical changes are held to lead to a continuing series of reductions in commodities' prices (given a constant monetary expression of value) (Marx 1981, Ch. 13; see, especially, pp. 318-19 and 332-33).

It has recently been suggested in private correspondence that the TSS critiques have not refuted the Okishio theorem, since it was meant all along to apply only to the case of one-time-only technical change or, alternatively, that the theorem was meant all along to be restricted to the special case in which post-innovation input and output prices are equal.7 I do not find these suggestions plausible; apart from the TSS literature, discussions of the Okishio theorem do not even raise these issues. It seems doubtful, moreover, that the theorem would have gained the prominence it has, or that it would have been so widely regarded as refuting Marx's LTFPR, had it been interpreted as being so restricted in scope.

In any case, none of this has the slightest bearing on whether the theorem is true or false. All that matters is whether its conclusion follows necessarily from the explicitly stated premises of the theorem. In no existing version of the theorem is it stated explicitly that only a single new innovation is permitted, nor that the equality of input and output prices is a premise. The theorem, as stated in all existing versions, is therefore false.

This should be acknowledged, and the excessive claims that have been made concerning the import of the theorem should be retracted, in print. It may turn out that readers will then still find the theorem significant, and perhaps even still regarding it as a challenge to the logical coherence of Marx's LTFPR. That is for them to decide. They cannot make that decision, however, unless and until the record is corrected. As long as the record is not corrected, moreover, those who seek to build upon Marx's own presentation of the LTFPR and to analyze current realities on its basis, will wrongly continue to be regarded as ignorant and as dogmatic apologists.

Unfortunately, nearly fifteen years have elapsed since the publication of the first TSS refutation of the theorem (Ernst 1982), and the record has yet to be corrected.

Notes

1. This interpretation, which will be discussed below, is also known as "sequential non-dualist." The term "temporal single-system" was first used in Skillman (1995). Recently, Ramos (1996) has also challenged the Okishio theorem from a TSS perspective, focusing on the problem of changes in the money/labor-time relation brought about by technical change.

2. Roemer (1981) generalized Okishio's theorem to include fixed capital. For simplicity, I will abstract from fixed capital below, although the ensuing discussion applies equally to the fixed capital version of the theorem. The refutations of the theorem by Kliman (1988, 1996) and Freeman (1996) apply to both the circulating capital and fixed capital cases.

3. Apparently the rationale for this restriction is a passage in Capital III, in which Marx discusses why a profit-maximizing capitalist would voluntarily adopt innovations that lower the general profit rate, i.e., precisely the argument that the Okishio theorem re-examines. Marx (1981:373-74) argues that the innovating capitalist at first reaps superprofits (and thus raises his/her own profit rate), but that "competition makes the new procedure universal and subjects it to the general law [of value]. A fall in the profit rate then ensues - firstly perhaps in this sphere of production, and subsequently equalized with the rest - a fall that is completely independent of the capitalists' will." Given that the theorem is intended as a disproof of Marx's LTFPR, and not a claim concerning actual economies, it is reasonable for its scope to be restricted to the case of uniform profitability. Marx's reference here to the equalization of the rate of profit, however, is best understood as a reference to a tendency, not a static outcome.

4. The simulation models that investigate the dynamic stability of the Sraffian model do not address this issue at all, since they work with relative prices only. To guarantee that prices will be stationary throughout all time, neoclassical intertemporal equilibrium models need to assume not only perfect mobility of capital, but also perfect knowledge of the future, perfect futures' markets for all commodities, and no time preferences. Such postulates are of course absent from Marx's LTFPR and from all versions of the Okishio theorem.

5. In addition to the TSS works already cited, see, for instance, Giussani (1991-92), Maldonado Filho (1995), and the contributions by Carchedi, de Haan, Freeman, and McGlone and Kliman in Freeman and Carchedi, eds. (1996).

6. The importance of the systematic divergence between these two profit rates, and the concomitant failure of the actual input and output prices to converge, cannot be overemphasized. It is commonly believed that the value, price, and profit magnitudes of the TSS interpretation differ from those derived from simultaneous equation models only during a "disequilibrium" dynamic adjustment process, so that the "true" magnitudes are those of the simultaneous equation models, which act as "centers of gravity" to which the actual magnitudes converge or around which they fluctuate. Results such as those above show the utter falsity of this belief.

7. These views have been put forward on the Outline of Political Economy List (OPE-L), a closed e-mail discussion list.

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EFFECTIVE DEMAND AND THE MARKET PRICE OF PRODUCTION

David L. Kristjanson

A. Introduction

Marxian theory has been held back by its failure to integrate its theory of prices with its theory of crises. In spite of orthodox Marxian attempts to theorize price dynamics, Marxian price theory remains a long-run theory of prices in which demand plays a decidedly secondary role. The orthodox interpretation thus stands in stark contrast to Marx's theories of crises in which short run changes in demand play a central role in the onset of crises. By reexamining the role of demand in the determination of value, it is possible to produce value categories which provide the basis for a theory of market adjustment processes. It then becomes possible to ask under what conditions will changes in demand lead to self-correcting changes in prices, and under what conditions will crises be provoked. Rethinking demand thus constitute an crucial step towards the integration of Marxian theories of crisis and price theory. In so doing, value theory can be restored to its central place in the critique of political economy.

The importance of this development should not be underestimated. The great merit of value theory is that it provides a consistent and rigorous framework for understanding how capitalist enterprises command and redistribute the available labour in a given economy. The process of competition among capitals has important implications for how society's labour gets distributed. By integrating demand into a Marxian theory of prices, it becomes possible to show the implication of changes in demand on how that labour-time is distributed, both among competing industries as well as inter-temporally between periods. The analysis provides a value theoretic framework for analysing the distribution of social labour under conditions of excess or insufficient demand. The task in this chapter is to lay the foundation for a dynamic theory of market processes by showing how demand can be consistently integrated in to a Marxian theory of value.

Two distinct tasks present themselves. The first concerns a consistent explanation of Marx's argument concerning how demand affects the determination of value. The challenge is to show how the non-dualist interpretation of value permits a meaningful role for demand while preserving the idea that it is the expenditure of labour in production which creates value. Marx introduces demand by examining the determination of market value -an analysis which abstracts from competition among industries and focusses on how competition among producers within an industry using different techniques of production leads to the formation of a single market value. The first step is to show how demand affects the determination of market-value.

The second step is to apply this argument to the determination of prices of production in order to show how value is affected by demand under condition of inter-industry competition. I will argue that introducing demand requires us to relax the assumption of market clearing which underlies the formation of prices of production. As a result the value category undergoes a further development and value takes the form of the market price of production. It is the development of this new form of value that permits the value theoretic analysis of market adjustment processes.

Implicit in this interpretation of the role of demand ins the idea that at each level of abstraction, at each stage of the analysis, new contingencies are introduced into the theory. These new contingencies require a re-evaluation of the meanings of the key theoretic term – value. The result of this re-evaluation is a change in the form that value takes at each stage of the analysis. I contend that an appreciation of the evolution of the form of value – from value to market value to price of production to market price of production – is vital to a consistent interpretation of Marxian value theory. Only in this way is it possible to provide a satisfactory integration of demand. Before addressing the two questions I have laid out, it will be helpful to examine briefly an argument concerning the evolution of the forms of value which allows for a consistent interpretation of the meaning of "abstract socially necessary labour-time" and which provides a meaningful role for demand in the determination of value.

B. Demand and the Determination of Value

In the previous section, I argued that by incorporating demand directly into the determination of value, a more consistent interpretation of the meaning of "socially necessary abstract labour-time" results. This interpretation incorporated both senses in which labour-time can be said to be "socially necessary" and thus provides a direct role for demand in the determination of value. However, Marx only hints at how value ought to be determined when market conditions are introduced into the analysis. The task of this section is therefore to show:

i) how value is determined under conditions of excess or insufficient demand;

ii) how the resulting form of value makes possible the analysis of market adjustment processes.

1. Demand and the Determination of Market Value

a. A Non-dualist Approach

In the previous chapter I argued that the orthodox interpretation of the determination of market value in Chapter 10 of Volume I of Capital failed to incorporate demand into the determination of market value. Instead, demand affected value only indirectly by changing the relationship between market price and market value (and, later, the price of production). As a result, the importance of the second meaning of socially necessary labour was overlooked and the orthodox interpretation missed the important ways in which changes in demand redistribute value among industries and across periods. One consequence of this misrepresentation is a failure to make sense of Marx's own discussion of the determination of market value. The textual evidence can not be definitive. However, support for the present reading can be provided by showing how inconsistencies encountered by the orthodox interpretation are eliminated by recognizing a role for demand in the determination of value.

The problem presented in Chapter 10 is how to determine a commodity's value once the existence of a number of capitals operating with different techniques of production is introduced into the analysis. No inventory adjustments or product differentiation are considered (1959, p. 186). However, in contrast to neo-Classical and Sraffian theory, the analysis does not assume a single average or typical producer. The importance of this distinction has been overlooked in the literature and yet it is this characteristic of Marx's analysis which provides the basis for the theory of the market adjustment process. It is worthwhile, therefore to carefully consider how this element of the theory is developed.

Marx begins by identifying three groups of producers according to the labour requirements for the production of the commodity – those whose production conditions allow the individual value of their output to be lower that the average, those whose individual value is above average and those whose individual value is equal to the average for the industry (Rosdolski, 1988, p. 91). He then identifies two different constellations of producers in an industry depending upon the contribution of each group of producers to the total quantity of the use-values produced in the period. In the first constellation, the individual value of the producers in the median group is equal to the industry average and the contribution by the two extremes is equally divided above and below the mean. In the second, one of the extreme groups predominates such that the individual value of the median group is not equal to the average value. With this starting point, Marx then considers the possibilities for the determination of the market value of the commodity given variations in the level of effective demand for the commodity (Marx, 1959 p. 182-3).

Three distinct demand conditions are considered. In the first, demand is equal to supply at the average value for the industry as a whole. In the second, demand exceeds or falls short of supply at the average value but is equal to supply at a value which lies within the range determined by the least and most efficient producers. In the third, demand exceeds or falls short of supply at a value determined by one of the two extremes. The question the Marx sets out to answer is this: how is the market value determined in each of these three cases?

The first case is the one most widely recognized in the literature. Here the market value equals the average value for the industry as a whole. The market value will equal the individual value of the median group only if the weight of the two extremes is equally divided above and below the median group. However, it can never equal the individual value of one of the extreme groups of producers (1959, p. 183-4). In this case, demand is assumed to be just sufficient to absorb the existing supply of the commodity at a market value determined by the average but does not play a role in the determination of the market value (Rosdolski, 1988, p. 91). This case provides the basis for the orthodox claim that demand does not have a direct role in the determination of value.

The examination of the second case, however, reveals the error of the orthodox interpretation and shows that demand does directly affect the magnitude of market value. Here Marx ask how is the market value determined if demand exceeds or falls short of supply at the average value? To illustrate how demand affects the determination of market value in this case he takes the example of an industry in which the less efficient producers predominate. In this case, when demand and supply coincide, the market value lies above the individual value of the median group. It is not equal to the individual value of any of the three groups of producers due to the asymmetric constellation of producers in the industry. When demand deviates from supply, however, the market value can equal the individual value of one of the two extreme groups of producers. What is most revealing about this example is the fact that it is the relative strength of the shift in demand that determines whether the market value will equal the individual value of one of the extremes. In order for the market value to equal the individual value of the less efficient group of producers (the predominant group), the demand for the commodity at the average value need only slightly exceed supply. However, in order for the market value to equal to the individual value of the most efficient producers, supply must significantly exceed demand.

> If demand is only slightly greater than supply, the individual value of the unfavorably produced commodities regulates the market-price... Should demand be weaker than supply, the favorably situated part, whatever its size, makes room for itself forcibly by paring its price down to its individual value. The market-value cannot ever coincide with this individual value of the commodities produced under the most favourable conditions, except when supply far exceeds demand.(1959: 184-5)

This passage thus reveals what the orthodox interpretation fails to see: the relative strength of demand affects the determination of the market value directly by affecting the way that the contribution of the individual producers in the industry is counted. Reference to the market value does not imply determination by the industry average except in the special case in which demand and supply coincide at the average value. This special case is important because it allows us to analyze the distribution of abstract labor while abstracting from market dynamics. Specifically, it allows an analysis of how the equalization of the rates of profit across industries redistributes social labor within and across industries. However, in the general case it cannot be assumed that markets clear and as a result profit rates across industries will differ. Marx's analysis in this chapter provides a way to analyze how the market value is determined when the possibility of excess or insufficient demand is introduced and profit rate differ systematically across industries. What his analysis suggests is that the market value moves within the range determined by the conditions of production according to the strength of effective demand for the commodity in question. Both production conditions and market conditions are therefore necessary to determine the market value once the possibility of deviations of demand and supply is introduced into the theory. Marx thus provides a way to use value theory to analyze the process of adjustment of prices which occurs due to discrepancies between demand and supply.

This reading of the role of demand is further reinforced by the third case that Marx considers. At this point in the text Marx reintroduces the concept of use-value and asks how changes in demand affect the commodity's use-value and the use-value of the labour employed in the production of the commodity. In order to ask this question, it is necessary to move to the next level of the analysis, the level at which the relationship among competing industries is brought into the analysis. It can only then be asked whether the labour expended in the production of a given commodity is in proportion to the total demand for the commodity or whether relatively too much or too little of societies labour is devoted to the production of a given commodity (Horverak, 1988, p. 281). The magnitude of effective demand, or the quantity of a commodity required to satisfy some social want...

> ...is, however, of essential importance, as soon as the product of an entire branch of production is placed on one side, and the social need for it on the other. It then becomes necessary to consider the extent, i.e., the amount of this social want. (1959, p. 185)

Until this point in the text, the effective demand for the commodity has been assumed to be sufficient to absorb the supply at the market value “no matter which of the three aforementioned cases regulates this market value. This mass of commodities does not merely satisfy a need, but satisfies it to its full social extent” (Marx, 1959, p. 185). The existence of excess or insufficient demand creates a deviation of market price from market value, but not as the orthodox interpretation suggests, from the market value as determined by the average. Instead Marx makes explicit that there are two distinct deviations which occur.

> Should their quantity be smaller or greater, however, than the demand for them, there will be deviations of the market-price from the market-value. And the first deviation is that if the supply is too small, that market-value is always regulated by the commodities produced under the least favorable circumstances and, if the supply is too large, always by the commodities produced under the most favourable conditions; that therefore it is one of the extremes which determines the market-value, in spite of the fact that in accor dance with the mere proportion of the commodity masses produced under different conditions, a different result should obtain. If the difference between demand and the available quantity of the product is more consider able, the market-price will likewise be considerably above or below the market-value.(1959, p. 185-6)

The traditional interpretation of the relationship between market-value and market-price overlooks changes in the market-value that result from changes in demand. This oversight is unproblematic as long as only those cases in which demand and supply coincide are being considered. However, the impact of changes in demand on the determination of market-value becomes crucial for questions of involving dynamic price adjustments. Failure to incorporate demand has led to the interpretation of Marx's theory of prices as a long-run theory in which demand plays a secondary role. In order to analyze the dynamic adjustment of prices over time it was necessary to abandon the value categories and to make the argument with reference to market prices. As a result, orthodox price theory is unable to use value categories to analyze how changes in demand affect the distribution of value. The value categories can only be defined by assuming a correspondence between supply and demand. A value theoretic analysis of how demand redistributes labour-time within and across periods is lost.

The passages cited above have largely been dismissed because of their apparent contradiction with other aspects of Marx's value theory. In light of the present reading of the determination of market value, it is now possible to return to the orthodox objections to incorporating demand into the determination of value to show why these objections are not valid. It is also now possible to assess earlier attempts to theorize the role of demand to show why, in spite of the great merit of these efforts, they fail to provide an adequate explanation of how demand affects the determination of value.

b. A Critique of Previous Attempts to Integrate Demand

i. The Orthodox Approach

In Chapter 2, above, Rubin's arguments concerning why demand can have no direct role in the determination of value were examined. From the perspective of the present interpretation the shortcomings of this argument now can be identified. The two central elements of the argument concern, first, the inability to quantify the value of individual commodities due to the indeterminacy introduced by market conditions {For example, Foley (1982) and Bellofiore (1989) argue for an interpretation of Marx's theory of value as a macro theory of exploitation due to problems in quantifying the value of individual commodities}; second, the claim that since changes in demand affect the magnitude of value, labour-time no longer constitutes the sole source of value (Rubin 1973, p. 209; Shaikh 1981, p. 300). These claims follow from a misspecification of the relationship between demand and value. I argue that the present interpretation of the role of demand does not undermine a quantitative determination of value nor does it imply that demand is a source of value.

Many previous attempts to integrate demand into the determination of value did so by conflating market value and market price. If value is identified with price then the magnitude of value depends upon all those factors which affect the effective demand for the commodity and the conditions of production become entirely redundant to the determination of value. This position has been advocated by a number of writers inappropriately referred to as the “Rubin School” and is maintained by some theorists working within a non-dualist framework (see, for example, Carchedi, 1996 p. 174). Rubin himself, correctly rejects this approach as it undermines the basis for a value-theoretic account of price changes by reducing the analysis to a single dimension. Since money becomes the sole measure of value, the double structure of labour and money which is necessary to establish a theory of price adjustment processes is lost. {Roberts (1997) argues for the importance of maintaining two systems of accounting in order to maintain that labour is exploited. Here a similar argument can be made for maintaining two systems of accounting. Without labour values it cannot be established why a particular price should be set at one level rather than another nor can it be shown how deviations of prices from values affect the distribuiton of value through changes in the value of money.}

In the present analysis however, production conditions are essential to the determination of value. First, the determination of excess or insufficient demand cannot be made without first identifying the average labour-time required to produce the commodity. Demand is always determined to be in excess or insufficient relative to the average social labour expended in the production of the commodity: the first meaning of the term “socially necessary” is retained and so is the requirement for determining the average conditions of production. Second, the limit to the effect of demand in the determination of market value is set by the conditions of production in each industry. The range within which the market value can move in each industry is determined by the more or less efficient producers. Shifts in demand which exceed the limits imposed by the conditions of production produce deviations between value and price. The magnitude of the market value thus continues to depend upon the production conditions of all producers in each industry and it changes, as in the orthodox interpretation, with any change in those production conditions. All of Marx's analysis concerning the change in market value which result form changes in the conditions of production – the length and intensity of work, the ratio of constant to variable capital, turnover time – continue to be relevant to the determination of value. What the orthodox interpretation overlooks is the evaluation of the portion of the total social labour devoted to each commodity as to whether it is distributed in socially necessary amounts. If too much labour has been allocated towards the production of a particular commodity, then that labour is not socially necessary and counts as less than average labour. If not enough has been allocated then that labour is counted as more than average. Counting all labour as average labour only applies to the special case in which demand is assumed to be equal to the existing supply. In the general case, demand must be considered and therefore the quantity of socially necessary labour-time will not in general correspond to the total. The magnitude of the market value, however, remains a strictly quantifiable variable and thus Rubin's objection that the introduction of demand to the determination of value undermines the quantitative determination of value is not valid. The second objection, however, becomes immediately relevant – how is it that demand can affect the magnitude of market value but not create or destroy value? How, in other words, can the idea that labour is the sole source of value be reconciled with the idea that demand affects the magnitude of value? The answer is immediately obvious once the analysis is

placed in the context of many competing industries. While changes in demand affect the determination of the market value of an individual commodity, they need not affect the overall magnitude of value of all commodities. If demand is analyzed at the level of abstraction of a single industry, then the fact that the overall magnitude of value is unchanged remains obscured. The failure adequately to distinguish between the different stages of the analysis and to apply the conclusions concerning the affect of demand on the determination of value to the appropriate level of the analysis can be seen to be a major impediment to the consistent integration of demand.

In order to show why changes in demand do not affect the magnitude of value in the aggregate, two types of changes in demand need to be distinguished. A shift in demand shall refer to the redistribution of demand within a period which leaves the overall level of demand in that period unchanged. A change in demand shall refer to the case in which demand exceeds or falls short of supply in the aggregate. Shifts in demand themselves can be categorized in two ways. A weak shift in demand is one in which the market value moves within the range determined by the least and most efficient groups of producers in the industry and no price value deviation occurs. A strong shift in demand results in the determination of market value by one of the extreme producers and a deviation of market price from market value. With these distinctions in mind it can be seen that in the case of weak shifts in demand, the market values of individual commodities can be affected by changes in demand without affecting the total value circulating in the period. A increase in demand in one industry must be equally offset by a decrease in other industries such that the overall magnitude of value remains constant. This result holds regardless of the differences in productivity among producers within each industry because the change in demand affects the market value by the same amount in each industry regardless of the differences in conditions of production. {Some interpretations of the role of demand define the market value as being equal to the value of less or more efficient producers regardless of the magnitude of the shift in demand. This interpretation would obviously result in differences in the overall magnitude of value depending upon the characteristics of the individual industries affected by the demand shifts. See, for example, Guissani 1995, p. 192)}

In the case of strong shifts in demand there will be individual price-value deviations for some commodities in the system. These price value deviations need not necessarily cancel one another: for example a number of weak shifts in demand in industries with excess supply may be offset by a single strong shift in demand in an industry experiencing excess demand such that only one price value deviation occurs. The reduction in value in the industries with excess supply is not, in this case, offset by the increase in value in the industry experiencing excess demand since the increase in value in the latter case is limited to the individual value of the least efficient conditions of production. In this case the sum of values clearly appears to be affected by the change in demand.

The puzzle is solved, however, when one takes into account the affect of the price value deviation on the value of money. If the value of money is defined as the ration between the value produced in the period and the total prices in the period, then price value deviations which occur due to changes in demand will have the effect of reducing the value of money such that the total value in the period remains defined by the total labour expended in the period. The presence of strong shifts in demand does not therefor imply that shifts in demand affect the overall magnitude of value.

{In a similar way, changes in demand reflecting excess or insufficient demand in the aggregate, whether accompanied by weak or strong shifts in demand, have the affect of altering the ratio of total value and prices in the period and may effect a change in the value of money. In this case the total magnitude of value in one period may exceed or fall short of the magnitude of labour expended in the period. This does not however, imply that changes in demand create or destroy value. Any increase in demand in one period which is not offset by reductions in demand in a previous or following period will result in a change in the value of money such that the total value created cannot exceed or fall short of the total labour expended. Changes in demand may affect the total value realized in the period, but they cannot affect the magnitude of total value created overall. Value is instead redistributed inter-temporally through the vehicle of money. An analysis of the intertemporal distribution of value due to changes in demand lies beyond the scope of the present argument.}

The orthodox objections to the idea that demand directly affects the determination of a commodity's value result from a failure to interpret consistently Marx's comments on the determination of market value. Demand can be integrated into the determination of the value of individual commodities in a way which maintains the quantitative nature of the analysis and which preserves the idea that labour is the sole source of value.

ii. Previous Attempts to Integrate Demand

Previous attempts to integrate demand have identified the dual nature of socially necessary labour and applied the logic to correctly distinguish market value and market price. However, each has failed to apply the analysis consistently to produce a theory of price dynamics.

Rosdolski (1977) gives the earliest and clearest English language exposition of the role of demand. His treatment has the great merit of making clear the link between the use-value of a commodity and the second sense in which labour can be socially-necessary (p.89). Further, he explicitly recognizes the diachronic nature of the analysis of the forms of value and thus correctly concludes that Marx's treatment of the determination of market value applies to the determination of prices of production once the existence of a number of competing industries is brought in to the theory (p. 94-5). Unfortunately, Rosdolski restricts his analysis to the determination of market-value and thus fails to show how demand affects the determination of prices of production. The role of demand in redistributing labourtime among industries is thus absent from Rosdolski's treatment.

Indart (1990) and Horverak (1988) also give careful expositions of the effect of changes in demand on the determination of market value. Indart is careful to distinguish between the different stages of the theoretical development of the value forms and thus recognizes that the analysis applies to the determination of prices of production once the appropriate changes are made (p.728). However, Indart assumes that the determination of the value form by the least or more efficient technique of production can only apply to situations in which capital cannot freely flow between industries (p. 732; p. 734). He thus concludes that the effect of demand conditions is limited to cases involving ground rent and cannot be applied to short-run price adjustment processes.

Horverak, on the other hand, does attempt to show how competition in an industry leads to changes in prices and value in the short-run. However, while he consistently shows how demand affects the determination of market-value, in his example he reverts to the determination of market- value by the industry average and thus fails to show the effect of changes in demand on the price adjustment process (1988, p. 295). Because his example focusses on only one industry in isolation, it also fails to show how demand redistributes value among industries.

It remains therefore to show the effect of demand on the determination of value at the level of abstraction which takes into account the existence of inter-industry competition. In the following section, it is shown i) how shifts in demand affect the determination of the market price of production, ii) how this new value category provides a value theoretic analysis of market adjustment processes; and iii) how shifts in demand redistribute labour-time among competing industries.

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THE WAGE RATE AND THE PROFIT RATE IN THE PRICE OF PRODUCTION EQUATION: A NEW SOLUTION TO AN OLD PROBLEM

Jean-Guy Loranger, February 1997

Résumé

Le but de cet article est de démontrer que, même si la solution de Marx au problème de la transformation peut être modifiée, ses conclusions restent valables. La nouvelle solution qui est proposée est fondée sur la contrainte d'un taux de profit moyen commun aux deux espaces de valeur et un taux de salaire nominal qui est déterminé simultanément avec les prix. Notre solution diverge de celle de Duménil-Foley-Lipietz quant à l'hypothèse d'un taux de salaire nominal supposé ici endogène et déterminé par la concurrence sur le marché du travail. On ne suppose plus que le salaire est fixé par la valeur d'un panier de subsistance, même si tel est le cas dans l'espace de valeur-travail. Comme on peut le constater, cette solution diffère aussi nettement de celle de Morishima et des néo-ricardiens qui ont accepté le postulat de Samuelson quant à l'indépendance des deux espaces. Notre solution est une alternative à celle de Marx, car elle transforme tous les coûts et maintient les deux contraintes macro et un taux général de profit commun aux deux espaces de valeur.

Mots clés: Transformation, valeur, prix, plus value, profit, salaire, capital, travail, équilibre

Classification JEL: B-14, B-24, D-33, D-46, D-57, E-11, P-16.

Abstract

The aim of this paper is to demonstrate that, even if Marx's solution to the transformation problem can be modified, his basic conclusions remain valid. The proposed alternative solution which is presented here is based on the constraint of a common general profit rate in both spaces and a money wage level which will be determined simultaneously with prices. This solution diverges from the Duménil-Foley-Lipietz solution on the assumption of the money wage rate which is assumed here as an endogeneous variable. The money wage level is determined by competition on the labor market. It is no more assumed to be fixed by the value of a subsistence basket, although it is still the case in the labor space. This is also quite different from the Morishima or the neo-ricardian solution, who have accepted the samuelsonian postulate of independence between the two spaces. This solution is an alternative to the Marx solution because it fully transforms the cost of production and maintains the two macro constraints and a general profit rate between the monetary and the social spaces.

Key words: Transformation, value, price, surplus value, profit, wage, capital, labor, equilibrium

JEL classification: B-14, B-24, D-33, D-46, D-57, E-11, P-16.

Introduction[115]

The debate around the transformation problem is more than a century old and it continues to fuel passionate discussions among marxian and neo-ricardian economists and, to a lesser extent, mainstream economists, namely since Samuelson (1971) outlined the independence between the two value systems [116]. The latter views it as a good illustration of the redundancy of the old ricardian and marxian labor value theory while radical economists, who still believe in the validity of an alternative approach to marginal utility theory, periodically attempt to give an adequate answer to valid objections formulated against Marx's way of establishing the correspondence between labor values and prices. Moreover, the « new » solutions proposed by Duménil-Foley-Lipietz (1982) or by the neo-ricardians like Morishima (1973) do not offer an adequate answer to Samuelson's critique. Some radical economists pursue the debate either by looking for a monetary solution in a static framework (Wolff-Roberts-Callari, 1982), either by proposing a dynamic approach (Shaikh 1977, Naples 1989, Freeman 1995, Freeman and Carchedi 1995). As was pointed out accurately by L. Gill (1996, p.532) in quoting M. Desai ... "the debate does not seem to end and is viewed as a rare example of a problem which continues to produce new solutions or reformulation of old solutions in a new mathematical language.... [perhaps] there is more than a simple technical question." Indeed, since the turn of the century, neo-classical economists have attempted to demonstrate the irrelevance of Marx's theory of value.

Marx's solution to the transformation problem[117] is based on the hypothesis of the non-transformation of the cost of production (constant and variable costs). It is a simplifying assumption which allows him to concentrate on the distribution of the surplus value and the profit rate in the labor value space and the monetary space. His main interest was to show that, although the profit rate can be different from one sector to another in the value space, the monetary profit rate in a competitive world must be the same in all sectors. The reason why the profit rate varies from one sector to another in the value space is caused by the differences in organic composition of capital due to unequal development between industries. It is also because some sectors do not produce any surplus value, such as the circulation sphere, in particular, the financial sector. Marx was well aware that the non transformation of the production costs was a simplifying assumption and did not consider that his conclusion would be substantially changed if that assumption were modified[118].

His main conclusion is twofold: on a micro basis, prices differ from values -and this is why a labor value theory is relevant as an explanation- but on a macro basis, there are two macro constraints which ought to be satisfied if the principle of value conservation is to be preserved. The first constraint is that the sum of values must be equal to the sum of prices, i.e. the aggregate gross production must be equal in both monetary and abstract labor spaces. The second constraint is that the sum of profits must be equal to the sum of surplus values. Since the transformation problem is a static analysis similar to a general calculable equilibrium approach[119], the same amount of value must be preserved in both spaces when one chooses a general equivalent form for measuring prices. There is more than one way of choosing that price standard:

(i) Choose a level of expenditure common to both spaces and one macro constraint. This is the Marx solution with the hypothesis of no-cost transformation.

(ii) Choose a level of wage common to both spaces and one macro constraint. This is the Duménil-Foley-Lipietz solution (1980, 1982, 1982) of the money wage determined exogeneously and fixed to the nominal wage in the value space

(iii)Choose a level of **real wage** common to both spaces and one macro constraint. This is the Morishima solution (1973) of money wages determined simultaneously with prices. It is also the neo-ricardian solution based on Sraffa's composite commodity (1960) as a standard of value[120].

Only the Marx solution preserves the same general profit rate between the two spaces and satisfies the two macro constraints, although only one constraint is effective. The other two solutions generate a monetary profit rate which is not equal to the general profit rate in the abstract space. Worse still, the other two solutions cannot satisfy the two macro constraints so dear to Marx and his followers. This implies that, even if the macro constraint of value conservation is preserved, some monetary surplus value would be created or lost during the transformation process, an awkward situation, since the core of the labor theory of exploitation is to explain how the monetary surplus value is created in the value space. Samuelson's sharp criticism of Marx's theory of labor value would still remain valid since he pretends that there is no logical connection between the two spaces: the monetary values would be independent of the labor values and, hence, there is no point in having two value spaces to explain what is going on in the real world.

The aim of this paper is to demonstrate that, even if Marx's solution can be modified, his basic conclusions remain valid. It will be shown in particular by the three following points:

(i) Marx's solution requires the specification of one macro constraint despite that his results satisfy the two macro equalities and a common general profit rate. This conclusion is already well known in the literature, but needs to be restated since it is a very crucial point.

(ii) The Duménil-Foley-Lipietz solution requires one macro constraint and satisfies the two macro equalities if the value added is chosen, although the general profit rate is

[115] This article is a major revision of a first paper written on the new solution to the transformation problem which was published in the working paper 9625, Dept. of Economics, Uninersity of Montreal, under the title « The transformation problem: an alternative solution with an identical aggregate profit rate in the labor value space and the monetary space ». The revised solution presented here is more formal and general.

[116]For a review of this debate, see in particular Dostaler (1978), Beaud and Dostaler (1993), Eatwell, Milgate and Newman (1987-90), Gill (1996), Laibman (1973), Mandel and Freeman (1984), Samuelson (1971), Steedman (1981), Sweezy (1949). The authors who have contributed with new solutions to the debate are Dumenil (1980,1983), Freeman and Carchadi (1995), Foley (1982,1986), Lipietz (1982,1983), Morishima and Seton (1961), Morishima (1973), Naples (1989), Seton (1957), Shaikh (1977), Sraffa (1960), Wolff,Roberts and Callari (1982).

[117]See in particular Marx (1967) Book III, part 1 and 2.

[118]Marx (1967), in Book III, chapter 11, p. 165, says ... Since the price of production may differ from the value of a commodity, it follows that the cost- price of a commodity containing this price of production of another commodity may also stand above or below that portion of its total value derived from the value of the means of production consumed by it.... Our present analysis does not necessitate a closer examination of this point.

[119]The dynamic approach put forward by M. Naples (1989) is an interesting approach which sould be pursued. After all, even neoclassical economists have developed a dynamic general equilibrium approach; but I still consider that Marx's static equilibrium approach has to be addressed adequately in this debate.

[120]For a survey of the neo-ricardian debate, see Mandel and Freeman (1984) and Steedman (1981). Also, a good criticism of the neo-ricardian approach is found in Naples (1989) and Shaikh (1982).

different between the two spaces. The result is not valid anymore if the gross value is chosen as the macro constraint. The Morishima solution yields a similar result, even with the value added.

(iii) The new alternative solution which is presented here is based on the constraint of a common general profit rate in both spaces and a money wage level which will be determined simultaneously with prices and will produce results which satisfy the two macro constraints. This solution contradicts the neo-ricardian approach based on a composite commodity as a standard of value, since neo-ricardians argue that there exists a linear relation between profit and wage and, once one of them is specified, the other is automatically determined. Moreover, the average profit rate cannot be determined here in the monetary space only: it is equal to the general profit rate determined in the abstract value space**, and simultaneity excludes independence between the two spaces**.

Definition of a two sector economy

In order to illustrate the various solutions, a two sector economy will be chosen as an example. The value equations in the abstract space are written:

$$\theta_1 x_1 = c_1 + v_1 + pl_1$$
$$\theta_2 x_2 = c_2 + v_2 + pl_2.$$

It is assumed that the turnover of capital is unity for all types of capital c and v, that the exchange rate between one dollar and one unit of social labor is unity, that there exists different organic compositions of capital γ_i and exploitation rates e_i specific to each sector. Hence, the profit rate of each sector will be $r_i = e_i /(\gamma_i + 1)$, i=1,2. The unit value of commodity in each sector is θ_i while the output quantities are respectively x_1 and x_2. The gross value measured in abstract labor units is $\theta_i x_i$. Since Marx defines the exploitation rate as the ratio of unnecessary labor to necessary labor for the production of value added, let μ_i be the necessary labor time for one hour of labor and $(1-\mu_i)$ the unnecessary labor time. The relation between the wage rate and the exploitation rate in the labor value space is $\mu_i = (1+e_i)^{-1}$ .Assuming that sector I produces consumption goods, the real wage rate in the abstract space is μ_i /θ_1 , i=1,2 .

The equivalence of Marx's equations in the Leontief form is

$$q_1 x_1 = a_{11} q_1 x_1 + a_{21} q_2 x_1 + l_1 x_1$$
$$q_2 x_2 = a_{12} q_1 x_2 + a_{22} q_2 x_2 + l_2 x_2$$

The transposed matrix of coefficients $\{a_{ji}\}$ has the usual meaning, i.e. a_{ji} is the quantity of commodity j which is necessary for producing one unit of commodity i while the element l_i is the quantity of living labor neceesry for producing one unit of commodity i. The identification of each component is based on the definition of gross value made by the two components constant capital and value added:

$$c_1 = a_{11} q_1 x_1 + a_{21} q_2 x_1$$
$$c_2 = a_{12} q_1 x_2 + a_{22} q_2 x_2$$
$$v_1 + pl_1 = l_1 x_1$$
$$v_2 + pl_2 = l_2 x_2.$$

These last two equalities can be re-written as

$$v_1 + pl_1 = \mu_1 l_1 x_1 + (1-\mu_1) l_1 x_1 = (1 + e_1)^{-1} l_1 x_1 + e_1 (1 + e_1)^{-1} l_1 x_1$$
$$v_2 + pl_2 = \mu_2 l_2 x_2 + (1-\mu_2) l_2 x_2 = (1 + e_2)^{-1} l_2 x_2 + e_2 (1 + e_2)^{-1} l_2 x_2.$$

The price of production equations can be written in the monetary space according to the marxian notation

$$p_1 x_1 = c'_1 + v'_1 + \pi_1$$
$$p_2 x_2 = c'_2 + v'_2 + \pi_2$$

When transcripted into the Leontief notation, these equations are

$$p_1 x_1 = (1+r)(a_{11} p_1 x_1 + a_{21} p_2 x_1 + w_1 l_1 x_1)$$
$$p_2 x_2 = (1+r)(a_{12} p_1 x_2 + a_{22} p_2 x_2 + w_2 l_2 x_2)$$

The term by term identification is

$$c'_1 = a_{11} p_1 x_1 + a_{21} p_2 x_1$$
$$c'_2 = a_{12} p_1 x_2 + a_{22} p_2 x_2$$
$$v'_1 = w_1 l_1 x_1$$
$$v'_2 = w_2 l_2 x_2$$
$$\pi_1 = r(a_{11} p_1 x_1 + a_{21} p_2 x_1 + w_1 l_1 x_1)$$
$$\pi_2 = r(a_{12} p_1 x_2 + a_{22} p_2 x_2 + w_2 l_2 x_2).$$

Marx's solution

Marx's solution is based on the hypothesis of the non transformation of costs and on the macro constraint that the gross value in the social space must equal the gross value in the monetary space. Translating these hypotheses in the mathematical model, the implication is:

$$c_1 = c'_1 , \quad v_1 = v'_1$$
$$c_2 = c'_2 , v_2 = v'_2$$
$$p_1 x_1 + p_2 x_2 = q_1 x_1 + q_2 x_2$$

It is immediately observed that Marx's second macro constraint, -the sum of profits is equal to the sum of surplus values- is already implied by the previous constraints. Indeed,

$$c'_1 + v'_1 + p_1 + c'_2 + v'_2 + p_2 = c_1 + v_1 + pl_1 + c_2 + v_2 + pl_2.$$

Hence,

$$p_1 + p_2 = pl_1 + pl_2.$$

Therefore, Marx's solution does not imply two independent macro constraints, but only one. In that respect, his solution is not different from the other "algebraic" solutions proposed by neo-ricardians, Morishima or by Duménil-Foley-Lipietz.What is interesting, however, is that Marx's particular choice of assumption, -the non- transformation of costs- yields two remarkable results:

(i) the sum of profits equals the sum of surplus values;

(ii) the general or average rate of profit is the same in both spaces, although it is different on a sectoral basis in the social labor space.

This last result is easily deducted from the definition of the general profit rate in both spaces:

value space	monetary space
$r = S\, pl_i / S(c_i + v_i)$	$r' = S\, p_i / S(c'_i + v'_i)$

Since, by hypothesis, $S(c_i + v_i) = S(c'_i + v'_i)$ and, by deduction, $Spl_i = Sp_i$, it follows that r = r'.

The monetary value table associated to Marx's solution is easily calculated after solving a system of three simultaneous equations:

(1) $p_1x_1 = (1 + r)(c_1 + v_1) = (1 + r)b_1$

(2) $p_2x_2 = (1 + r)(c_2 + v_2) = (1 + r)b_2$

(3) $p_1x_1 + p_2x_2 = q_1x_1 + q_2x_2 = a$

where b_i and a are constant terms the value of which are determined in the abstract space. the only endogeneous variables are p_1 , p_2 and r. The solution is

$$p_1 = (a/x_1)(1 - b_2/(b_1 + b_2))$$
$$p_2 = (a/x_2)(b_2/(b_1 + b_2))$$
$$r = (a-(b_1 + b_2))/(b_1 + b_2).$$

The other algebraic solutions

The rejection of the non transformation of costs assumption was judged by some marxists as a betrayal of Marx's insistence on the principle of conservation of value and that no monetary surplus value can be created or destroyed in the transformation process as long as it is analysed in a static framework. The demonstration that the simultaneous solution put forward by the general equilibrium approach would require only one macro constraint did not please at all Marx's disciples since it lead to the rejection of one important constraint. For instance, if the Duménil-Foley-Lipietz solution is calculated by standardizing with respect to the gross value instead of the value added, the sum of profits is no more equal to the sum of surplus values and their solution is not qualitatively different from Morishima's solution or from other neo-ricardian solutions. We can easily show that by choosing the value added constraint, the non- transformation of one component will impose equality on the other component between the two spaces. Indeed, the definition of value added is

abstract space	monetary space
$va = v_1 + pl_1 + v_2 + pl_2$	$va = v'_1 + p_1 + v'_2 + p_2$

The non transformation of variable capital implies $v_1 = v'_1$ and $v_2 = v'_2$. Hence, $pl_1 + pl_2 = p_1 + p_2$. In the Leontief form, these macro constraints are written as

$$va = l_1x_1 + l_2x_2 = w_1l_1x_1 + p_1 + w_2l_2x_2 + p_2.$$

Hence,

$$l_1x_1 - w_1l_1x_1 + l_2x_2 - w_2l_2x_2 = p_1 + p_2.$$

Since $m_i = w_i$ by assumption,

$$(1-m_1)l_1x_1 + (1-m_2)l_2x_2 = p_1 + p_2$$

or

$$pl_1 + pl_2 = p_1 + p_2.$$

Therefore, the assumption of equality of value added between the two spaces is identical to the assumption of equality between the sum of surplus values and the sum of profits. It follows that if the gross value is chosen as the macro constraint between the two spaces, the sum of surplus values is not equal anymore to the sum of profits. Indeed,

abstract space	monetary space
$gv = c_1+v_1+pl_1+c_2+v_2+pl_2$	$gv = c'_1+v'_1+p_1+c'_2+v'_2+p_2$

Assuming that $v_1 = v'_1$ and $v_2 = v'_2$, the macro constraint is reduced to

$$c_1 + c_2 + pl_1 + pl_2 = c'_1 + c'_2 + p_1 + p_2.$$

Unless (c_1+c_2) is assumed equal to $(c'_1+c'_2)$, (pl_1+pl_2) will be different from (p_1+p_2). It necessarily follows that the measurement of the average monetary profit rate will diverge from the general profit rate calculated in the social space, because both the numerator and the denominator of the money profit rate will be different from those already established in the social space. But what would be the effect of imposing the same general profit rate on the now familiar algebraic solutions? This will be the topic of the next section.

The general profit rate constraint

Let usassume the Duménil-Foley-Lipietz solution with the macro constraint of equalizing the gross value between the two spaces. The price equations are

$$p_1 x_1 = (1+r)(a_{11} p_1 x_1 + a_{21} p_2 x_1 + w_1 l_1 x_1)$$
$$p_2 x_2 = (1+r)(a_{12} p_1 x_2 + a_{22} p_2 x_2 + w_2 l_2 x_2)$$
$$p_1x_1 + p_2x_2 = \theta_1x_1 + \theta_2x_2 = a.$$

Since by hypothesis $w_1 = \mu_1$ and $w_2 = \mu_2$, these equations can be rewritten as

$$p_1 = (1+r)(a_{11} p_1 + a_{21} p_2 + \mu_1 l_1)$$
$$p_2 = (1+r)(a_{12} p_1 + a_{22} p_2 + \mu_2 l_2)$$
$$p_1x_1 + p_2x_2 = a.$$

The endogeneous variables are p_1 , p_2 and r. The solution is obtained by solving a non linear system of second degree equations with respect to one of the p and then find the corresponding value for r.

If the equality of the general or average profit rate is imposed between the two spaces, r becomes exogeneous in the solution and the macro constraint of the equality of gross value between the two spaces is redundant. Indeed, the price equations becomes a two linear equation system which can be solved easily with respect to the two unknown prices. However, this solution is of no interest since none of Marx's macro constraints are satisfied.

Obviously, it is necessary to modify the assumption of an exogeneous wage rate if one wishes to re-establish the relevance of Marx's macro constraints with the hypothesis of a common general profit rate to the two spaces. Hence, it will be assumed here that the wage rate in the monetary space is determined by competition as any other price and that it can be different from its value determined in the abstract space. Incidentaly, it is assumed here, contrary to the neo-ricardian and marxist current of thought, that the wage rate is not fixed in the monetary space by a subsistence basket equivalent to the real wage, although such an hypothesis is currently admitted by Marx and a number of other people in the social labor space.. One can find many quotations in Capital which can support this viewpoint. Take for instance the excerpt of Book III, as quoted by A. Freeman (1995,p.60):

> « The 20v can similarly diverge from this value, if the spending of wages on consumption involves commodities whose prices of production are different from their values. The worker must work for a greater or lesser amount of time in order to buy back these commodities (to replace them) and must therefore *perform more or less necessary labour* than would be needed if the price of production of their necessary means of subsistence did coincide with their values » (underlined by Freeman).

One now needs to specify a non homogeneous system of three equations. The first two equations will be the price equations and the last will be the equality of the gross value between the two spaces. We do not need to specify the other macro constraint because it is already implicitly contained in the equality of the general profit rate between the two spaces. Indeed,

abstract space		monetary space
$r = Spl_i/S(q_ix_i - pl_i)$	=	$r' = Sp_i/S(p_ix_i-p_i)$
$1/r = Sq_ix_i/Spl_i$	=	$1/r' = Sp_ix_i/Sp_i$

If, by hypothesis, $Sq_ix_i = Sp_ix_i$, then $Spl_i = Sp_i$. Therefore, the general profit rate constraint, combined with one of the two macro constraints, gives an analogous result to Marx's no cost transformation assumption. A unique monetary wage rate can be assumed for both sectors or a differenciated wage rate can also be assumed provided that one of the two wage rates can be fixed exogeneous and equal to the subsistence wage of the social or abstract value of its sector. After all, if there are only three equations, a unique solution requires only three unknown variables. If an n equation system is specified, one could either assume a homogeneous labor force and determine endogeneously a unique monetary wage rate, or assume a homogeneous work force in (n-1) sectors, determine endogeneously the corresponding monetary wage rate and fix exogeneously the wage rate in the other sector equal to the wage rate already determined in the social labor space for that sector, or any other combination, such as an (n-k) sectors of homogeneous labor force the unique monetary wage rate of which would be determined endogeneously with the other prices and, in the k other sectors, the monetary wage rate would be fixed exogeneously equal to the wage rates already calculated in the social labor space. This new approach is a major change with respect to the Duménil-Foley-Lipietz solution where it is asummed that it is the wage rate instead of the profit rate which is determined simultaneously with the production prices. The improvment is also felt in terms of calculus, since a linear solution is obtained instead of a non linear one, as simple as the one that was already found with the Marx solution. Hence, the new system is written as

$$p_1 x_1 = d(a_{11} p_1 x_1 + a_{21} p_2 x_1 + w_1 l_1 x_1)$$
$$p_2 x_2 = d(a_{12} p_1 x_2 + a_{22} p_2 x_2 + w_2 l_2 x_2)$$
$$p_1x_1 + p_2x_2 = a.$$

Let us assume here that the labor force is heterogeneous and, consequently, the wage rate in the first sector is fixed to $w_1 = \mu_1$ and, in the second sector, it is determined endogeneously with the other prices. Then, the system is written as

$$p_1 x_1 = d(a_{11} p_1 x_1 + a_{21} p_2 x_1 + \mu_1 l_1 x_1)$$
$$p_2 x_2 = d(a_{12} p_1 x_2 + a_{22} p_2 x_2 + w_2 l_2 x_2)$$
$$p_1x_1 + p_2x_2 = a.$$

The endogeneous variables are p_1 , p_2 et w_2 , while the other variables $d = (1+r)$, μ_1 and a are exogeneous and fixed equal to their values already found in the social labor space.

A numerical exemple

In order to illustrate the application of this new solution, a case already elaborated in another article will be used (Loranger, 1996). Tables 1 and 2 contain basic information of a two sector economy, where the measurement unit is one hour of social or abstract labor.

Table 1

sector	constant capital c	variable capital v	surplus value pl	total qX
I	3 240	2160	1 080	6 480
II	2 760	1380	2 070	6 210
Total	6 000	3540	3 150	12 690

It is assumed that the turnover of capital is unity for all types of capital, that the exchange rate between one dollar and one unit of social labor is unity, that sector I produces 4000 units of consumption goods and sector II 2000 units of production goods. It is also assumed that output of sector II is chosen as an input for both sectors and that output of sector I is chosen as an input of that sector in the proportion of 1/5. By inspecting the figures contained in the table, the following results can easily be deducted.

Table 2

sector	quantity	unit value	exploit-ation rate	organic rate	profit rate[121]	wage rate
	x	q	e	g	r	m
I	4 000	1.62	0.5	1.5	0.20	.667
lI	2 000	3.105	1.5	2.0	0.50	.40

The values of the technical coefficients of matrix A' and of the labor force vector l are

$$A' = \begin{pmatrix} 0.20 & 0.1565 \\ 0.00 & 0.4348 \end{pmatrix} \qquad l = \begin{pmatrix} 0.81 \\ 1.725 \end{pmatrix}$$

The average profit rate is r = 3150/9540 = 0.3302 and the gross value of production is a = 12690. The system is now written as

(1) $p_1 = 1.3302(.20p_1 + .1565p_2 + (.81)0.667)$

(2) $p_2 = 1.3302(.4348p_2 + 1.725w_2)$

(3) $2p_1 + p_2 = 6.345.$[122]

After re-organizing terms, the system to be solved is

(1) $.7340p_1 - .2082p_2 = 0.7184$

(2) $.4216p_2 - 2.2946w_2 = 0$

(3) $2p_1 + p_2 = 6.345.$

The solution is

$p_1 = 1.773$; $p_2 = 2.80$; $w_2 = 0.514$

The corresponding table for the monetary values is[123]

[121] Since the turnover of capital is assumed equal to unity for all types of capital, r=e/(g+1).

[122] The macro constraint is $4000p_1 + 2000p_2 = 12690$. Dividing by 2000, one gets the previous equation.

[123] The detailed calculus for the various entries in the table are

$c'_1 = (.20(1.773) + .1565(2.80))4000 = 3172$

$c'_2 = (.4338(2.80))2000 = 2435$

Table 3

sector	constant capital	variable capital	profits	total
I	3172	2160	1760	7092
II	2435	1773	1390	5598
Total	5607	3933	3 150	12 690

It is verified that the sum of prices is equal to the sum of social values 12690 and that the sum of profits is equal to the sum of surplus values 3150. The general profit rate is the same in both spaces and equal to .3302. Money prices and wages differ from their values on a sectorial basis:

abstract value	monetary value
$q_1 = 1.796$	$p_1 = 1.667$
$q_2 = 2.754$	$p_2 = 3.012$
$m_1 = .667$	$w_1 = .667$
$m_2 = .40$	$w_2 = .514.$

Conclusion

The proposed new solution diverges from the Duménil-Foley-Lipietz solution on the hypothesis of the money wage rate which is assumed here as an endogeneous variable. The money wage level is determined by competition on the labor market. It is no more assumed to be fixed by the value of a subsistence basket of goods, although it may be so in the social labor space. If the labor force is assumed heterogeneous, one wage rate (which can be applied to many sectors) is determined endogeneously, while the other (or many others) is fixed exogeneously equal to the value already found in the abstract space. This result is in contradiction with the neo-ricardian approach which asumes that the monetary wage rate is fixed at the subsistence level and is a linear relation with the average profit rate. The real wage constraint in the Morishima solution is replaced by the average profit rate constraint simultaneously determined in the social labor space. This hypothesis is fundamental, since it imposes the interdependance between the two spaces, while the neo-ricardians assume Samuelson's hypothesis of independence between the two spaces and, therefore, argue only within the monetary space. This result is fully compatible with the Frobenius-Perron theorem which states that there is a unique profit rate associated with the dominant characteristic root of a matrix formed by all the technical coefficients of the system[124]. This solution is an alternative to the Marx solution because it fully transforms the cost of production and maintains the two macro constraints which link the two interdependent spaces. hence, Samuelson's devastating critique is ill founded!

$v'_1 = .81(.6667)4000 = 2160$

$v'_2 = 1.725(.514)2000 = 1773$

$\pi_1 = .3302(3172 + 2160) = 1760$

$\pi_2 = .3302(2435 + 1773) = 1390$

[124]This statement may appear ambiguous since the Frobenius root comes from a matrix usually constructed in the monetary space with a unique profit rate for all sectors. It can be shown that it is possible to construct a different matrix in the labor space which would include an exploitation rate in addition to the other technical coefficients. The average profit rate is then a weighted average of the sectorial profit rates.

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HOW CAPITAL RULES MONEY - MARX'S THEORY OF MONEY IN CAPITALISM

Claus Magno Germer

1. Introduction

This paper aims to outline the basic components of Marx's complete theory of money in capitalism, starting from the analysis of the derivation of money from labor until the forms in which it exists in the capitalist economy. The return to the theoretical development originally performed by Marx may be justified for two reasons. First, because Marxian monetary theory is insufficiently developped, given the small and fragmentary work performed by Marxist economists on the subject; second, for this reason there is a considerable influence of concepts imported from other theories, usually incompatible with Marxian theory. The consequence is the distortion or even the abandonment, often unexplicit or even unnoticed, of basic assumptions and categories of the Marxian system, damaging its internal coherence, which every theory intended to be solid and conceptually rigorous should preserve.

The studies focusing on Marx's views about money in capitalism are frequently based on an incomplete reading of that author's theory. In fact, the sources cover mainly the three openning chapters of Book I of *Capital*, supplemented by the *Contribution* published in 1858. The *Grundrisse*, where the theoretical foundations for the concepts of value and money are developed, and the chapters of *Capital* III which deal with money in capitalism, are not sufficiently explored. This has lead to misinterpretations of Marx's theory of money in two crucial points: the first refers to the question of the commodity form of money, demonstrated in *Grundrisse*; the second is the characterization of money and its functions in capitalism, made in Book III of *Capital*. The precise understanding of Marx's theory of *money in capitalism* cannot be obtained if based only on Book I of *Capital*. It is also necessary to previously determine the nature of the difference between money and capital, a subject extensively discussed by Marx in *Grundrisse* but only very shortly mentioned in Book I of *Capital*[125].

The purpose of this paper is to provide support to the proposition that Marx's theory of *money in capitalism* should be understood as a system consisting of three fundamental parts: first, the theory of money as a category belonging to the sphere of circulation of commodities, not specifically to capitalism; second, the characteristics which distinguish capital, as a category belonging specifically to the capitalist economy, from money; third, the functions performed by money in capitalism, and the particular forms and laws under which it does so.

It will also be the attempted to substantiate the need to remedy an omission frequent in studies focusing Marx's theory of money. It is the failure to take into account the connections and differences between the concepts of money and capital and between money as a means of circulation and as monetary capital. Without accomplishing it, the understanding of the precise role of money within capitalism, according to Marx's system, becomes extremelly difficult. This omission seems to result from not taking into account the complete framework of Marx's theory about money, which should be seen

[125] Marx's works in English have not all been available to the author, except *Capital*. Thus, the quotations presented belong to the german editions, as indicated in the bibliography, translated by the author of this paper.

as a complex body consisting of three divisions, which have unduly been kept apart: first, the definition of money; second, the implications of the transformation of money into capital; third, money and credit money within capitalism.

2. Money: "material way of being of abstract wealth"

In Marx's view the theoretical categories of the economy represent economic relations among individuals in society, in production and circulation, or social relations of production, which often appear as objects or things. Accordingly, most of Marxist writers agree, more or less explicitly, that money and capital represent definite - and different - economic relations among individuals. However, often what is said has not been understood, according to Marx's profound statement: "although ignorant of this, yet he says it" (C, I, p. 51). In this way, in some writings the above mentioned acknowledgement looks more like the recognition of a formal principle than as having a clear content. In the case of money, stating that it expresses a determined social relation means that it is the material expression of an economic relation among private commodity producers. In other words, it represents a materialized social relation or a social relation converted into an object. The social relation expressed by money is the seller/buyer relation, which takes place in the sphere of circulation, among private and individual owners of commodities. This relation possesses a structural character derived from the dominance of private property of the means of production and the social division of labor within which the producers are placed. This means that, on one side, if money is there, so is the relation it represents; on the other side, when present, money represents only this relation. For example, money in itself does not represent the credit relation, hence it does not produce interest.

As the materialized seller/buyer relation, money is defined by Marx as a special commodity[126] which performs the function of general equivalent of value in the entire range of the commodity-producing society, i.e., af first within the strict range of the circulation of commodities, irradiating from there to the other spheres of society. The theoretical and historical development of money, as laid out by Marx, originates the following definitions. First, as a theoretical category, money is "the *material* way of being of *abstract* wealth" (Marx, 1980a, p. 188, emphasis in the original). The word "abstract", contrary to the understanding of some authors, is not a synonym to 'immaterial', but designates wealth or value *abstracted* from the particular use values (or common commodities) to which it is linked when produced. On the other hand, as a category of reality, money is "the commodity that functions as a measure of value, and, either in its own person or by a representative, as the medium of circulation" (C, I, p. 130), i.e., it is the commodity in which the functions of measure of value and medium of circulation are unified. Finally, gold is the actual commodity which corresponds to these concepts, therefore gold **is** money. Thus, within Marx's theory, money is strictly the material which is at the same time the measure of value and the means of circulation[127].

The emergence of money as such is preceded, on one side, by the appearence of several commodities as equivalents of value in limited ranges in the barter system. Although these do not perform as mediators of exchange, the determination of values of the commodities to be exchanged is made easier with their help; on the other side, by the appearance of primitive forms of exchange mediators, different from the equivalents although based on them. The money-form is complete when the function of equivalent is unified into one single commodity, which replaces all particular equivalents, and which additionally circulates systematically mediating the exchanges. This means that the functions of measure of value and means of circulation appear separately and precede the emergence of money. What is new in money is that these two functions are performed by one single commodity. This is why in Marx's exposition the section called 'money' comes after the exposition of those functions: they do not result from the constitution of money, but on the inverse. The functions of means of hoarding and of payment, and of world money, in contrast, can only be performed by money as such, i.e., by the commodity that has unified the two precedent functions. This is the qualitative development represented by the appearance of money. Thus, the functions of money, in Marx's view, have to be divided in two groups: the ones that precede and the ones that follow the emergence of money.

The fact that money has necessarily to be a commodity is not a matter of faith, but is based on strong theoretical foundations, laid out by Marx in the *Grundrisse*[128]. According to Marx's reasoning, the value of commodities cannot be directly represented in the particular labor time contained in each commodity, but only in abstract or average social labor, which however can only present itself indirectly, in the form of another commodity. In view of this reasoning, the contemporary versions, by Marxist authors, suggesting that the definition of money does not require its materiallity, have to be able to consistently disprove Marx's definition and to provide a convincing alternative as well, which has as yet not been done. The demonstration that money has to be a commodity has been done by Marx in two ways. On the one side, following the concrete historical process of emergence of money within the process of development of the merchant economy, and, on the other side, developing theoretically the nature of value and money. The later demonstration, though less known, is more important, because it at the same time demonstrates the inacceptability of stating the immaterial character of money *within Marx's theoretical framework*. It may be summarized as follows.

Marx's reasoning is based on the theoretical definition of the nature or essence of value and money. Value is the social link which connects the independent producers to one another, given private property and social division of labor. Its substance is abstract

[126] In his works Marx is explicit and consistent about money having to be a commodity. The following passages may be mentioned: "In contrast to commodities, which only simbolyze value as an independent reality, as general social labor, as abstract wealth, gold is the *material way of being of abstract wealth* (Marx, 1980a, p. 188, emphasis in the original); "... money is the *material medium* in which exchange values are submerged ..." (Marx, 1976a, p. 99, emphais added); "... first of all the commodity has to be exchanged for a universal *commodity* ..." (Ibidem, p. 100, emphasis added); "... money (the *material of the commodity* which performs as measure of value and consequently as money)" (Marx, 1976b, p. 21, emphasis added); "The *commodity* that functions as a measure of value, and, either on its own person or by a representative, as the medium of circulation, *is money*" (C, I, p. 130, emphases added); "The exchange value disconnected from the commodities themselves and itself existing at their side as a *commodity* is: *money*" (Marx, 1976a, p. 79, last emphasis in the original).

[127] It should be noted that, money having been defined as a special commodity converted into the general equivalent of value, it is incorrect to state that Marx's money theory is a theory of "commodity-money", since the term "money" already defines it as a commodity. On the other hand, there is no immaterial money in Marx's theory, only forms derived from money to perform some of its functions, like credit money for example, which is not money. It is correct however to designate the commodity that functions as money with the expression "money-commodity", which in capitalism is gold.

[128] (Marx, 1976a, p. 72-107). In his subsequent writings Marx did not go into the same level of detail about the subject, being therefore necessary to consult this work.

or social labor, i.e., social average of the universe of particularized labors, different from and opposed to them, though having its origin in them. Thus the magnitude of value expresses the abstract labor time contained in each single commodity. But how does abstract labor time express itself in an observable form, that is to say, under which material form does it show itself to the observer? To express or show itself means to state the amount of social labor contained in the commodity, and no form of money expresses value directly as labor time, but always as exchange value or price, represented by certain amount of the money-commodity. If gold is money, than the price of the commodity expresses itself in a certain amount of gold. Why not directly in labor time? Two aspects of this question have to be pointed out[129]. First, labor does not exist as an object, but only as an activity in the process of being performed. As soon as the process of production comes to an end, the performance of labor ends as well, and nothing of it is left except its product. In this way, labor time only exists materially, in an observable fashion, in the product of labor, and its amount can only be measured in the amount of the product[130].

Second, the amount of labor materialized in the use value of every commodity is individual labor, of a particular kind, therefore it does not directly express social labor. Thus, as products of particular labors, commodities differ from one another. Therefore, in order that one commodity be exchanged for the product of another particular labor, both have to be converted into substance common to both, i.e., into expressions of social or abstract labor. This will only be possible if both are able to be translated into one product of labor converted by the process of exchange into the expression of social labor in opposition to particular labors[131]. That commodity, which is money, does not only possess the materiality common to all products of labor, but is at the same time just a symbol in which all producers represent labor in its social dimension, because labor only exists materially in particular products, as forms of particular labors. No single commodity - not even the money-commodity - can manage to be the direct expression of social labor, except symbolically. Thus, the money-commodity is also a symbol of social labor, but a material symbol, i.e., it symbolizes in its matter (product of particular labor), a definite amount of social labor (see also Belluzzo, p. 83-4).

Moreover, the fact that commodities are exchanged at their values, which means through the equalization of the amount of abstract labor times, is not a "phenomenon of direct perception by individuals" (Weeks, p. 36), but is instead a subjective pressuposition of the process of exchange and becomes explicit only as a result of observation and reflection (Ibidem, p. 39).

Considering Marx's demonstration, Lipietz's objection does not look convincing, if I have well understood his arguments. The author attempts to demonstrate that credit money can be taken as "real money" ("vraie monnaie"). In the first place, Lipietz attributes the foundation of the defence made by many Marxists of money as a commodity to an argument of Marx which is not its true foundation: "gold is now money with reference to all other commodities only because it was previously, with reference to them, a simple commodity" (C, I, p. 70, quoted by Lipietz, p. 137). This argument merely states that gold is money because it had already been a commodity, but the crucial point that has to be proved, as above indicated, is why the abstract labor time, or value, contained in commodities *can only be expressed in the form of another commodity*. Second, Lipietz's demonstration about the relevance of credit money starts from the previous existence of money in the formula xM=yN (Ibidem, p. 138), whereas he should have shown how an immaterial kind of money could be introduced independently from the immediate exchange of commodities. This means that Lipietz did not offer an alternative solution to the problem of the measure of value, which is the original and irreplaceable function of money (=gold). Lipietz's theory seems to present two weaknesses as an attempt to correct Marx's theory. On the one hand, the demonstration that the functions of money as medium of circulation and means of payment may be performed by forms derived from money, like symbols of money and credit money, has been made by Marx in an apparently satisfactory way. Thus, in this respect Lipietz's demonstration seems not to provide a new solution. On the other hand, the estimate of the "labor-equivalent of money" ("équivalent-travail de la monnaie") and of the "value of labor power", provided by Lipietz (p. 35-37), assume the previous existence of a price structure, which means that it assumes the action of something performing as measure of value[132]. It should be noted that the "labor-equivalent of money", as long as it merely represents an estimate from the observer - i.e., a numéraire - does not solve the problem of how, in the real economy in motion, commodities manage to express their values in a money-form.

Foley's interpretation, on the other hand, clearly differs from Marx's demonstration about the character of money. He introduces a subtle change in Marx's basic argument, when he states that value "shows itself in the form of money, which is just value separated from *any particular commodity*" (Foley, p. 14, emphasis added), interpreting this as if Marx had stated that money could be something else than a commodity[133]. Foley apparently missed the fact that, according to Marx's reasoning, the *particular commodities* are opposed to the *general commodity* (Marx, 1976a, p. 100; 1980a, p. 127), which is the money-commodity, not to non-commodities (see footnote 1). Foley attributes an undeserved naivety to Marx's concept of money (=gold), attributing it to the mere influence of casual contemporary circumstances: "Marx, living in the nineteenth century when the gold standard was the dominant monetary form, assumes that the general equivalent must be a commodity produced, like gold, by human labor",

[129] Marx's exposition of this point in the *Grundrisse* is important and should be consulted (Marx, 1976a, p. 98-107).

[130] "Labor time itself only exists as such subjectively, in the form of activity" (Marx, 1976a, p. 102).

[131] "The need for a money different from labor time arises precisely from the need to express the amount of labor time not into its immediate and particular product, but into a mediate and universal product, into its particular product as equal and convertible into all the other products corresponding to the same labor time, corresponding to the labor time present not within one single commodity, but within all commodities simultaneously, hence within a particular commodity representing all others. Labor time itself cannot be immediately money (...) precisely because it exists in fact always only within particular products (as an object): as a universal object labor time can only exist symbollically, in this case *precisely within a particular commodity which is put as money*" (Marx, 1976a, p. 99, emphases added).

[132] On this point Lipietz's view seems to agree with Foley's (Foley, p. 14-15). According to Weeks "The money commodity provides a theory of the absolute price level with relative values given, and a theory that rejects the necessity of a money commodity must provide an alternative explanation of the price level ..." (Weeks, p. 104).

[133] This interpretation is apparent in Foley's statement that "the final step to the full money form of value is taken when some commodity *or some abstract unit of account* becomes socially accepted as the general equivalent and is commonly used as the measure of value of commodities" (Ibidem, p. 20, emphasis added).

adding that in the 20th century the monetary systems evolved into "a system in which the general equivalent is an abstract unit of account, like the 'dollar' " (Ibidem, p. 20). However, the dollar is merely a conventional unit of account, not a general equivalent or measure of value, for which it would have to be a commodity.

3. Capital: value as subject or money in process

Marx devoted great effort to stress as clearly as possible the fact that money and capital are essentially different categories, being nevertheless easily mistaken one for another in theory, which is one of the reasons of the difficulty for the correct understanding of the nature and dynamics of capitalism[134]. The differences between money and capital are extensively analysed in *Grundrisse* I (Marx, 1976a, p. 161-223), where the theoretical problems posed by the transformation of money into capital are carefully discussed. The subject is also focused, though more shortly, in the unpublished section of the *Contribution* (Marx, 1980a) and in the manuscripts of 1861-63 (Marx, 1976b, 1980b), and finally appears in a very succinct form in chapter 4 of *Capital* I. The original analysis has not only been reduced in this book, but its outline, as Marx pointed out, does not follow the same order as the investigation. In this sense the corresponding text in *Capital* I is rather an outline of the outcome than of the process of theoretical elaboration[135]. As our subject concerns more to the theoretical foundations of Marx's analysis, the reading of the *Grundrisse* and other writings previous to *Capital* is essential to the understanding of his theoretical concepts about the transition from money to capital.

As a relevant category of reality as well as of theory, capital also represents an economic relation among individuals within social production. Money in capitalism continues to express the seller/buyer relation, nothing else. Capital, however, expresses a new economic relation, which has its basis in the value relation, i.e., in money, but does not coincide with it. Capital expresses the relation between owners and not-owners os means of production, or owners of means of production and owners of labor power. As in the seller/buyer relation, whose structural character is based on private property and social division of labor, the structural character of the capital/labor relation is based on the legal separation, due to burgeois form of property, between the owner of labor power and the owner of the objective conditions of labor[136]. The individuals who confront each other within circulation now carry new economic functions, besides the ones of seller/buyer of ordinary commodities. The worker sells in order to buy, i.e., he sells labor power in order to buy means of subsistence, while the capitalist buys in order to sell, i.e., buys labor power (and other inputs) in order to sell commodities. The complexity of this relation arises precisely from the fact that it dominates and absorbs the value-relation, i.e., because capital dominates and absorbs money. This is the decisive theoretical distinction between money and capital in Marx's framework.

Money represents value as crystallized social labor, motionless in its material. Capital, on the other hand, expresses expanding value, i.e., social labor in expanding motion[137]. Value as money exists only ephemerally within circulation, for it vanishes at once into consumption, unable to preserve itself except as an anomaly when negating itself as a means of circulation, like in hoarding. Otherwise in the form of capital, where value preserves and expands itself, but under the condition that it circulates. Value as money vanishes in consumption as soon as it is converted into use values, while value as capital has to be converted into use values in order to preserve itself. Value as capital becomes the subject of the process as it moves restlessly, within circulation, from money into commodities and back into money, i.e., value as capital encompasses both its general and particular forms, money and commodities, and combines them into a dynamic unity. This means that the contradiction between value and use value intrinsic to the commodity, which in the money system[138] is transferred to the sphere of circulation, opposing money to ordinary commodities, is transferred to the sphere of production under capitalism. In this case labor power, one of the opposite poles of the contradiction, represents the use values as an aggregate, i.e., potential use value[139], in opposition to capital, which represents value in the aggregate, encompassing all expressions of value.

The distinction between money and capital becomes clearer when expressed in symbols:

"M" represents money (quantitatively determined or static value)

"M - C(MP+LP) ... P ... C' - M' " represents capital (value in continual motion of expansion)

One clearly sees that the emergence of capital does not extinguish money, but only absorbs it as one of its moments and forms of its cycle. In such subordinate position, in capitalism money keeps its original character and properties, but loses one part of its functions, which are performed by elements derived from capital, as will be shown in the next section. Thus, the development of the capital-relation does not affect the original determinations of money as general equivalent of value, measure of value and standard of prices. As autonomized value money is a presupposition of capital, not only in a historical sense but in its actual motion, since commodities as particular forms of value need to circulate in order to be converted into money as its independent and

[134] In view of the remarkable emphasis with which Marx analysed this distinction, it is surprising how small prominence it generally deserves in writings dealing with his theory of money.

[135] This circumstance is rightly mentioned by Harvey, when he points out the reason why Marx begins *Capital* by examining the commodity: "It was the result of extensive inquiry, a long voyage of discovery (...). We begin with what is in effect a conclusion" (Harvey, p. 1).

[136] The transition from money into capital as dominant forms of value within their respective circumstances - i.e., simple circulation and capitalism - reflects a deep and far-reaching historical process of change of social relations of production, described by Marx as primitive accumulation. This process constitutes the real presupposition of the emergence of capital.

[137] "Money (...) as capital lost its rigidity, and was transformed from a palpable object into a process" (Marx, 1976a, p. 187). "In simple circulation, C-M-C, the value of commodities attained at the most a form independent of their use-values, i.e., the form of money; but that same value now in the circulation M-C-M, or the circulation of capital, suddenly presents itself as an independent substance, endowed with a motion of its own (...)" (C, I, p. 154).

[138] *Money system* is an expression with which Marx also designates the simple circulation of commodities.

[139] Marx develops this point in *Grundrisse I*: "Therefore capital as money is not in contradiction with use value, since outside money it only exists precisely within use values. (...) From this point of view the opposite of capital cannot be again a particular commodity; because as such it does not constitute an antithesis to capital, since the substance of capital itself is use value; not this or that particular commodity, but every commodity. The substance common to all commodities (...) is being *objectified labor*. The only distinct from *objectified* labor is *non-objectified*, but still being objectified labor, *labor* as subjectivity. (...) Therefore, the only *use value* able to constitute an antithesis to capital is *labor* (and precisely value generating labor, i.e., *productive labor*)" (Marx, 1976a, p. 195-6).

general form. However, in order to be able to circulate freely, money has to be converted into standard of prices and means of circulation an payments.

On the other hand, from the fact that money and commodity are both forms of capital, as has been mentioned, and that the absolute opposition existing between them in the simple circulation system vanishes in capitalism, it follows that in capitalism both show what they actually are, i.e. just different forms of value: money the general and commodities the many particular forms (C, I, p. 153). In that way, while money is limited to be the general form of value, capital represents the unity of its general and its particular forms.Therefore capital represents neither money nor commodities, in isolation or taken togheter, but just the motion from one into the other and back again[140]. It is therefore evident that the properties of capital do not coincide with the ones of money, which are absorbed by capital, in the same way as capital absorbes the properties of commodities[141].

However, commodities are absorbed into the concept of capital not only as forms of value, their specific use values being of decisive significance to capital as well, in contrast to simple circulation, where they do not affect the character of the exchange. In phase M-C the use values involved in C are not indifferent: on the one hand, proportionally determined parts os M have to be converted into means of production and labor power; on the other hand, the specific character of the means of production are determined by the commodity to be produced, which is productive consumption. In this sense capital, besides being the unity of money and commodity, is also the unity of circulation, production and consumption. This is the reason why the complete formula of capital is M-C(MP+LP)--P--C'-M', instead of just M-C-M', which represents only the movement of capital within the sphere of circulation. It is the characteristics of P which determine the composition of C and the magnitude of M, not the opposite[142].

In order to stress the drastic nature of the evolution implicit in the transition of value from money form into capital form, Marx compared it to the evolution of monkey into man, pointing out that the theoretical mistake in economics consists of taking the inferior form - money - as the dominant one in relation to the superior form, which is capital, contrarily to the actual process[143]. Keynes' monetary approach in defining the *capitalist* economy as a *monetary economy* is subject to precisely that critic by Marx[144]. Money being the expression of the seller/buyer relation, the statement that money be the most relevant category of the economy implies the assumption that economic agents interact only as sellers and buyers of commodities, ignoring therefore the emergence of more developped economic relations corresponding to capital (Marx, 1976a, p. 170-1). Thus, according to the monetary approach the seller/buyer relation is the decisive one, and the phenomena of circulation are the most relevant, whereas in Marx's theory the capital/labor power relation is decisive and the sphere of production the most relevant.

4. Money in capitalism

In view of the dominance of capital relation upon money relation, the analysis of money in capitalism cannot consist in the direct application of the concepts corresponding to its forms and functions within simple circulation as laid out by Marx in *Capital* I. There are two main aspects to be considered: in the first place, the conditions presiding the circulation of commodities change decisively as a result of the dominance of capital upon money, which may be summarized by saying that the *credit system* replaces the *money system*, altering the ways and forms in which money performs its functions; second, the fact that money presents itself in capitalism in two different ways, on one side as mere money, and on the other side as a form of capital. Marx devoted great effort in demonstrating the need to distinguish these two faces of money in capitalism.

Marx made use of the concept of the credit system to designate the structure of the circulation of values peculiar to capitalism[145], in contrast to the concept of a money system, which designates the structure of circulation of values in simple circulation, i.e., through money in the functions of means of circulation and of payment. However, as Marx did not provide a clear and explicit definition of this expression, it embarasses the reader owing to the complexity that circulation exhibits in capitalism, the number and variety of its elements and of the ways they interact, rendering extremely complex the attempt to provide an accurate definition. This notwithstanding, the components of the credit system are indicated in his writings, making it possible to provide its general outline.

The credit system consists of two sets of elements, on one side commercial credit[146] and the function of means of payment of money [147], on the other side money-dealing-capital[148], interest-bearing capital and banker credit, closing with the development of the banking system, where all these elements combine. Whereas in the

[140] "(...) capital is not money, nor commodities (...). Capital has not material form as such, though it may be represented in material form" (Weeks, p. 133).

[141] A particular capital is generally quantitatively identified as a sum of money, but this does not mean that it efffectively exists in money form, but merely reflects the function of unit of account of money, referring to capital either in form of commodities or of money (or even just credit money). This usual procedure obscures the real nature of capital as distinct from money.

[142] Since the determining social relation, within capitalism, is the one ocurring within the sphere of production, between value represented by the means of production, and use value, represented by live labor power, if follows that the motion of the capitalist system is determined by the laws of this relation. This is the reason why the analysis of capital, performed by Marx in *Capital*, is basically the analysis of the capital/labor power relation, i.e., an analysis of capital, instead of the seller/buyer relation, which would consist of an analysis of money. The later will only emerge again at the end of the book, when Marx resumes the analysis of the sphere of circulation.

[143] "*Money* as *capital* is a determination of money that goes beyond its simple determination as money. It may be viewed as a superior realization, in the same way as one may say that the monkey develops into the human being. In contrast to this, it is usual that the inferior form be put as the dominant subject upon the superior form. Anyway, *money as capital* is distinct from *money as money* (Marx, 1976a, p. 173).

[144] The radical distinction between the concepts of capitalism according to Marx and Keynes has been examined by the author of the present paper (Germer, 1996a). See also Weeks (1981, p. 96-7).

[145] "The *credit system* is its own creation [from industrial capital - CMG], i.e., it is a form of the industrial capital, which starts with the manufacture and expands further with the large industry" (Marx, 1979a, p. 1466). See also De Brunhoff's interpretation (De Brunhoff, p. 76-83). De Brunhoff's book has only been available in the brazilian edition. Quotations presented here have been translated by the author from this edition.

[146] Commercial credit "forms the basis of the credit system" (C, III, p. 479)

[147] "Credit money springs directly out of the function of money as a means fo payment " (C, I, p. 139).

[148] "The purely technical movements performed by money in the circulation process ..." are the original functions of money-dealing-capital (C, III, p. 315), but it expands so that "the money trade becomes fully developed, even in its first stage, as soon as its ordinary functions are supplemented by lending and borowing and by credit" (Ib., p. 320).

money system it is money that mediates the circulation of commodities, in the credit system it is credit that performs this function. The essential difference between them is that money circulation expresses the process of autonomization of value, i.e., conversion of value from its particular forms of ordinary commodities into its general form of money. The circulation of credit, on the other hand, relates to the circulation of value as a continuous process of its expansion. The credit system however assimilates the money-system, because for values to expand it requires that they previously arise through its autonomization as money in the mere circulation. The circulation medium in the money-system is money, whereas in the credit system it is credit money, to be defined.

In addition to the complexity of money itself as a social relation represented by an object, whose forms and functions are further to a certain extent regulated by the State after the sphere of circulation has matured, money in capitalism presents itself under two different and superposed forms, which opperates as an additional factor of difficulty to the precise understanding of its specificity as money. The duplicity of money in capitalism consists in the fact that in the sphere of circulation it presents itself on the one side as simple money, i.e., as circulating medium[149], even in the name of capital, on the other side representing different kinds of capital in money form. The difficulty arises from the fact that the aggregate of physically homogeneous money differentiates itself according to the different roles each peace of money plays, i.e. simple money, money-capital as such and interest-bearing capital (DK, III, p. 420). Nevertheless, whichever the role money plays in the sphere of circulation, it performs only functions of money, so that the problem consists in identifying in the name of whom it does it in each case. Thus, as circulating medium money performs as means of circulation and payment, in the phases C-M or M-C. But these two functions may be performed in the name of consumers or of capitalists. In the first case money arises as money-form of revenue, within cycles C-M-C, mediating consumption, either of workers or of capitalists; in the second case it is money-form of capital, hence mediating the reproduction of capitals in its circulation phases, which relate to the last phase of one cycle and the first phase of the following one: ...C'-M'---M-C...; in the third case, money capital represented by money may be either the capitalist's own or borrowed interest-bearing capital, in which case the circulation becomes duplicated in the form M-M ... M'-M' (C, III, p. 340).

Functions of money in capitalism

The definition of money as the commodity which performs the function of general equivalent of value, which cameto be gold in capitalism, implies forcefully that, given the present structure of the credit system, *money itself circulates no more* within the domestic markets[150], although it still performs relevant functions as reserve and international means of payment. Thus within national borders there is no circulation of money, but only of substitutes of money, and additionally gold has been formally abandoned after 1971 as the official basis of the standards of prices. In this way, the present money standards seem not to possess intrinsic value or an objective standard, money having apparently been turned into a fully symbollic category. This situation challanges Marxist theory and led several writers to attempt to adapt it in ways that require his definition of money as a commodity to be discarded, under the implicit assumption that it would not affect the foundations of the theory. This assumption has already been objected in section 2 of this paper. Now I will try to dispute the hypothesis that the present organization of money sphere challanges Marx's theory of money. Assuming that theory should overcome the contradictions between the appearance of phenomena and the internal laws which determine them, and further assuming that the laws of motion of capitalism are still effective, it woul be indicated first to attempt to *explain* the present monetary reality based on Marx's theory, before attempting to adapt the later to the changing appearances. This does not seem to have been done sufficiently so far. To do so requires a previous discussion of the functions of money in capitalism.

The demonstration ot the continuing validity of Marx's definition of money requires two demonstrations: 1) that the total replacement of money (=gold) within circulation is not inconsistent with that definition, but on the contrary follows logically from it and Marx performed this deduction; 2) that abandonment of gold as the objective standard at the *formal level* does not imply his abandonment at the *level of the real economy*, as the general equivalent of value.

Money has been replaced as means of circulation by two substitutes derived from two of its functions, on the one side inconvertible paper money issued by the State and having compulsory circulation, which is a form of the symbol of value and originates in the function of means of circulation (C, I, p. 127-9), on the other side credit money under different forms. Credit money, whose more developed forms are the bank-notes and the central bank-notes, "springs directly out of the function of money as a means of payment" (Ibidem, p. 139), which has its origin in the emergence of a new economic function - commercial credit - or creditor/debtor relation, which superimposes on the value- or seller/buyer-relation[151]. The early historical form of credit money is the commercial obligation or bill of exchange. Marx emphasizes that since the beginnings of european merchant capital and of capitalism the commercial obligations were the more generally used means of circulation in large commercial transactions, the metallic money being confined to the circulation of small values. He himself provided figures in *Capital* to illustrate the overwhelming superiority of credit money over metallic circulation already at that time (C, I, p. 140). On the other hand, he also indicated that the expansion of credit money and the banking system would allow credit money to entirely replace metallic circulation within the domestic spheres of circulation[152]. Although Marx did not

[149] The functions of money as 'simple money' are the functions within circulation, i.e., medium of circulation and of payment. For this reason the mass of money that performs them may be called circulating medium.

[150] De Brunhoff points out rightly that the basis of credit money "is the circulation of credit, that is to say *a non-money circulation*" (De Brunhoff, 1978, p. 87).

[151] The function of money as means of payment is not merely a money phenomenon, since it results from a relation distinct from money as such, the credit relation. Therefore it consists of a combination of two economic relations: value and credit. Credit may also exist either without the existence of money, since even in barter one producer may anticipate his product to another one and receive the later's commodity in return later, or outside the circulation of commodities: "The character of creditor, or of debtor, results here from the simple circulation. (...) The same characters can, however, be assumed independently of the circulation of commodities" (C, I, p. 135).

[152] "The entire history of modern industry shows that metal would indeed be required only for the balancing of international commerce (...), if only domestic production were organised. That the domestic market does not need any metal even now is shown by the suspension of the cash payments of the so-called national banks ..." (C, III, p. 517).

mention identical possibility at the international level, the replacement of money in international transactions - which is already a reality - is consistent with his theory for the same reasons that apply to the domestic markets.

In this way it becomes apparent that the means of circulation which are replaced for money (=gold) derive their existence from money, instead of arising in opposition to it, which has been shown by Marx himself. It follows that its existence does not challenge the nature of money as a commodity and is not inconsistent with his definition of money either. Therefore, *in this sense* the efforts of Marxist authors who feel compelled to provide an alternative to Marx's definition of money are fruitless.

The demonstration that the formal abandonment of money (=gold) as a basis of credit money does not imply its actual abandonment is essential to the validity of Marx's theory of money. However, that attempt will not be accomplished in this paper in view of the difficulty of the subject. However, some evidences that are supposed to support that hypothesis will be provided. In the first place, one of the two following consequences, both inconsistent with Marx's theory, seem to follow necessarily from the assumption that credit money is no more based upon an objective standard. On the one side, assuming the validity of Marx's value theory implies that the function of measure of value may be performed by a totally immaterial hence symbolic unit, that is to say, that something without value at all should be able to measure values[153]. This is the same as to admit that a weightless object may serve as a standard of measure of weights. On the other side, Marx assumes that the content in terms of abstract labor - the substance of value - of the commodities, may only be measured through its exchange with something which contains abstract labor as well, i.e., another commodity. From this it follows that if one admits that values of commodities may be measured without reference to abstract labor as a standard, one has to admit also that values of commodities are not determined by its content in abstract labor.

Second, according to Marx, money, as represented in a commodity, is an element that emerges spontaneously form the process of exchange, as one of its necessary components. This means that money has not and could not have been arbitrarily created by the State. The State merely establishes the standard of money, i.e., it gives a name and puts its seal on a conventionally fixed quantity of the money-commodity adopted as unit of account and standard of prices. If money emerges spontaneously and not from the initiative of the State, if follows that it cannot be extinguished by the State, but only by the process of exchange. But this is impossible because, according to Marx's reasoning, the exchange of commodities is impossible without the existence of a general equivalent of value, as indicated in section 2. If it is correct to say that the State merely establishes the standard of prices based on money (=gold), the present circumstances of the capitalist economy could be interpreted as a refusal - or lack of power - from the State in establishing it officially. However, the dollar, and the sterling or the DM as well, are standards of money, they consequently express definite amounts of the money-commodity. If those standards are not formally established, it means either that they are being established informally, or that they fluctuate continuously independently from the State.

[153] This has been attempted by Lipietz, but it does not sound convincing, as will be indicated later.

Finally, the hypothesis that the suposedly immaterial character of present standards of money rendered Marx's theory of money inconsistent, requiring that Marxists provide an alternative theory, may be seen as an inductivist oversimplification. The fact is generally overlooked that the standards of money in capitalism were explicitly based on gold as general equivalent until as recently as 1971, and that the worldwide economic crisis - which then began to be acknowledged and has not come to an end up to the present - arouse as a monetary crisis of the standard type mentioned by Marx: as the crisis starts the prices of securities fall or are discredited and there is a run to money proper - gold. In fact, the end of the convertibility of the dollar, in 1971, cannot be attributed to a loss of relevance of gold, instead it was an effect of the fear that american gold reserves, which supported the dollar, were threatened with exhaustion in the case of a run of the central banks of the advanced capitalist countries[154]. On the other hand, the devaluation of the dollar, which the United States had refuse to admit and was then officially acknowledged, expressed a violent compatibilization of the stock of money to its real base - gold. The standard of money - the dollar - has been altered, once the gold content of the dollar had been officially fixed since 1934 in the relation of US$ 35 per ounce, and after 1971 the dollar has been substantially depreciated as measured by its relation to gold. It seems that in view of the new circumstances it is for Marxists to attempt to identify the new charachteristics of the relation of the standards of money to gold in our days, based on Marx's theory of money and credit money, instead of trying to provide alternatives based on oversimplified inductivist reasoning. The difficulty in disproving even one section of a complex and consistent theory like Marx's and others is very well known and in the present case it has as yet not been accomplished either by Marxists or by non-Marxists.

Marx indicated that in prosperous phases capitalism behaves as if it would be possible to free itself from the metallic basis, i.e., from money, but it always ends by crashing against it again and again as an obstacle which it is unable to overcome. Thus, according to Marx the need of a commodity that performs as money is one of the essential causes of the contradictions and crises of capitalism. Therefore, the abandonment of this need as a theoretical concept would imply the removal of one of the elements essential to the understanding of the contradictions and crises of the system. According to Marx some forms derived from money are able to overcome contradictions inherent to other forms, but none can free the system from the contradiction intrinsec to money and inherent to the commodity-form of the products of labor, between value and use value, i.e., "between [the] particular natural properties and [the] universal social properties" of commodities (Marx, 1976a, p. 61-2)[155].

Credit money

As has already been mentioned, two distinctions are to be taken into account when analysing money in capitalism according to Marx's theory. On the one side between money and capital, and on the other side between money as mere money and as

[154] The protection of the domestic reserves of gold against the risk of a drastic drain has been the cause of repeated suspensions of convertibility, at least since the famous English *Restriction Act*, effective between 1797 and 1819.

[155] "All contradictions of the *money system* and of the exchange of products within the money system represent the development of the condition of products as *exchange values*, of its determination as *exchange value* or simply *value*" (Marx, 1976a, p. 85-6).

money-capital. But there is an additional distinction, less emphazised at present in the literature, between money and credit money, which implies that the concept of credit money is not reducible to that of money, in the same way as capital is not reducible to it[156]. Credit money is a category peculiar to capitalism, in the sense that it depends on conditions that only exist after capitalism has developed, and which are not presupposed in the concept of money proper[157]. For this reason the phenomena of the monetary circulation in capitalism cannot be understood solely on the basis of the concepts derived from the analysis of money, which in itself is a category of the simple circulation. Some Marxist authors do not take this into account and apply concepts related to money itself directly to credit money, as when the functions of measure of value or of standard of prices are attributed to credit money. De Brunhoff rightly states that "the function of measure of value cannot be performed directly by credit money" (De Brunhoff, p. 88).

One of the bases of credit money is the function of means of payment, which arises with commercial credit in the simple circulation. But this refers only to the initial and primitive form of credit money, as represented in the bill of exchange used as a means of circulation and of payment. Commercial credit does not involve a money loan, but just an anticipation of a commodity or postponement of payment. In commercial credit there is no interest, which is a category that belongs to capital, not to money. The development of credit money as such requires the development of the banking system, of interest-bearing capital and of banker credit, elements which only arise with the development of capital. On the other hand, the starting condition of the banking system[158] is the reserves of money capital from industrial and commercial capitalists. The banking system connects itself to commercial credit at first through the discounting of bills of exchange. Later bank-notes of individual banks, representing rights to gold deposited at them, circulate in the place of gold, and finally the bank-notes from the central bank replace the notes from individual banks. It can be seen that credit money rests on the banking system and banker-credit, categories that do not exist in the simple circulation, which implies that credit money may be handled theoretically only within the context of developed capitalism. In summary, the concept of credit money combines elements of the simple circulation - money and its function of means of payment, and commercial credit - and from the mature capitalist economy - the banking system, interest-bearing capital, discount of commercial bills, banker credit, bank-notes and finally central bank-notes. Therefore money (=gold) is merely one of the elements which combine to form credit money.

Some significant consequences follow. Money (=gold) in capitalism does not perform any function *in the sphere of circulation*, therefore it does not perform as means of circulation or of payment. It doesn't either perform as a means for the building of money reserves by the capitalists, replaced by the credit they hold against banks (which until 1971 were supported by the gold reserve from de central bank). And what about the function of measure of value and standard of prices based on it? The function of measure of value can only be performed by the general equivalent, that is to say, gold. The standard of prices is determined by the State based on the measure of value, or money. Assuming there is no measure of value, it follows that the State cannot establish a standard of prices. Take the dollar, for example. In the same way as the sterling and other standards of money of developed countries, the dollar is not inconvertible paper money issued by the State and having compulsory circulation, it is instead central bank-note, that is, credit money. Every circulating dollar originally stood for a credit in real money (=gold) the holder had at the central bank. If the State does not establish the value of the dollar on the basis of the money-commodity, it does nothing except giving it a name, which is economically irrelevant. It follows that the standard of prices requires a commodity-measure of value as its basis.

The case of hoarding

The seemingly mistaken use of the concept of hoarding by Marxist authors illustrates the difficulties that arise when the differences indicated by Marx between the categories belonging to the simple circulation and to capitalist circulation are not carefully taken into account. It also illustrates the misleading influence of theories more firmly established in the universities and research centers. An example will be provided to illustrate this point: the influence of Keynesian theory on Marxian reasoning in the misunderstanding and overestimation of hoarding in capitalism.

In order to lay out Marx's approach to hoarding it is necessary to distinguish between form and content implicit in the concept of hoarding in the simple circulation and in capitalism. As to the form, hoarding consists of the building of money reserves, and in this aspect it is common to simple circulation and to capitalism[159]. However, as to the content, money reserves in the two situations are essentially different and Marx seems to have been quite clear about that, although his view is scattered in his writtings so that it cannot be found under one single topic. But as long as the distinction is based on his theoretical approach, it may be laid out as follows.

As to the content, what induces hoarding is the desire to accumulate wealth, which in the simple circulation may only be achieved by withdrawing *money* from circulation and piling it up[160]. In capitalism, however, the same motive may only be satisfied in the opposite way, i.e., by throwing money into circulation as *capital*. In capitalism it is the accumulation of capital[161] which responds to the "greed after riches" [162]. In capitalism

[156] Marx criticized the definition of capital as the sum of prices of means of production of a given investment, because it implies reducing capital to a sum of money, i.e. to mere money. Capital is indeed money, since it is value, however it is value plus new determinations which constitute the *differentia specifica* that distinguish it qualitatively from mere money.

[157] "Money based upon credit implies on the other hand conditions, which, from our standpoint of the simple circulation of commodities, are as yet totally unknown to us" (C, I, p. 127).

[158] What is meant here is the capitalist banking system, not its form previous to capitalism.

[159] When De Brunhoff, for example, suggests the "general definition of hoarding as interruption of the process of exchange" (De Brunhoff, p. 57 and 67), this refers to the form, not to the content or motivation of hoarding.

[160] In order to be relevant as a concept, hoarding should express an economic function of a really existing agent, like the hoarder in simple circulation, whose formula is C-M, i.e., a sale aiming at obtaining money to be hoarded. However, there are forms of money withdrawn from circulation that do not constitute hoarding. For example, the sums of money kept as reserve, in the simple circulation, as a result of the normal fact that the proceed of the sales is not converted into consumption goods instantly. Marx called it *suspended currency*, "mere techinal moment of the currency of money" (Marx, 1980a, p. 190).

[161] It has to be insisted that accumulating capital is not coincident with accumulating money, which is quantitatively given value, whereas capital is value in its dinamic shape, value in process of expansion, i.e., in the form M-C...P...C'-M'.

[162] "This boundless greed after riches, this passionate chase after exchange-value, is common to the capitalist and the miser; but while the miser is merely a capitalist gone mad, the capitalist is a rational miser. The never-ending augmentation of exchange-value, which the miser strives after, by seeking to save his money

even the preservation of value is not obtained by hoarding money. Every amount of money is an equivalent of capital, i.e., of value which could have expanded during the time it has been withdrawn from circulation. Thus, instead of preserving itself it decreases in relative terms as his owner suffers an opportunity cost consisting of the earnings he could have obtained in case he had invested his capital himself or lent it to another capitalist[163]. Consequently, money reserves as formed by individual capitalists are not induced by the desire to accumulate inactivated money, but appear as an undesired flaw of the process inflicted on them as a condition or an outcome of the process of reproduction of their capitals[164]. In addition to that, those reserves are not reserves of money but of money-capital, i.e. of potential capital in money form. According to Marx, the reserves that can be labeled hoards are basically the reserves for replacement of fixed capital and for expansion (C, II, p. 451, 493), as well as the ones for schedulled payments falling due in the near future (C, I, p. 142). It can be seen that this hoarding is only formally identical to hoarding as it exists within simple circulation, being totally different as to the content. It follows that in capitalism there is no economic function corresponding to hoarding, in the sense that there is no agent whose explicit function is to hoard inactive money. Hoarding in capitalism is just an unavoidable technical moment in the process of accumulation of individual capitals.

As a system however, capitalism rejects the inactivation of capital in private hoards, and with the intervention of the banking system converts the reserves of that part of individual capitalists who are eventually at surplus, into active capital in the hands of capitalists eventually at deficit in each moment[165]. In this way the sum total of the reserves of individual capitalists are reduced to a very small total reserve in the banking system, more specifically in the central bank[166]. It is only this reserve that may be labeled hoarding in the sense of inactivated money (De Brunhoff, p. 105 and 107). It turns out that the sum of money existing as hoarding is usually insignificant, except in times of economic slowdown or crisis, when reserves increase because a significant proportion of social capital is paralyzed. As a result of the excitement of accumulation and thanks to the banking system, even the money reserves scattered in the economy, arising from higher salaries and profits and meant for consumption along the near future, are converted in money-capital for lending purposes and thus in active capital. Thus not only the reserves of money-capital but also of mere money, which are not originally interest-bearing capital, become such through the intervention of the banking system.

It should also be noted that the money reserves deposited in the banks by capitalists do not constitute hoarding, on the contrary they express the conversion of reserves into interest-bearing capital, i.e., depositing reserves is in reality dis-hoarding. Second, the conversion of reserves into interest-bearing capital is not an aggregate result undesired by the individual capitalists. On the contrary, the capitalists who deposit reserves in the banks, do it because they reject their inactivation and with the explicit purpose of geting an earning from them. In so doing they do not act as hoarders but as money capitalists performing the corresponding economic function expressed in the circulation formula M-M', superimposing it to their function as productive capitalists[167]. In the case these capitalists had a positive purpose to inactivate money as hoarding, they should pile it up in safe boxes of their own or of specialized enterprises, which would not be banks.

It should be further noted that the loan capital belonging to money capitalists in the shape of interest-bearing capital difers clearly from the above mentioned. Interest-bearing capital does not constitute hoarding, either in the form or in the content, but loan capital accumulated by money capitalists with the explicit purpose of obtaining an earning in the form of interest. It does not consist of money or capital withdrawn from circulation, but on the contrary is supposed to be continually performing the cycle M-M', except in those already mentioned phases of crisis or slowdown in the process of reproduction, when a fraction of total capital, under all forms, is inactive. Being capital instead of merely money, the normal condition of interest-bearing capital is to be lent to active capitalists so as to produce surplus-value and render interest to their owners. Therefore, what their owners are usually supposed to have in their hands is not inactivated money, but titles of credit on loan capital.

Finally, there is a fraction of money capital which isn't immediately either reserve of money or interest-bearing capital, which consists of the money-form of circulating capital, deposited in the banks and converted into loan capital as well. It corresponds to that part of capital which has to be paid out in cash in the near future, in the function of means of circulation, as for example parts of the salaries and other current purchases.

As has been shown above, it is not the banks but the capitalists themselves who convert their reserves into interest-bearing capital when they deposit them, and in so doing act as money capitalists. The notion that capitalists act consciously as hoarders expresses the Keynesian view and misjudges a process inherent to capitalism. The notion of liquidity preference is necessary to Keynes in order to support his theory of the rate of interest, which he defines as a "reward for not-hoarding" (Keynes, 1980, p. 174). For this notion to have sense, one needs to assume that capitalists do have a positive propension for hoarding, i.e., withdrawing money from circulation and inactivating it into hoards. This provides the motive to define the rate of interest as the reward that justifies the dis-hoarding of money[168]. This seems to have been Keynes' way of escaping from the neoclassic notion of the interest rate as the money expression of the physical

from circulation, is attained by the more acute capitalist, by constantly throwing it afresh into circulation" (C, I, p. 153).

[163] "Withdrawn form circulation, [money] become[s] petrified into a hoard, and though they remained in that state till doomsday, not a single farthing would accrue to them" (C, I, p. 151).

[164] Lapavitsas rightly states that "hoards are structurally formed ..." (p. 315), i.e., originate necessarily from the movement of capital, not from the intentions of hoarders.

[165] "...hoards provide the basis for monetary credit and for the growth of the banking system. (...) banks turn hoards into interest-bearing capital, and so return the money to real accumulation" (Lapavitsas, p. 315). "One can understand the pleasure experienced when all these potential capitals within the credit system, by their concentration in the hands of banks, etc., become disposable, "loanable capital", which indeed is no longer passive and music of the future, but active capital growing rank" (C, II, p. 493).

[166] "... the effect of this function of the banking system is (...) to turn the inactive money reserves maintained by individual capitalists consistent with its almost complete removal concerning the capitalist class as a whole" (Germer, 1996b, p. 181).

[167] In this case the active capitalists function as money capitalists because the earnings they obtain from their interest-bearing capital does not correspond to profit but to interest.

[168] Keynes' concept of liquidity preference is dubious. He himself stressed that it does not coincide with hoarding, but with the notion of 'propensity to hoard', since its effect is not the increase in hoarded money but in the rate of interest (Keynes, 1980, p. 174). As Keynes himself explains, the liquidity preference reflects nothing but the normal withdrawal of investors who expect to obtain larger annual proceedings if they invest later instead of now (Ibidem, p. 201-2).

marginal product of capital, since he did not adequately distinguish capital from money and hence did not arrive to the concept of money representing money *capital*. Marx's theory of the rate of interest, on the other hand, does not need such a notion, since in his theory the rate of interest is determined by the supply and demand of interest-bearing *money capital*[169]. From the above it follows that, according to Marx's theory, the Keynesian notion of a propension to hoard - 'liquidity preference' - is inconsistent with the capitalist economy and with Marxian theory. The only propension consistent with capitalism is the propension to invest in order to obtain profit.

5. Conclusions

This paper attempted at identifying the logical connextion between Marx's theories of money and of capital, in order to contribute to the understanding of Marx's *theory of money in capitalism*, i.e., in order to be able to identify with greater accuracy the roles of money as such in the structure of the capitalist economy, according to Marx's views.

The need to combine the theories of money and of capital in order to obtain a *theory of money in capitalism* may be illustrated with the fact that the nature of credit money and of the credit system upon which it rests cannot be understood adequately barely on the basis of Marx's outline of money in the simple circulation, because in this phase capital still does not exist. Consequently the banker credit, i.e., credit in its capitalist shape and the banking system do not exist either. This means that the character of credit money cannot be drawn only from the character of money, but contains essential elements deriving from the nature of capital. In the same way the notion of hoarding, in capitalism, cannot be drawn merely from its definition in the simple circulation, requiring that the changes introduced in it by the characteristics of capitalist circulation be previously determined. In summary, the understanding of Marx's theory of money in capitalism cannot be obtained merely on the basis of his theory of money, which belongs to the simple circulation. Money and its properties are preserved in capitalism, but the functions it performs, and the forms in which it performs them, are altered in their ranking and shape as a result of the dominance o capital over money.

There is another reason why Marx's analysis of the specific role of money in capitalism constitutes an essential component of his theory of money as such. It follows from Marx's methodological indication, according to which the study of the most developped forms of a phenomenon allows to understand more accurately the less developped forms. This applies fully to the study of money, as a primitive form of value, originating in the simple circulation, whose characteristics become clearer after one understands the characteristics of capital as a more developped form of value.

The theoretical implications of the apparent dominance of purely symbolic standards of money in contemporary capitalism have also been examined strictly on the basis of Marx's theory. The unavoidable conclusion is that, according to that theory, money as a phenomenon of the market economy, must necessarily be a commodity. It does not follow however that the money-commodity has to circulate personally in any of its functions. In this sense, and considering additionally that the circulation of credit money may be defined as a 'non-money circulation', there is no inconsistency between the nature of the circulating medium of our days an the existence of a money-commodity as its basis. However, the consistency of a money-commodity system in the absence of an official link between the money-commodity and the conventional standard of money has not been demonstrated. Some indications habe been given however. This problem cannot be considered to be theoretically solved, and requires further research. Marxist authors should not let themselves be misled by the easy inductivist procedure of concluding that the money-commodity does not exist because it is not immediately visible.

[169] The comparison De Brunhoff makes between the concepts of hoarding of Marx and Keynes (De Brunhoff, p. 36-42) seems inappropriate since Marx's concept concerns simple circulation, whereas Keynes' refers to a phenomenon of interest-bearing capital in developed capitalism. It is surprising that she does not resume the comparison when analysing Marx's concept of credit money and credit system.

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RELEASE AND TYING UP OF PRODUCTIVE CAPITAL AND THE 'TRANSFORMATION PROBLEM'

Eduardo Maldonado-Filho[170]

1 - Introduction

Marx's solution to the 'transformation of the values of commodities into prices of production' has been criticized by the neo-Ricardians because "even if inputs prices are transformed, Marx's "solution" is internally inconsistent' (Steedman, 1977, p. 29). Steedman argues that Marx's procedure is inconsistent because he 'assumes that S/(C+V) is the rate of profit but then derives the result that prices diverge from values, which means precisely, in general, that S/(C+V) is not the rate of profit' (Steedman, 1977, P. 31). Steedman goes on and states that 'adherents to Marx's "solution" never attempt a direct reply to the above criticism. The reason is simple; the criticism is sound and cannot be answered' (Steedman, 1977, p. 31).

Since these Steedman's statements there has been several attempts to answer to the neo-Ricardian challenge (see, for example, Shaikh, 1977, 1984; Freeman, 1984; Lipietz, 1982; Kliman and McGlone, 1988; and Naples, 1989, 1993). These works have made some important contributions to the debate. For instance, Shaikh (1977) has shown that the transformation procedure is not about the transformation of values to prices but about direct prices (i.e. prices proportional to value) to prices of production. Besides, it has also be shown that Marx's procedure is an interactive process occurring in historical times, and not in simultaneous time which is characteristic of the neo-Ricardians' model. The static limitation of the neo-Ricardian approach has been demonstrated by several authors (Naples 1989; Freeman 1984; Kliman, 1993). Yet it is still unexplained what causes the differences between the so-called 'value' and 'money' rates of profit. The aim of this paper is exactly to address to this issue and to demonstrate, from the standpoint of Marx's circuit industrial capital, that this difference is but a consequence of the phenomena of release and tying up of productive capital which is brought about by changes in unit prices of the means of production and the workers' means of subsistence. By doing so we will be able to answer to the neo-Ricardians' criticisms and, therefore, to show that Marx's solution is perfectly consistent with the labor theory of value.

In other words, the aim of this paper is to show that if the phenomena of the release and additional tying up of productive capital, which are related with fluctuations in the unit value (or prices) of the means of production and labor power, are taken into account, then Marx's solution is correct and logically consistent. Moreover, we will also argue that Marx was well aware of this phenomena and of its implications in transforming values into prices of production.

This paper is organized as follows. In the first section we present Marx's concepts of release and tying up of productive and its implication for the circuit of industrial capital. Besides, we also show some evidence that Marx was well aware of the implications of these phenomena as far as the amount and the rate of profit are concerned. In the second section we will examine Marx's transformation procedure - which will be examined through the numerical example presented by Steedman (1977) in Chapter 3 of his book - in order to demonstrate that it gives rise to the phenomena of release and tying up of productive capital. We will also show that when these phenomena are taken into consideration there is no logical inconsistency in Marx's theory value and surplus value, as the neo-Ricardians claim[171]. The main conclusions of our analysis will be presented in the last section of this paper. All numeric examples will be presented in the Appendix.

2) The circuit of industrial capital and the phenomena of release and tying up of productive capital

In this section we will briefly review Marx's concept of release and tying up of productive capital and its implications for the circuit of industrial capital. Moreover, we will also present some evidence which suggest that Marx was well aware of the implications of this phenomena for transformation of values into prices of production.

2.1) The reproduction process and the release and tying up of productive capital

It should be pointed out that we will focus our attention on the emergence of these phenomena when it results from the changes in the price of the elements of the labor process (i.e. means of production, MP, and labor-power, LP). Therefore, other factors which may also bring about the release and tying up of capital - such as variation in the turnover time, increase in the productivity of labor, etc. - will not be analyzed.

According to Marx, industrial capital assumes, in the course of its circuit, three distinct forms: money-capital (M), productive capital (P)[172], and commodity-capital (C'). As a matter of fact, these three forms assumed by capital-value exist not only in succession but they also coexist side by side. The circuit of industrial capital can be described as follows:

$$M - C\{MP, L\}...P...C' - M'$$

This circuit begins with the capital-value in its money form (M). With a given amount of money the capitalist goes to two different markets: the commodities market (where he purchase the means of production necessary to produced his commodities) and the labor market (where he buys labor-power). In this way the transforms his capital-value from money into productive form. In its productive form the value-capital appears as two distinct processes: the labor process (which consists in the production of new use-values by means of the use-values bought previously in the markets) and the valorization process (which preserves the value of the means of production and, through living labor employed in production, creates new value). Thus the new commodities produced (C') have a total value which equals the value of the means of production transferred to the

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[171]Although we are going to use Steedman's numerical example, it should be clear that the results obtained are quite general and, moreover, that they are also important for the discussion of other phenomena like ground-rent and the tendency of the profit rate to fall.

[172]Productive capital, P, insofar as its material aspect is concerned, assumes the forms of means of production (MP) and concrete living labor (L). Whereas considered from its aspect of value (i.e. as a valorization process), productive capital assumes the forms of constant capital (C) and variable capital - living abstract labor or (V + S).

final product plus living labor employed (V + S) during the process of production - C' = C + (V + S). Part of the new value created only reproduce the value of labor power advanced (V) and the other part is the surplus-value (S) appropriated by the capitalist. In possession of the new commodities produced (C'), the capitalist return to the sphere of circulation in order to sell them and thus to transform his capital-value from the commodity into money form again. With the successful completion of the circuit, the capitalist must start this circuit again.

Let us now examine what would happen if at the beginning of the new turnover period the price of the means of production had fallen by (say) half. Assuming that the circuit, before the fall in the price of the MP, was as follows[173]:

$$M(\$100) - C(\$80_{MP},\$20_{LP})...P...C'(\$120) - M'(\$120)$$

Due to the reduction of the price of the MP the capitalist, assuming that the scale of production remains the same, will buy the same amount of the MP by $40 (instead of the $80 advanced earlier on) and the same amount of labor power by $20 (assuming that the price of labor power is unchanged). Therefore, the circuit of this industrial capital during its second turnover period can be represented as follows:

$$M(\$60) - C(\$40_{MP},\$20_{LP})...P...C'(\$80) - M'(\$80)$$

The reduction in the price of the MP, everything else remaining constant, results in the release of an amount of $40 of constant capital. Moreover, since this capital-value has not been returned to the production process in the second turnover period it cannot be transferred by labor to the final product. As a consequence, the commodity capital, although it remains unchanged in terms of use-values, has its total value declined from $120 to $80; that is, the reduction of the total value of the commodity capital equals the amount of constant capital which were released from production and which is kept in capitalist's 'pocket'.

It should be pointed out at this point that Marx defines release and tying up of capital as follows:

> 'By tie-up of capital we mean that certain portions of the total value of the product must be reconverted into elements of constant and variable if production is to proceed on the same scale. By release of capital we mean that a portion of the total value of the product which had to be reconverted into constant and variable capital up to a certain time, becomes disposable and superfluous, should production continue on the previous scale.' (Marx, 1977b, p.111).

If the price of the MP had become dearer then the capitalist would have either to tie up additional constant capital in order to keep the scale of production constant, or to reduce the scale of production.

Now, we are going to examine the consequences for the industrial capital if the value of the labor-power, as a result of the decrease in the value of the workers' means of consumption, falls from $20 to $10. More specifically, let us assume that, in our first example of the circuit of industrial capital, the capitalist, by advancing $20 as variable capital, could employ 50 workers, but in the second turnover period he has to advance only $10 in order to employ the same 50 workers. If we assume further that the working day and the intensity of labor remain unchanged, then the same number of workers (50) will still incorporated a new value of $40. However, $10 of the new value created will reproduce the variable capital advanced, and consequently the surplus-value will be equal to $30. In other words, the rate of surplus-value will increase from 100% to 300%. The circuit of the industrial capital at its second turnover period will be as follows[174]:

$$M(\$90) - C(\$80_{MP},\$10_{LP})...P...C'(\$120) - M'(\$120)$$

Therefore, as we have seen above, for Marx the release or tying up of variable capital does not result in any change in the total value of the commodity capital - as it is the case with the constant capital - but it does bring about modifications in the rate of surplus-value and in the total capital advanced.

We will further examine the effects of the release and additional tying up of constant and variable capital for Marx's procedure for the transformation of value into prices of production in section 3.

2.2) Marx on the release and tying up of Capital and its importance for the transformation procedure.

In this section we want to suggest that Marx was well aware of the importance of the release and tying up of productive capital for the transformation of "direct prices" into prices of production[175]. This claim, however, may seem rather strange because Marx's solution has been subjected to such an extensive investigation that it would seem very unlikely that this Marx's argument would go unnoticed. But, in our opinion, this nonetheless seems to be case. In order to give some support for our claim, we are going to indicate some textual evidence which indicates that Marx was in fact aware of the importance of these phenomena for the transformation procedure.

In the Theories of Surplus-Value, Part II, Chapter XVI: Ricardo's Theories of Profit, section 3c, Marx analyzes the 'Transformation of a part of profit and a part of capital into rent'. From this analysis Marx concludes that

> 'the differential rent ... in its material form as rent in kind, surplus-product, ... in the above example, is made up of two elements and due to transformations. Firstly: the surplus-product ... is changed from the form of profit into the form of rent.... Secondly: a part of the product which previously - when the product of the better type of land or mine was being sold at its own value - was needed to replace the value of the constant capital, is now, which each portion of the product possesses a higher market-value, free and appears in the form of surplus-product, thus falling to the landlord instead of the capitalist' (Marx, 1978a, p. 452).

[173]This example is taken from Marx (1978b, p. 344), where he presents the following example: "Let us now consider the manufacturer. Let us assume that he has laid out $100 in cotton twist and made a profit of $20. The product therefore amounts to $120. It is assumed that $80 out of the outlay of $100 has been paid for cotton. If the price of cotton falls by half, he will now spend only $40 on the cotton and $20 on the rest, that is $60 in all (instead of $100) and the profit will be $20 as previously, the total product will amount to $80 (if he does not increase the scale of production). $40 thus remain in his pocket. He can either spend it or invest it as additional capital". From this example Marx thus concludes that "what this phenomenon amounts to is this: release of a portion of the capital previously tied up in constant capital, or the conversion of a portion of the capital into revenue" (Marx, 1978b, p.344-345).

[174]"If wages fall in consequence of a depreciation in the value of labor-power ..., a portion of the capital hitherto invested wages is released. Variable capital is set free. In the case of new investments of capital, this has simply the effect of its operating with a higher rate of surplus-value... But in the case of already invested capital, not only does the rate of surplus-value rise but a portion of the capital already invested in wages is also released. Until this time it was tie up and formed a regular portion which had to be deduced from the proceeds for the product and advanced for wages, acting as variable capital if the business were to continue on its former scale. Now this portion is set free and may be used as a new investment, be it to extend the same business or to operate in some other sphere of production" (Marx, 1977b, p.114-5).

[175]It should be emphasized that our proposed solution to the so-called transformation problem does not depend on my suggestion that Marx saw the release and tying up of capital as part of the procedure to transform values into prices of production.

Moreover, he also acknowledges that 'these same elements are presented in all excess profit, for instance, if as a result of new machinery etc., a cheaply produced product is sold at a higher market-value than its own value' (Marx, 1978a, p. 453).

In the Theories of Surplus-Value, Part III, Chapter XXII: Ramsay, section 2, Marx analyzes 'the influence which changes in the value of constant and variable capital exert on the rate of profit' (Marx, 1978b, p. 328), and from this analysis - which we have already quoted in note 4 - he concludes that 'what this phenomenon amounts to is this: release of a portion of the capital previously tied up in constant capital, or the conversion of a portion of the capital into revenue' (Marx, 1978b, p. 344-345). Moreover, Marx also notes that

> 'this phenomenon of the conversion of capital into revenue should be noted, because it creates the **illusion** that the amount of profits grows (or in the opposite case decrease) independently of the amount of surplus-value. We have seen that, under certain circumstances, a part of rent can be explained by this phenomenon' (Marx, 1978b, p. 345-6, emphasis added). [Marx is referring to his analysis in Chapter XVI: Ricardo's Theories of Profit, section 3c, of the Theories of Surplus-Value, Part II which we have referred above].

In Capital vol. 3 Chapter VI: The Effect of Price Fluctuations - Marx also analyzes the phenomena of release and tying up of productive capital. At the beginning of section II, he states that

> the phenomena analyzed in this chapter require for their full development the credit system and competition on the world market, the latter being the basis and the vital element of capitalist production. These more definite forms of capitalist production can only be comprehensively presented, however, after the general nature of capital is understood. Furthermore, they do not come within the scope of this work and belong to its eventual continuation. Nevertheless the phenomena listed in the above title [i.e. appreciation, depreciation, release and tie-up of capital] may be discussed in a general way at this stage. They are interrelated, first with one another and, secondly, also with the rate and amount of profit. **They are to be briefly discussed here** if only because they create the impression that not only the rate, but also the amount of profit - which is actually identical with the amount of surplus-value - could increase or decrease independently of the movements of the quantity or rate of surplus-value' (Marx, 1977b, p. 110, emphasis added).

Furthermore, Marx calls our attention for the following, which does have a direct relation on the transformation of values into prices:

> 'we proceed in this entire analysis from the assumption that the rise or fall in prices expresses actual fluctuations in the value. But since we are concerned with the effects such price variations have on the rate of profit, it matters little what is at the bottom of them. The present statement apply equally if prices rise or fall under the influence of the credit system, competition, etc., and not on account of fluctuations in value' (Marx, 1977b, p.113).

Finally, we should stress that when Marx is directly concerned with the 'Conversion of profit into average profit' - that is, with the transformation of values into prices of production - he clearly indicated that

> 'Inasmuch as capital was tied up or released by such fluctuations of value, it was not only the rate of profit, but the profit itself, which was likely to be affected in this indirect manner. However, this has then always applied only to such capital as was already invested, and not to new investments. Besides, the increase or reduction of profit always depended on the extent to which the same capital could, in consequence of such fluctuation of value, set in motion more or less labor; in other words, it depended on the extent to which the same capital could, with the rate of surplus-value remaining the same, obtain a larger or smaller amount of surplus-value. Far from contradicting the general rule, or form being an exception to it, this seeming exception was really but a special case in the application of the general rule.' (1977b, p. 143-44, emphasis added).

These quotations are sufficient, in our opinion, to show Marx awareness of the logical relationship between the transformation procedure and the phenomena of release and tying up of productive capital. As we have seen, according to him the equalization of industry rates of profit (if everything else remains constant) brings about the phenomena of release and tying up of productive capital. And if one does not take into consideration the occurrence of these phenomena, he gets the **illusion** that profits may be different from the total surplus-value and that the so-called 'money' profit rate differs from the so-called 'value' profit rate.

3) Marx's Transformation Procedure

3.1) Steedman's numerical example

Steedman presents the following table of physical inputs and outputs which, in Marx's terms, represents the labor process and, thus, the technical composition of capital.

Table 1: Inputs and Outputs

	Iron (tons)	Labor(hr)	Final Product (tons)
1) Iron Industry	28	56	56
2) Gold Industry	16	16	48
3) Corn Industry	12	8	8
Total	56	80	-

In order to simplify our presentation we are going to assume that the length of the working-day is equal to 8 hours, and the intensity of labor is constant. Thus, 8 hours of labor correspond one worker, and by making this transformation of hours of labor into number of workers we obtain the following picture of the labor-process (which is equivalent to the former one):

Table 1A: Inputs and Outputs

	Iron (tons)	Number of Workers	Final Product (tons)
1)Iron Industry	28	7	56
2)Gold Industry	16	2	48
3)Corn Industry	12	1	8
Total	56	10	-

Steedman assumes that the real wages are equal to 5 units of corn for 80 hours of labor, it thus follows that the real wage of 10 workers is equal to 5 units of corn. Hence, the real wage per worker is equal to .5 units of corn. From Table 1 (or Table 1A) Steedman calculate the value embodied in the commodities during the process of production

as follows:

$28l_i + 56 = 56li$ $16li + 16 = 48lg$ $12li + 8 = 8lc$

or, $l_i = 2$ $16(2) + 16 = 48lg$ $12(2) + 8 = 8lc$

or, $lg = 1$ or, $lc = 4$.

Since the value of the labor power is equal to $.5l_c$, and l_c=4, it follows that the value of one unit of labor power is equal to 2, that is, V = 2. The surplus value produced by each worker is then equal to S = 8-2 = 6. He then may set out the value representation of the labor process, or the valorization process, as follows:

Table 2:

	C	V	S	M'
1) Iron Industry	56	14	42	112
2) Gold Industry	32	4	12	48
3) Corn Industry	24	2	6	32
Total	112	20	60	192

For reasons that will become clear later on, we are going to change silver industry for gold industry. This hypothesis is only a device to keep the changes in prices which were due to the release and tying up of productive capital separated from those changes which will come from variations in the value of the money-commodity. Therefore, for the time being, the three industries in Steedman's example will be: 1) iron; 2) silver; 3) corn industries. The money-commodity will be gold and we are going to assume that 1 hour of labor is embodied in 1 unit of gold ($1). This hypothesis thus implies that there is no gold production in this economic system, but we will further assume that 192 units of gold (money-commodity) circulates in the economy. At the first period of production (period 1), the value of gold and silver are equal[176].

It is important to stress that the length of the working-day as well as the intensity of labor are going to remain unchanged. Furthermore, the labor process will be also unchanged, and hence not only the scale of production but also the technical composition of capital will remain constant throughout Marx's transformation procedure.

3.2) Marx's solution

As we have already pointed out, we are going to work out Marx's solution through Steedman's numerical example. In order to carry out the transformation of values into prices of production we are going to rearrange Steedman's tables so that we can use only one table each time[177]. Tables 1A and 2 are jointly presented in Table 1 (see the Appendix).

We are going to assume further that the period of production is equal to one working-day for all and each industry (capital). This assumption will also facilitate our exposition.

Assuming that competition compels the capitalists to sell their commodities at the price of production rather than at their values, we get the results presented in the Table 1 (which represents the first period of production and circulation of commodities). As a consequence of the equalization of industry rates of profit, industry 1 (iron industry) produced a commodity- capital equal to $112 but it is able to realize only $101.818. Therefore, this industry is forced by competition to give up a value equal to $10.182, whereas industry 2 (silver) has a commodity-capital of $48 but it realizes (that is, transform its commodity-capital into money-capital) $52.364 - what implies that industry 2 gets $4.364 more value than it has created. However, in the system as whole, these deviations cancel each other out.

It is important to pointed out that there is no disagreements between sale and purchase prices. At this period of production, sales prices are equal to purchase prices, as it should be[–]. But as reproduction proceeds, these new inputs prices are carried out to the next production period, that is the inputs are also transformed. Let us then assume that the capitalists have finished their production of the first period and sold (and purchased) the commodities in order to produce and consume again, at the same scale, in the next period.

Let us look at industry 2. It has realized a value of $52.36, in other words, it has transformed its commodity-capital into money capital which amounts to $52.364. Now, in order to continue its process of production, capital 2 has to buy 16 units of iron, which costs now $1.818 and hires 2 workers at the money wages of $4.727 (V = 2x.5x$4.727). Therefore, from the proceeds ($52.364) capitalist 2 has to reconvert $29.091 into constant capital and $4.727 into variable capital, which represents a total advanced capital for period 2 of $33.818. But let us recall that in period 1, his constant capital was equal to $32 and his variable capital was equal to $4. However, because the prices of production are different from values (i.e. direct prices), capitalist 2 can buy the same amount of means of production (16 units of iron) with less money-capital ($2.909), and, on the other hand, he has to increase his expenditure of variable capital by $.727. Therefore, capitalist 2 has kept $2.182 of his value-capital in money form and transformed $33.818 from money form into productive capital[178]. By hypothesis, all amount of profit realized as revenue. It thus follows that $2.909 of constant capital have been released from the productive sphere while an additional $.727 of variable capital have been tied-up, which makes the total amount of productive capital to be released equal to $2.182[179]. The release of capital means that part of the value capital is not transformed back into productive capital, it remains in money form. By repeating the same analysis for each industry we obtain the following calculations:

A) Amount of constant capital in period 2:

Industry 1: 28 units of iron x $1.818 = $50.909

Industry 2: 16 units of iron x $1.818 = $29.091

Industry 3: 12 units of iron x $1.82 = $21.818

B) Amount of variable capital in period 2:

Industry 1:7 workers x .5 units of corn (real wage) x $4.727 = $16.455

Industry 2:2 workers x .5 units of corn (real wage) x $4.727 = $4.727

Industry 3:1 workers x .5 units of corn (real wage) x $4.727 = $2.364

C) Amount of surplus-value in period 2 (S = value added - variable capital):

Industry 1: S = $56 - $16.545 = $39.455

Industry 2: S = $16 - $4.727 = $11.273

[–] We are going to use the symbol $ to indicate the expression of value in terms of the money-commodity (gold), or simply in money terms.

[177] We are going to follow Marx in the form which the tables are presented. See, for example, Theories of Surplus-Value, Part II, Chapter XIII.

[178] Steedman, because he assumes prices to be set in instantaneous time, mistakenly claim that "this is nonsensical since the sale and purchase are two aspects of the same transaction. Hence inputs must be transformed as well as outputs" (Steedman, 1977, p. 43-4).

[179] As we shall see in the next section, the capital-value which has been released, because we are assuming simple reproduction, must be spent as revenue by the capitalists.

[180] It is important to stress that by release of capital Marx means "that portion of the total value of the product which had to be reconverted into constant or variable capital up to a certain time, becomes disposable and superfluous, should production continue on the previous scale" (Marx, 1978b, p. 111).

Industry 3: S = $8 - $2.364 = $5.633.

In Table 2 of the Appendix we present the complete results for the second period of reproduction. Let us now compare period 2 with period 1 as far as the total capital is concerned.

Due to the reduction of the price of iron from $2 to $1.82, the value of the total constant capital has decline from $112 to $101.818, and since the price of corn has risen from $4 to $4.727, the variable capital has been increased from $20 to $23.636. These changes have different effects on the rate of profit, which is equal to S/(C + V).

First, let us examine the influence of the additional variable capital which is tied-up. This phenomenon (the transformation of part of the surplus value into variable capital) has a two-fold effect on the rate of profit. On the one hand, by decreasing the rate of surplus-value it decreases the total amount of surplus-value, which means that the numerator of the profit rate decreases. On the other hand, by increasing the variable capital it increases one component of the denominator of this ratio. Then, if the increase in variable capital is equal to d (and hence the surplus-value is reduced by d) we would have that:

$$r^*_1 = S/(C + V) = 60/(112+20)= .4545$$

while in period 2 we would have that:

$$r^*_2 = (S-d)/[C+(V+d)]$$

Now, let us examine the influence of the release of constant capital upon the rate of profit. The reduction of the constant capital does not have any effect on the rate of surplus-value, hence on the amount of surplus value either. However, a 'fall or rise in the value of the elements of constant capital affects the rate of profit by altering the ratio of surplus-value to the total capital outlay' (Marx, 1978, pp. 347-8). Thus, if the reduction in constant capital is equal to d (as a consequence of the release of constant capital by an amount equal to $d), we have that the new rate of profit is:

$$r^*_1 = S/[(C-d)+V]$$

Therefore, the release or additional tie-up of variable capital, under our assumptions, can only change the rate of surplus-value and therefore the rate of profit, but it cannot have any effect on the total value created. Nevertheless, a change in the amount of constant capital has an equal effect on the total amount of value which is transferred to commodity capital during the production process. In this example we have that the total amount of constant capital released from period 1 to period 2 is equal to $10.182 and the reduction in the total value of the commodity capital is also equal to $10.182 ($C_{1'}$=$192 - C2'=$181.818).

We are now in condition to sum up the effects of the release or additional tie-up of constant and variable capital on the circuit of industrial capital. Changes in the amount of constant capital, with labor process remaining unchanged, has the following effects:

1. changes the total amount of value transferred to the commodity-capital by the same amount of the variation in C;
2. has no direct effects on the rate and the amount of surplus-value;
3. changes the rate of profit since $r^*_1 = S/[(C-d) +V]$.

The changes in the variable capital, which is due to fluctuations in the prices of the elements which make up the real wage, have the following effects:

1. they do not affect the total amount of value incorporated, during the production process, into the commodity capital;
2. they change the rate of surplus value and, as a consequence, the total amount of surplus-value appropriated by capitalists;
3. they change the rate of profit because both the amount of surplus and of the variable capital change in opposite direction and by the same amount. That is,

$$r^*=(S+-d)/[C+(V+-d)].$$

Let us now return to the reproduction process. By repeating these calculations we get a new situation for each new period of reproduction. From period 17 onwards the situation becomes stable, that is, the phenomena of release and tying up of productive capital ceases to happen, and consequently the reproduction process, also in terms of value, remains unaltered over time (see Appendix for the presentation of the results for all seventeen reproduction periods).

It is clear that in period 17 - as a matter of fact this happens in all reproduction periods - the sum of prices of production is equal to the sum of values ($172.692) and the sum of profits is equal to the sum of surplus-value ($59.138). Therefore, the general rate of profit is equal to r* = S/(C+V) and it is exactly what Marx claims it to be.

However, there is a difference in the general rate of profit between period 1 and period 17 which has to be explained. We have already discussed it briefly above but it seems to be worthwhile to deal with this difference again, since the phenomena of release and tie-up of capital 'create the impression that not only the rate of profit, but also the amount of profit - which is actually identical with the amount of surplus-value - could increase or decrease independently of the movements of the quantity or the rate of surplus-value' (Capital, 1977b, p. 110).

How can we explain the change in the rate of profit from period 1 to period 17 if there has been no real change in the economy?

Because there has been a successive change in the individuals prices of production of the iron and corn during these reproduction periods, although both the scale and the technical composition of capital have been unchanged, two effects have occurred. On the one hand, there has been a release of constant capital which equal to $19.308 (=$92.692-$112) and, on the other hand, there has been an additional tying-up of variable capital equal to $.862 (=$20.862-$20) with the consequent reduction of the amount of surplus-value by $.862 (S=$59.138-$60). Therefore, the rate of profit in period 1 was:

$$r^*_1 = $60/($112+$20)= 45.45\%$$

Nevertheless, due to the release and additional tie-up of capital, the rate of profit in reproduction period 17 is equal to:

$$r^* = ($60-$.862)/[($112-$19.308)+($20+$.862)= 52.08\%$$

Therefore, the rate of profit has changed for two reasons: (i) because part of the constant capital has been released and; (ii) because part of the surplus-value has been transformed into variable capital.

3.3) Analysis of the Reproduction Process as a Whole[181]

However, we still have two problems to consider. First, as we know, at the beginning of the reproduction process we had a total value of $192 (C'=$192) and now, at period 17, the total value produced is equal to $172.692, that is, $19.308 less value has been materialized in total output than in period 1. How is it possible for $19.308 disappear from sight? Secondly, what happens with the capital that has been released?

In fact, we have already solved the first problem. At period 1, $192 was materialized in the total commodity-capital ($C_{1'}$), but due to changes in the individuals prices of production part of the capital-value was not reconverted from its money form into productive (constant) capital and therefore ends to act as capital-value for the capitalist class. As the reproduction process continued, and the process of release of constant capital also continued to happen, an increasing part of the capital-value (although in a decreasing ratio) ceased to function as capital. Consequently, this constant capital which has been released from production could not be incorporated into the next commodity capital produced. At reproduction period 17 we thus have the following situation: total constant capital, C = $92.692; total variable capital, V = $20.862; which makes the total productive capital to be equal to $113.554. The total amount of constant capital which were released from the reproduction process is equal to $19.308. As we have already explained, an increase in variable capital implies into a decrease in the amount of surplus value, but that part of the constant capital which is not reinvested (that is, reconverted into productive capital) cannot be transferred to the final product. Therefore, the decrease in the total amount of value produced in the economy (but it should be stressed that there has been no change whatsoever in the production of use-values) is because an equal amount of constant capital has been released. Indeed, if we add up the total value transferred and the total value materialized within the production process in reproduction period 17 with the total amount of constant capital which has been released from the production process (and, as we shall see below, which has been converted into revenue), which equals to $19.308, we get the same amount of value this economy produced at the first period of reproduction, namely $192 (= $172.692 + $19.308). In other words, $19.308 of the original constant capital has been released, and as a consequence it has ceased to be incorporated into the commodity capital produced from period 17 onwards.

From the foregoing we can see that it is important not only to pay attention to the transformation of variable capital into surplus-value (or vice versa) and its effect on the rate of surplus-value, and consequently on the rate of profit, but also that special attention must be placed on the release or tying up of constant capital. These latter phenomena not only affect the rate of profit but they also influence the total amount of value produced in the economy.

Let us now turn to the second question, namely: what happens with the capital-value which has been released?

So far we have only focused our attention on the circuit of capital, but to get an answer to our question we must consider both the circuits of capital and of revenue.

At the end of reproduction period 1, the capitalist class has produced a commodity capital of $192 (which is made up of 56 units of iron, 48 units of silver and 8 units of corn). This commodity capital must now be sold, and they are to be sold, according to our assumptions, at their individual prices of production. It is the capitalists of industries 1, 2, and 3 which buy the 56 units of iron (which amounts to $101.818). They also hire 10 workers, paying $23.636 for them to work at the second period of production. The workers use their wages in order to purchase 5 units of corn. After those sales, it is left unsold 3 units of corn and 48 units of silver, which must be purchase by the capitalist class for their individual consumption.

As we can see in the table of period 1 in the appendix, the total profit appropriated by capitalists is equal to $60, but the capitalist total consumption (KC) would be equal to

KC_1 = 3 units of corn*IPPC + 48 units of silver*IPPS

KC_1 = 3*$4.727 +48*$1.091 = $ 66,545

It is clear then that capitalists' revenue (i.e. profits) is insufficient to allow them to buy all their allotted consumption basket. In fact, with their total profits the capitalist class would be able to purchase 3 units of corn and only 42 units of silver. Thus, it would remain unsold 6 units of silver. However, in order to keep the economy under simple reproduction assumptions, the capitalist class must convert the total capital released (which, at this first circulation period equals to $6.545) into revenue. By using the total capital released as revenue, the capitalists can buy all six unsold units of silver (6 units of silver*IPPS = $6.545).

As can be seen in Table 18 of the Appendix, the foregoing analysis holds for all 17 periods of reproduction. We can thus state that the analysis of the 'transformation problem' which is carried over within the framework of simple reproduction implies to assume that all capital that is released must be converted into revenue.

3.4) Comparing Steedman's and Marx's Results

Let we now compare the results which were obtained by Steedman using the neo-Ricardian model with those which we have obtained using Marx's procedure.

First of all, it is important to recall (see page 15 above) that we have changed the silver industry for the gold industry in the Steedman's example, this was done in order to have gold as the money-commodity, and consequently to keep constant the value of gold (i.e. that 1 hour of labor is embodied in 1 unit of gold, $1) during the reproduction process. This hypothesis allowed us to keep separated the changes in prices which were due to the release and tying up of productive capital from those changes which would have resulted from variations in the value of the money-commodity. But now, in order to compare both results we must express all money values in terms of commodity 2 (silver in our example). By doing so we get the following results:

Variables	Steedman's results	Marx's results
Price of iron ($p_{i)}$	$1.705	$1.704
Price of corn (pc)	$4.296	$4.297
Wage rate (w)	$.268	$.269
Profit rate (r)	52.08%	52.08%

Therefore, leaving aside rounding errors, Marx's procedure for transforming direct prices to prices of production gives us the same results as that obtained by neo-Ricardian approach, but very different analytical results emerged.

[181] I want to acknowledge my debt with A. Kliman who has pointed me out that unless the capital that has been released is converted into revenue, the conditions for simple reproduction will no be satisfied.

The time patterns of the rate of profit and the rate of surplus-value during the seventeen reproduction periods are shown in the Figures below.

4) Final Remarks

The neo-Ricardian criticisms of Marx's theory of value and its conclusion that 'no value magnitude plays any significant role in the determination of the rate of profit (or prices of production)' (Steedman, 1977, p. 65), has been shown to be unsound. For each period of reproduction, we have that the rate of profit is given by S/(C+V) and the sum of production prices is equal to the sum of values whereas the sum of profits is equal to the sum of surplus-value. Thus the so-called "invariance postulates' hold good for each reproduction period. Consequently, the 'inconsistency' in Marx's solution is only apparent, an illusion[182], which is created by the neo-Ricardian's method of "solving" it (which is based on the conception of instantaneous time, instead of Marx approach that treats price formation in terms of real time). As we shown above, the neo-Ricardian methodology obscure na important phenomena: not only the release and tying up of productive capital, but also the conversion of part of the capital-value (i.e. capital which has been released from production sphere) into revenue.

When we take the phenomena of release and tying up of capital and the conversion of capital into revenue into account, the solution derived by using Marx's procedure for transforming 'values' (i.e. direct prices) into prices of production is consistent with the law of value - as Marx always claims it to be. In fact, the solution presented in this paper is not only perfectly compatible with the law of value, but, as a matter of fact, it logically follows from it.

In the preceding section, we have examined the effects upon the reproduction process which are brought by the assumption that competition compels the capitalists to sell their commodities at their prices of production rather than at their values. By using Marx's procedure we were able to solve the so-called 'transformation problem' and to show the inadequacy of the neo-Ricardian methodology for dealing with this problem since it obscure some important changes and, as a consequence, it gives the illusion that there exist an inconsistency between values and prices of production. In our opinion, in the foregoing analysis Marx's method is shown to be much more powerful than the neo-Ricardian one.

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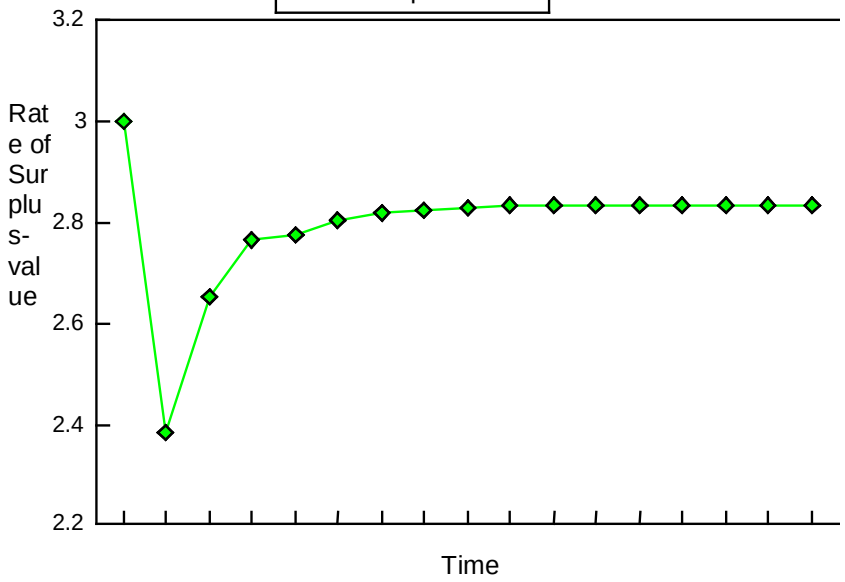
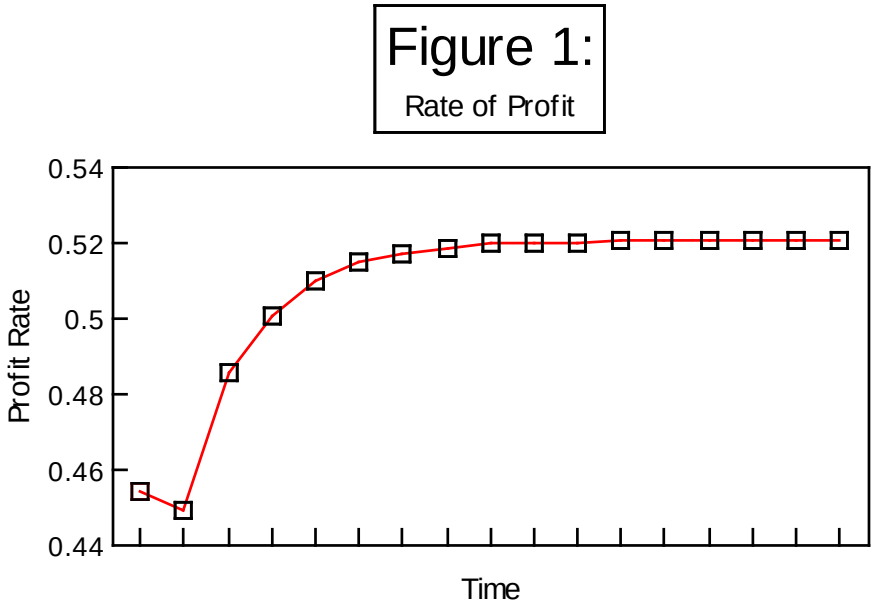
[182]Let us recall that, according to Marx (1977b, p. 110; emphasis added), the phenomena of release and tying up of capital "are to be briefly discussed here if only because they create the **impression that not only the rate, but also the amount of profit - which is actually identical with the amount of surplus-value - could increase or decrease independently of the movements of the quantity or rate of surplus-value**".

Figure 2:

Rate of Surplus-Value





THE "NEW SOLUTION" TO THE TRANSFORMATION PROBLEM: A SYMPATHETIC CRITIQUE

by Fred Moseley

In the 1970s, the "neo-Ricardian" or "Sraffian" interpretation of Marx's theory, as represented by the works of Meek, Dobb, Morishima, Steedman, etc. came to be the dominant, most widely accepted interpretation. By the "neo-Ricardian interpretation, I mean primarily that: (1) the fundamental givens in Marx's theory are assumed to be the physical quantities of the technical coefficients of production and the real wage and (2) the rate of profit is determined simultaneously with prices of production and both are derived from the above physical quantities.

Since the early 1980s, there have been a growing number of challenges to this dominant neo-Ricardian interpretation of Marx's theory. The first, and still the best known and most important, of these challenges to the neo-Ricardian interpretation has been the so-called "new solution" to the transformation problem, which was first introduced independently by Duménil (1980 and 1983-84) and Foley (1982 and 1986), and has since been followed by Lipietz (1982), Glick and Ehrbar (1989), Mohun (1993), and others. This paper presents a "sympathetic critique" of the "new solution" interpretation, from the perspective of my own "macro-monetary" interpretation of Marx's theory. The paper is "sympathetic" in the sense that I think that the "new solution" is a very important first attempt to break away from the dominant neo-Ricardian interpretation, but it remains a critique in the sense that I think that the "new solution" has been only partially successful in making this break. This paper will concentrate on the works of Foley, Duménil, and Mohun. The first section presents a brief summary of my own interpretation of Marx's theory, as the perspective from which the "new solution" is considered.

1. "Monetary" interpretation of the initial givens in Marx's theory[183]

The central concept of Marx's theory is the concept of capital, as the title of the book suggests. The concept of capital is defined by Marx in Chapter 4 of Volume 1 of Capital as money that makes more money, i.e. as M - C - (M+ΔM). The key point to emphasize here is that Marx's key concept of capital is defined in terms of money, not in terms of labor-time. Capital is clearly and emphatically defined in terms of money in all the various drafts of Capital, including the Grundrisse (pp. 250-71) and the "1861-63 Manuscript" (Marx and Engels 1988, pp. 9-20), as well as the final published versions of Volume 1. The title of Part 2 of Volume 1 is "The Transformation of Money into Capital." The two chapters of the Grundrisse are entitled "Chapter on Money" and "Chapter on Money as Capital." Of course, according to Marx's theory, all money represents abstract labor-time, and so do these quantities of money capital. However, the specific phenomena to which Marx's concept of capital refers are flows of money capital. In discussing the circulation of capital, Marx continually refers to the capital "thrown into circulation" and the capital "withdrawn from circulation." Clearly Marx is talking here about quantities of money capital advanced into and withdrawn from

183. See Moseley (1993) and (1997c) for a more complete discussion of my interpretation of the monetary nature of the initial givens in Marx's theory. Other authors who have presented similar interpretations include Carchedi (1991, Chapter 3), Mattick, Jr. (1981), and Mage (1963, Appendix A).

circulation. Money is not here merely an "illustration" of quantities of labor-time. Marx is not talking about the labor-time embodied in the means of production or the means of subsistence thrown into and withdrawn from circulation.

Similarly, the concept of surplus-value is also defined by Marx in Chapter 4 (and the various drafts of this chapter) in terms of money, as the increment of money, ΔM, that emerges in the final phase of the circulation of capital. The main question addressed by Marx's theory of surplus-value in Volume 1 is the origin and magnitude of this increment of money that is characteristic of capital. In Chapter 7 of Volume 1, Marx succinctly stated the conclusion of his theory of surplus-value as follows: "The trick has at last worked: money has been transformed into capital." (p. 301; emphasis added)

Constant capital and variable capital are then defined in Chapter 8 of Volume 1 as the two components of the money capital (M) that initiates the circulation of capital. In other words,

$M = C + V$.

The key point to be emphasized again is that constant capital and variable capital, like the general concept of capital of which they are component parts, are also defined in terms of money. Constant capital is the money capital used to purchase means of production and variable capital is the money capital used to purchase labor-power. Constant capital is not defined as the labor-time embodied in the means of production and variable capital is not defined as the labor-time embodied in the means of subsistence. Although these latter definitions are probably the most commonly accepted definitions of constant capital and variable capital, these definitions ignore Marx's own definitions of the general concept of capital and its two component parts - all of which are clearly defined in terms of flows of money capital.

Therefore, it seems clear that Marx's key concepts of capital, constant capital, variable capital, and surplus-value are defined in terms of money, not in terms of labor-time. The further question to be addressed now is: how are the quantities of money constant capital and money variable capital, the two components of the initial money capital M, determined, first in Marx's theory of surplus-value in Volume 1 and then in his theory of prices of production in Volume 3.

I argue that these quantities of constant capital and variable capital are taken as given in both of these stages of Marx's theory. The same quantities of constant capital and variable capital are taken as given in both of these stages. The only difference is that in Volume 1 the aggregate amounts of constant capital and variable capital for the economy as a whole are taken as given, and in Volume 3 the disaggregated amounts for each industry are also taken as given. The sums of the individual amounts taken as given in Volume 3 are equal to the aggregate amounts iin Volume 1. Therefore, these amounts of constant capital and variable capital remain "invariant" in the transition from Volume 1 to Volume 3 - because the same amounts of constant capital and variable capital are taken as given at both stages of this analysis. We will now examine each of these two stages of Marx's analysis in greater detail.

a. Marx's theory of surplus-value

To begin with, it should be briefly mentioned that another important aspect of my interpretation, which I have discussed at length elsewhere (Moseley 1997a and 1998) is that I argue that Marx's theory is based on the methodological principle that aggregate magnitudes are determined prior to the determination of individual magnitudes. This premise means that Volume 1 of Capital applies to the capitalist economy as a whole and is primarily about the determination of the total amount of surplus-value produced in the total economy. This total amount of surplus-value is determined prior to the division of this total amount into separate, individual parts. The general rate of profit is also determined by this aggregate analysis prior to the determination of individual prices, as the total surplus-value divided by the total social capital. The individual component parts of surplus-value are then determined in Volume 3, with the predetermined total amount of surplus-value and the general rate of profit taken as given. Marx expressed this assumed order of determination between aggregate magnitudes and individual magnitudes in terms of the distinction between "capital in general" and "competition" (or "many capitals") (see Rosdolsky, pp. 41-50 and 367-75).

In Marx's aggregate theory of surplus-value in Volume 1, I argue that the aggregate quantities of money constant capital and money variable capital are taken as given, as the initial quantities of money capital used to purchase means of production and labor-power in the first phase of the circulation of capital. Marx's theory of surplus-value explains how this the initial quantity of money (M) is transformed into a greater quantity of money, and is thereby transformed into capital. Contrary to the prevailing neo-Ricardian interpretation, the initial givens in Marx's theory of surplus-value are not the physical quantities of the technical conditions of production and the real wage. Marx did not take these physical quantities as his initial givens and then derive constant capital and variable capital from these given physical quantities. Marx's question is not: how do given means of production and means of subsistence produce commodities that have a price greater than their cost? Marx's question is rather: how is the given quantity of money transformed into capital by increasing its magnitude? The neo-Ricardian interpretation attributes to Marx's theory the logical method of Sraffa's theory, i.e. the method of linear production theory. But Marx was writing 100 years before Sraffa and employed an entirely different logical method from Sraffa's linear production theory.

I offer the following arguments and textual evidence to support this monetary interpretation of the initial givens in Marx's theory of surplus-value:

> To begin with, the general analytical framework for Marx's theory of surplus-value is the circulation of capital, which as we have seen is expressed symbolically by the general formula for capital, M - C - M'. This general formula itself suggests that the starting-point of Marx's theory is M, the initial sum of money invested as capital to purchase means of production (constant capital) and labor-power (variable capital). The purpose of Marx's theory of surplus-value is to explain how this given initial sum of money is increased in magnitude through the purchase, production, and sale of commodities.

Secondly, my interpretation is further supported by the logical relation between Parts 1, 2, and 3 of Volume 1 of Capital. In Part 1, money is derived as the necessary form of appearance of the value of commodities. In Part 2, as we have seen, capital is defined in terms of this previously derived concept of money: as money that becomes more money, i.e. as M- C- M'. Part 3 then analyzes the origin of the increment of money that is characteristic of capital, with the initial money-capital taken as given. Marx did not suddenly in Part 3 ignore the prior logical development of money and capital in Parts 1 and 2 and introduce out of nowhere the technical conditions of production and the real wage as the initial givens in his theory. Instead, Parts 1 and 2 provide the logical presuppositions (the "givens") for Marx's theory of surplus-value in Part 3 and beyond.

The neo-Ricardian interpretation, on the other hand, has no explanation for Marx's analysis in Parts 1 and 2 or for the logical relation between these two parts and the theory of surplus-value in Part 3. These key parts of Volume 1 are simply ignored by this interpretation, and Marx's theory is turned into Sraffa's theory, starting with the technical conditions of production and the real wage.

As part of this analysis of the transformation of money into capital, Marx referred repeatedly to money as "the first form of appearance" of capital." In other words, Marx's analysis of the circulation of capital begins with money, the "first form of appearance" of capital, and with a specific quantity of money that is invested to purchase means of production and labor-power.

Marx never said anything like "the first form of appearance of capital is the means of production or the means of subsistence."

Another related aspect of the logical structure of the first three parts of Volume 1 is that Parts 1 and 2 are about the "sphere of circulation" and Part 3 begins Marx's analysis of the "sphere of production" (with the famous passage at the end of Part 2 about moving from the "noisy sphere of circulation" to the "hidden abode of production" marking the transition between these two stages of the analysis). Marx argued that, in his theory of capital, the analysis of circulation is a necessary prelude to the analysis of production because capital appears first in the sphere of circulation. Capitalist production is preceded by the investment of a given amount of money capital in the sphere of circulation proper. Marx's analysis of the sphere of circulation provides the logical presuppositions (the "givens') for his analysis of the second phase of the circulation of capital in the sphere of production. Again, the neo-Ricardian interpretation of Marx's theory completely ignores this initial phase of the circulation of capital in the sphere of circulation, and implicitly assumes that capital first appears, not in circulation, but in production, as the physical inputs to production. This is clearly not Marx's logical method in the first three parts of Volume 1. The initial quantities of money capital that provide the givens in Marx's theory of surplus-value come from circulation, not from production.

Thirdly, my interpretation is also supported by Marx's general methodological principle of "historical specificity", according to which the explanatory concepts of a theory of capitalism should refer to those features which are historically specific to capitalism, and should not refer to the general features which capitalist production shares with all form of social production (Korsch 1938, Chapter 2; Rosdolsky, pp. 77-80). Marx argued that these historically specific features are the determining factors in the development of capitalism, and therefore a theory of capitalism should focus on these determining factors (Marx, 1973; pp. 83-108). The technical conditions of production and the real wage are general features of social production, and thus cannot be the fundamental explanatory concepts of Marx's theory. On the other hand, the concept of money-capital refers to specific features of capitalism and is therefore a fundamental explanatory concept in Marx's theory.

Finally, my interpretation is also textually supported by the numerous passages throughout the various drafts of Capital in which Marx referred to the money-capital which initiates the circulation of capital as the "presupposed capital" or the "postulated capital" or the "starting point" or the "point of departure" for his analysis of the circulation of capital. These references are especially prominent in Chapter 4 of Volume 1 of Capital, and the earlier drafts of this chapter in the Grundrisse (Marx 1973, pp. 250-64) and in the "1861-63 Manuscript" (Marx and Engels 1987, pp. 501-07; Marx and Engels 1988, pp. 9-20). (This "second draft" of Capital has only recently been published in English and is very interesting.) There are also numerous similar passages in the "Results of the Capitalist Production Process" manuscript, published in the Penguin edition of Volume 1. One especially clear passage is the following:

> Here, where we are concerned with money only as the point of departure for the immediate process of production, we can confine ourselves to the observation: capital exists here as yet only as a given quantum of value = M (money), in which all use-value is extinguished, so that nothing but the monetary form remains...

If the original capital is a quantum of value = x, it becomes capital and fulfills its purpose by changing into $x + \Delta x$, into a quantum of money or value = the original sum + a balance over the original sum. In other words, it is transformed into the given amount of money + additional money, into the given value + surplus-value.

> ... As a given sum of money, x is a constant from the outset and hence its increment = 0. In the course of the process, therefore, it must be change into another amount which contains a variable element. Our task is to discover this component and at the same time to identify the mediations by means of which a constant magnitude becomes a variable one. (Marx 1977, pp. 976-77; emphases in the original)

Nowhere did Marx refer to the "presupposed means of production" or the "postulated means of production." Either Marx, who it should be remembered had a Doctorate degree in Philosophy and paid a great deal of attention throughout the various drafts of Capital to questions of logical method, was extremely sloppy in these many passages or Marx intended the usual methodological meanings to the terms "given," "postulated," "presupposed," etc., i.e. that they are the initial data with which his theory begins.

Therefore, I conclude that the logical arguments and the textual evidence to support my "monetary" interpretation of the initial givens in Marx's theory of surplus-value are much stronger than the arguments and the textual evidence to support the prevailing neo-Ricardian interpretation. Indeed, arguments and textual evidence are almost never presented to support the neo-Ricardian interpretation. This interpretation is simply asserted, and unfortunately accepted uncritically by most Marxists.

The initial money-capital that Marx took as given in his theory was assumed to be the objective "form of appearance" of abstract social labor. This function of money as the necessary form of appearance of abstract labor is the main conclusion of Marx's analysis of commodities and money in Part 1 of Volume 1. This important conclusion is then presupposed in the remainder of Capital, and in his theory of surplus-value in particular. Thus the aggregate money-capital taken as given in his theory of surplus-value, like any other quantity of money, is assumed to represent a definite quantity of abstract social labor. The precise quantity of abstract social labor represented by a given quantity of money depends on the value of money, which Marx also took as given (Marx 1977, pp. 214, 683).

The precise quantity of abstract labor represented by the given money constant capital is equal to $(C*v_m)$, where v_m is the given value of money. Similarly, the precise quantity of abstract labor represented by the given money variable capital, or the "necessary labor-time" required to produce the money equivalent of variable capital, is equal to $(V*v_m)$. These quantities of abstract labor represented by the constant capital and the variable capital will be equal to the labor-times embodied in the means of

production and the means of subsistence only if prices of the means of prodcution and means of subsistence are proportional to their respective labor-values, i.e. in general they will not be equal (more on this point below).

In the aggregate theory of surplus-value in Volume 1, the two initial givens constant capital and money capital play entirely different roles in the determination of the aggregate price of commodities and thus in the determination of the aggregate amount of surplus-value. The quantity of constant capital becomes one component of the aggregate price of the output. In other words, the constant capital is "transferred" to the price of the output. The amount of value transferred from the constant capital to the price of the output cannot be greater than the value of the constant capital. Hence the constant capital component of the price of commodities cannot be a source of surplus-value. On the other hand, the variable capital does not become a component of the price of the output. Instead, the variable capital is replaced by current labor, and this current labor produces new-value, which becomes the second component of the price of the output. This new-value component of the price of commodities both replaces the variable capital invested in labor-power and provides the surplus-value of capitalists.

Marx's theory of the determination of the aggregate price of commodities can thus be summarized algebraically by the following equations:

(1) $P = C + MVA$

(2) $MVA = mL$

where P represents the aggregate price of commodities, C the constant capital, MVA the money value added produced by current labor, L the quantity of current abstract labor, and m is the "monetary expression of value," or the rate at which current abstract labor produces new-value per hour (which is equal to the inverse of the value of money and was taken as given by Marx; e.g. 0.5 shillings per hour). The givens in this theory of aggregate price are: C, m, and L. Note that the first component of the price of commodities, the "value transferred" from the means of production to the price of the product, is equal to the given money constant capital consumed in the production of the commodities, whether or not this money constant capital is proportional

to the labor-time embodied in the means of production (more on this point below).

From this theory of aggregate price, Marx derived the aggregate amount of surplus-value (S) produced within a given period of time. This derivation may be briefly summarized algebraically as follows:

(3) $S = P - K$

$= (C + MVA) - (C + V)$

$= MVA - V$

$= mL - mL_n$

$= m(L - L_n)$

(4) $S = mL_s$

where K represents the cost price of commodities (= C + V), L_n the necessary labor-time or the time required for current labor to reproduce the equivalent of variable capital (= V/m), and L_s the surplus-labor time.

The main points about this derivation for our purposes are the following: (1) the givens in this theory are C, V, L, and m, as discussed above; (2) the aggregate amount of surplus-value is derived as a function of the aggregate amount of surplus-labor; and (3) this aggregate amount of surplus-value is then taken as given in Marx's subsequent analysis of the distribution of surplus-value and prices of production in Volume 3 of Capital, to be discussed below.

In the above theory, the given quantities of money constant capital and money variable capital are assumed to be identically equal to the price of the means of production and the price of labor-power, respectively. Whether or not constant capital and variable capital are proportional to the labor-time embodied in the means of production and the labor-time embodied in the means of subsistence depends on whether or not the prices of the means of production and means of subsistence are proportional to their respective laobr-values. Marx provisionally assumed in Volume 1 that the prices of the means of production and the means of subsistence are proportional to their respective labor-values, because there was no basis for any other assumption consistent with the labor theory of value, since the determination of individual commodities, or subsets of commodities such as the means of production and means of subsistence, are not considered in Volume 1. Strictly speaking, this exact proportionality between price and labor-time applies only to the aggregate commodity product. However, this provisional assumption plays no essential role in Marx's theory of surplus-value in Volume 1. The magnitudes of constant capital and variable capital are not DETERMINED as the labor-times embodies in the means of production and means of subsistence; i.e. they are not DERIVED from given means of production and means of subsistence. The physical quantities of means of production and means of subsistence play no role in Marx's theory of surplus-value. Instead, the magnitudes of constant capital and variable capital are TAKEN AS GIVEN ("presupposed") as the quantities of money-capital that initiate the circulation of capital. The constant capital transferred to the price of the output is equal to the money used to purchase the means of production, whether or not this money constant capital is proportional to the labor-times embodied in the means of production. Similarly, surplus-value is equal to the difference between the new-value produced and the variable capital used to purchase labor-power, whether or not this money variable capital is proportional to the labor-times embodied in the means of subsistence.

b. Theory of prices of production

As discussed above, the main subject of Volume 3 is the division of surplus-value into individual component parts and among individual capitalists. In other words, Volume 3 is concerned with the distribution of surplus-value, as subsequent to the production of surplus-value. Part 2 of Volume 3 analyzes the distribution of surplus-value among the individual branches of production and Parts 4-6 analyze the further division of surplus-value into industrial profit, merchant profit, interest, and rent. In this analysis of the distribution of surplus-value, the total amount of surplus-value is taken as given, as determined in the prior analysis of capital in general in Volume 1 (see Moseley 1997a and 1998).

The "transformation problem" is of course concerned with the distribution of surplus-value among individual branches of production. Since the distribution of surplus-value among branches of production is accomplished by means of the prices of production of individual commodities, this aspect of the distribution of surplus-value

necessarily involves the determination of these individual prices of production. In this analysis of individual prices of production, the general rate of profit is taken as given, as determined by the prior analysis of capital in general in Volume 1, and as equal to the total surplus-value divided by the total social capital.

Also taken as given in Marx's theory of prices of production are the same quantities of constant capital and variable capital that are taken as given in his theory of surplus-value in Volume 1. The only difference is that in Volume 3, not only are the aggregate quantities of constant capital and variable capital are taken as given, but also the disaggregate quantities of these two components of money- capital for each industry (the sum of the latter is obviously equal to the former). This is the key reason why constant capital and variable capital do not change, or do not have to be transformed, in the transition from the aggregate analysis of surplus-value in Volume 1 to the disaggregate analysis of prices of production in Volume 3 - because the same quantities of constant capital and variable capital are taken as given in both of these stages of the analysis. The magnitudes of constant capital and variable capital are not first determined as the values of the means of production and the means of subsistence, and then later transformed into the prices of these same means of production and means of subsistence, as in the neo-Ricardian interpretation. In his theory of prices of production, Marx did not suddenly adopt a different logical method, and take the physical quantities of means of production and means of subsistence as his initial givens. Instead, he continued to take as given the same quantities of money-capital used to purchase the means of production and labor-power that he took as given in Volume 1, except in disaggregate quantities. These given quantities of money capital "remain invariant" in the transition from the aggregate theory of surplus-value to the disaggregate theory of prices of production.

The sum of constant capital and variable capital is defined by Marx as the "cost price" of commodities, i.e. k = c + v. "Cost price" is a key concept in Marx's theory of prices of production, and is introduced in Chapter 1 of Volume 3 in order to lay the necessary groundwork for the theory of prices of production presented in Part 2. Since, as we have seen above, constant capital and variable capital are defined in terms of money, their sum, the cost price of commodities, is also defined in terms of money, not in terms of labor-time. This cost price is referred to in Chapter 1 and in earlier drafts of this chapter as the money capital "presupposed" or "postulated" in the first phase of the circulation of capital. "Profit" is also defined by Marx in this same Chapter 1 of Volume 3 as the excess of the money realized at the end of the circulation of capital over and above the "presupposed" cost price. In the more Hegelian language of the Grundrisse, Marx defined profit as "the presupposed capital, relating to itself" (G. 762, emphasis added). In the earlier draft of Chapter 1 in the 1861-63 manuscript, Marx explicitly made the connection between the initial money capital M taken as given in his theory of surplus-value and the cost price k taken as given in this theory of prices of production, both of which are equal to the sum of constant capital and variable capital, M for the total economy and k for each industry. Marx commented:

> We have seen that the general form of capital is M-C-M'. In other words, money, an amount of value, is thrown into circulation in order to extract from it a larger amount. ...
>
> We now return, therefore, to the point of departure from which we proceeded in considering the general form of capital. ...
>
> Profit therefore = the excess of value of the product or rather the amount of money realized in circulation for the product ... above the value of the capital which entered the formation of the product. (Marx and Engels 1991 , pp. 78-81)

Marx then defined the "value of the capital which entered the formation of the product" as the "cost of production" of the commodity, which is the term Marx was using at this time for what he later called the "cost price", i.e. the sum of constant capital and variable capital.

Therefore, Marx's theory of prices of production of commodities can be summarized algebraically by the following equation (see Marx 1981, p. 265):

(5) $$p_i = k_i + r\,k_i$$

where p_i stands for the price of production of each commodity, k_i for the cost price of commodities in each industry (equal to the sum of constant capital and variable capital), and r for the general rate of profit (ignoring here the distinction between the stock and flow of capital). In this equation, k_i is taken as given sums of money, as the initial presuppositions of Marx's theory, and r is taken as given as determined by the prior analysis of capital in general in Volume 1.

This determination of prices of production is quite simple and straightforward. And it is fundamentally different from the neo-Ricardian interpretation of Marx's theory, according to which prices of production are determined simultaneously with the rate of profit, and both are derived from given technical conditions and the real wage, according to the well known equation:

(6) $$p = (1 + r)\,(pA + pBL)$$

where A is the given input-output matrix (the technical conditions of production) and B is the given vector of wage-goods. A and B, defined in terms of physical quantities of goods, play no role in Marx's theory of prices of production expressed by equation (1) above.

I have shown in Moseley (1993) that, if this interpretation of Marx's logical method is accepted, then the following conclusions follow: (1) Marx's theory of prices of production is not "incomplete", i.e. Marx did not fail to transform the inputs of constant capital and variable capital from values into prices of production. Instead, in Marx's theory of prices of production, constant capital and variable capital are taken as given as sums of money, which are assumed to be equal to the prices of production of the means of production and labor-power, respectively. Constant capital and variable capital do not have to be transformed from value magnitudes to price magnitudes because constant capital and variable capital are not determined first as the value of the means of production and wage-goods and then later determined as the price of these given bundles of goods. Instead, the same quantities constant capital and variable capital are taken as given sums of money, in both the Volume 1 aggregate analysis of surplus-value and the Volume 3 disaggregate analysis of prices of production, regardless of whether or not the prices of the means of production and wage-goods are proportional to their values. (2) Marx's two aggregate equalities (total price = total value and total profit = total surplus-value) are both true simultaneously, as Marx himself concluded. (3) The rate of profit does not change as a result of the determination of prices of production. Instead, the rate of profit is taken as given in Marx's theory of prices of production, as determined in the prior aggregate analysis of capital in general in Volume 1. (4) The labor theory of value is not "redundant" because values and prices of production, as

defined by Marx, cannot be derived from the technical conditions of production and the real wage.

2. FOLEY'S "NEW SOLUTION" INTERPRETATION

The version of the "new solution" most similar to my "macro-monetary" interpretation is that presented by Duncan Foley (1982, 1986). Foley's interpretation is similar to my interpretation, first of all, in its general emphasis on money and the monetary nature of Marx's theory. Foley emphasizes that the general analytical framework of Marx's theory is the monetary circuit of capital, represented by the familiar formula M - C ... P ... C' - M'. This circulation of capital corresponds to the flows of money capital which are recorded in the bookkeeping accounts of capitalist enterprises.

> A capitalist firm begins with value in money form and uses it to buy commodities, which are combined in production to yield a new commodity, one that is sold for more money than the capitalist advanced to begin with. Marx represents this motion in the diagram M - C ... P ... C' - M'... This diagram of capitalist circulation corresponds directly to the income, or profit and loss statement, of a capitalist firm. (1986, p. 33)

Consistent with this emphasis, Foley defines the key variables in Marx's theory of surplus-value - constant capital, variable capital, value added and surplus-value - in terms of money, as the flows of money capital within the general framework of the circulation of capital (1982, p, 38; 1986, Chapter 3). Foley also defines the key variables in Marx's theory of prices of production - profit and prices of production - in terms of money (1982, p. 40; 1986, Chapter 6).

Another important similarity between Foley's interpretation and my interpretation is its general emphasis on the methodological principle of the prior determination of aggregate magnitudes. Foley expresses this point as follows:

> In this paper I suggest ... viewing the labor theory of value as the claim that the money value of the whole mass of the net production of commodities expresses the expenditure of the total social labor in a commodity-producing economy ... This path begins with the global value produced by the expenditure of labor, the value embodied in the whole mass of the net commodity product, and then asks how this value comes to be realized in the prices of particular commodities. The concept of value as a property of the whole mass of the net commodity product in this approach is <u>analytically prior</u> to the concept of price, the amount of money a particular commodity brings on the market. (1982, p. 37; emphasis added).

In (1986), the first chapter on Marx's method emphasizes that the fundamental determinations of capitalism are the aggregate magnitudes of the system as a whole and that these magnitudes are "conserved" in the more concrete stages of the analysis. And in Chapter 3, Marx's theory of surplus-value in Volume 1 of <u>Capital</u> is presented as a theory of the total amount of surplus-value produced in the capitalist economy as a whole.

Another important similarity is that Foley's interpretation assumes that <u>variable capital it taken as given in terms of money</u>, as the money wage paid to workers, rather than derived from a given quantity of wage goods, as in the neo-Ricardian interpretation. This given quantity of money variable capital remains invariant in the transition from the theory of surplus-value in Volume 1 to the theory of prices of production in Volume 3, as in my interpretation.

Foley's justification for this interpretation of variable capital is not presented in terms of Marx's general logical method, or the general nature of the givens in Marx's theory, but is instead based on the specific nature of the relation between capitalists and workers in capitalist society. It is argued first of all that taking variable capital as given in terms of the money wage is a more accurate representation of the actual exchange relation between capitalists and workers.

> Workers in capitalist society do not bargain for, or receive, a bundle of commodities as payment for the labor power, they receive a sum of money, the money wage, which they are then free to spend as they wish ... (1982, p. 43)

Foley also argues that this interpretation also provides a better understanding of the specific nature of exploitation in capitalism and of the nature of the class struggle between capitalists and workers. He argues that this interpretation enables one to perceive that capitalist exploitation is not identical with the existence of a surplus product and that the goal of workers' struggles should not be the elimination of the surplus product per se, but should instead be the elimination of the social relations of capitalism in which the surplus product is appropriated by capitalists in the form of surplus-value.

However, and here is where our differences begin, Foley's interpretation treats constant capital differently from variable capital, and hence treats constant capital differently from my own interpretation. Constant capital is not taken as given in terms of money, as the quantity of money used to purchase means of production, as in my interpretation. Instead, constant capital is derived from given physical quantities of means of production, as in the neo-Ricardian interpretation. As a result, constant capital changes in the transition from the theory of surplus-value in Volume 1 to the theory of prices of production in Volume 3. In Volume 1, constant capital is equal to the value of the given means of production, and in Volume 3, constant capital is equal to the price of production of the same given means of production.

Therefore, I argue that there is a key methodological inconsistency in Foley's interpretation between the determination of constant capital and the determination of variable capital. Variable capital is taken as given in money terms, but constant capital is derived from given physical quantities. Foley does not provide a rationale for this inconsistent treatment of constant capital and variable capital. I argue that because constant capital and variable capital are specific forms of the general concept of capital, and are the two components of the initial money capital (M), they should both be determined in the same way. Either they should both be taken as given in terms of money or they should both be derived from given physical quantities. Similarly, constant capital and variable capital are the two components of the cost price of commodities in Marx's theory of prices of production, suggesting again that they should be determined in the same way. Marx often wrote or expressed the determined the equation for the determination of prices of production as the sum of the cost price plus the average profit (k + rk), thereby leaving no possibility for different determinations of the two components of the cost price, constant capital and variable capital. Nowhere in Marx's writings is there a suggestion that constant capital and variable capital are determined in different ways, I have argued above that there are strong reasons for assuming that constant capital and variable capital should be taken as given, as the two components of the money capital (M) or the cost price (k) that initiates the circulation of capital.

In one passage, Foley seems to suggest that Marx took as given the entire money capital invested in capitalist enterprises - both the constant capital and the variable capital - rather than deriving these components of capital from given physical quantities.

> One striking difference between Marx's treatment of the problem and later treatments is that Marx describes the two economies solely in terms of the accounts of the capitalist firms; he does not specify the actual production and distribution of use-values. Later treatments, perhaps in the name of theoretical rigor, describe both economies in terms of the production and distribution of particular use-values, and derive the accounts of the capitalist firms from this assumed data on production and distribution. when one holds constant the production and distribution of use-values, it turns out that ... aggregate value added and aggregate profit cannot both be the same in the two [economies].

I want to suggest that Marx had good theoretical reasons for describing the two economies in terms of the accounts of the capitalist firms rather than in terms of the production and distribution of use-values. The social facts relevant to struggle and change in a capitalist society concern the production and distribution of value itself, and the actual production, distribution, and consumption of use-values that follow form these struggles take a secondary place. (1982, p. 44; first emphasis added)

It seems to me that Foley's argument could be applied to constant capital as well as to variable capital. However, Foley applies this argument only to variable capital, thus resulting in the inconsistent treatment of constant capital and variable capital.

Foley's inconsistent treatment of constant capital and variable capital leads him to the following erroneous conclusions regarding Marx's theory of prices of production, which will be discussed further below: (1) Marx made a partial error in his determination of prices of production in Volume 3. Contrary to the standard interpretation, Marx did not fail to transform variable capital, because the same variable capital is taken as given in money terms in both Volume 1 and Volume 3. However, as in the standard interpretation, Marx did fail to transform constant capital, because constant capital is derived from given means of production, first as the value and then as the price of production of these given means of production. (2) The total price of commodities also changes from Volume 1 to Volume 3, so that the total price is no longer equal to the total value of commodities. (3) The rate of profit also changes from Volume 1 to Volume 3, i.e. the "price" rate of profit is not equal to the "value" rate of profit.

Another important difference between Foley's interpretation and my interpretation is the nature of the determination of the rate of profit, just mentioned. Foley agrees with the neo-Ricardian interpretation that there are two rates of profit in Marx's theory - the "value" rate of profit determined in Volume 1 and the "price" rate of profit determined in Volume 3 - and that these two rates of profit are in general not equal, so that the rate of profit changes as a result of the transformation of values into prices of production. Foley also agrees with the neo-Ricardian interpretation that the "price" rate of profit is determined simultaneously with prices of production, and is derived from the given physical quantities of the technical conditions of production and the real wage. In contrast, I have argued above that there is only one rate of profit in Marx's theory - the "price" rate of profit - and that this rate of profit is determined prior to the determination of prices of production by the analysis of capital in general. Foley provides no justification for his interpretation, presumably because this interpretation has been the generally accepted interpretation. However, in my view, Foley has accepted the erroneous neo-Ricardian interpretation on this crucial point.

It also seems to me that the simultaneous determination of the rate of profit is inconsistent with the general methodological principle emphasized by Foley of the prior determination of aggregate magnitudes. According to Foley, the prior determination of aggregate magnitudes applies only to the following magnitudes: value added, variable capital, and surplus-value. It does not apply to the following other variables: total price, constant capital, and the rate of profit. Instead, these latter variables are determined simultaneously with individual prices of production.

It seems to me that this is another important methodological inconsistency in Foley's interpretation.

Another difference between Foley's interpretation and my interpretation is that Foley redefines the aggregate price-value equality which Marx emphasized from the gross price of commodities to the net price of commodities, or the value added component of the gross price of commodities. Foley assumes that the aggregate net price-value equality is satisfied, i.e. it is assumed that the aggregate value added (after the determination of prices of production) is proportional to the total current labor. In his system of equations that determine prices of production, this aggregate net price-value equality is the (n+1) equation; it is assumed as a "conservation principle" or an "invariance postulate". This invariance postulate is essentially an expression of the methodological principle of the prior determination of aggregate magnitudes. It is assumed that the aggregate value added is determined Volume 1 and is taken as given in the determination of prices of production in Volume 3. The determination of prices of production affects only the distribution of this given, predetermined amount of the aggregate value added.

From this assumption, and the assumption discussed above that variable capital is taken as given as the money wage and remains invariant in the transformation, the other aggregate equality - that the aggregate profit is equal to the aggregate surplus-value - follows as a matter of simply algebra. However, according to Foley's interpretation, the aggregate gross price-value equality will in general not be satisfied because the constant capital component of the gross price of commodities will in general not be equal to the labor time embodied in the means of production.

Foley's justification for this redefinition of the aggregate price equality seems to be that what is most important in Marx's theory is the relation between value added and current labor, because surplus-value is one part of the value added. This is the key relation that is assumed to be invariant in the transformation. The relation between the gross price and the total labor is much less important.

I agree in part with Foley's argument on this point. I agree that the most important point of Marx's labor theory of value is that value added is determined by current labor. I also agree that the aggregate value added remains invariant in the transformation and that the aggregate net price-value equality will be satisfied simultaneously with the aggregate profit-surplus value equality. However, I also argue (as above) that constant capital is determined in the same way as variable capital and therefore is determined in a different way from Foley's interpretation. Constant capital is not derived from given means of production, but is instead taken as given in terms of money and remains invariant in the transformation, just like variable capital. On the 7basis of this interpretation of constant capital, the aggregate gross price-value equality is also satisfied simultaneously with the aggregate profit-surplus value equality, as Marx concluded, and as has been shown above.

In sum, the most important difference between Foley's interpretation and my interpretation is the nature of the determination of constant capital. According to my interpretation, constant capital is determined in the same way as variable capital - both

are taken as the given quantities of money capital that initiate the circulation of capital. According to Foley's interpretation, constant capital is determined differently from variable capital. Variable capital is taken as given as a quantity of money capital, as in my interpretation, but constant capital is derived from given physical means of production, as in the neo-Ricardian interpretation. Thus, I argue that Foley only goes "half way" in breaking away from the neo-Ricardian "physical quantities" interpretation of Marx's theory. If Foley were to accept my interpretation of constant capital, it appears that all the other differences between our two interpretations would disappear. We could then agree that: (1) Marx's theory of prices of production in Volume 3 is logically complete and consistent (i.e. Marx did not commit a "logical error", even a partial one, in the determination of prices of production); (2) the rate of profit would not change as a result of the determination of prices of production; and (3) the aggregate gross price-value equality is also satisfied simultaneously along with the aggregate net price-value equality and the aggregate profit-surplus value equality, as Marx concluded. These conclusions are more consistent than Foley's prior conclusions with the important methodological presuppositions discussed in the beginning of this section: the monetary nature of Marx's theory and the prior determination of aggregate magnitudes.[184]

3. DUMÉNIL'S "NEW SOLUTION" INTERPRETATION

The next version of the "new solution" to be considered is that presented by Gerard Duménil (1980, 1983-84, 1986).[185] Duménil's interpretation is similar to Foley's in the following general respects: (1) Duménil also takes the money wage as an initial given, rather than the real wage; (2) Duménil also redefines the aggregate price-value equality from gross to net terms; and (3) Duménil also argues that Marx made a partial error in his determination of prices of production. Duménil also comes to essentially the same conclusions as Foley: that the aggregate net price-value equality is satisfied simultaneously with the aggregate price-surplus value equality, but the aggregate gross price-value equality is not satisfied, and that the rate of profit changes in the determination of prices of production.

There are also several differences in the details between Duménil's and Foley's interpretations and one substantial difference of interpretation. I will begin with the small differences and end with the more substantial difference.

One difference of detail is that Duménil's justification for taking the money wage rather than the real wage as an initial given is somewhat different from Foley's. Duménil presents similar justifications as Foley - that capitalists actually pay workers a money wage (not a real wage) and that capitalist exploitation should be defined in relation to this money wage (not in relation to the real wage). In addition, Duménil also presents additional arguments for taking the money wage as given and for the different methods of determination of constant capital and variable capital. To begin with, Duménil argues:

> In contrast with what is often contended, Marx does not treat constant and variable capital identically. Indeed, it is true that the capitalists buy constant capital, and the price of production must be used to evaluate this transaction. But capitalists do not buy the consumption goods of workers, but pay them wages. (1986, pp. 15-16)

This argument is very brief and seems to be missing several steps, but the argument seems to be that, because capitalists directly buy means of production and do not directly means of subsistence, constant capital must first be evaluated as the value of the means of production and then transformed into the prices of production of these means of production. On the other hand, because capitalists do not buy means of subsistence directly, but rather pay workers money wages, variable capital is both initially and finally evaluated in terms of the money wage, or prices of production.

But this argument is a non-sequitur. The fact that capitalists buy means of production directly does not mean that constant capital must be derived from given means of production, first as their value and then as their prices of production. Capitalists just as surely pay money to purchase means of production as they pay money workers to purchase their labor-power. Constant capital could also be taken as given as this sum of money capital paid by capitalists to purchase means of production, just as variable capital is taken as given as the sum of money capital paid by capitalist to purchase labor-power. Indeed, as argued above, there are good reasons in favor of such a consistent, parallel determination of constant capital and variable capital. Since both constant capital and variable capital are specific forms of the general concept of capital, they should both be determined in the same way, and, specifically, they should be taken as given as the two components of the initial money capital (M) that begins the circulation of capital.

Duménil then presents the following textual evidence to support his interpretation:

> This fundamental difference is quite explicitly expressed in Capital. Concerning constant capital, Marx writes:
>
> "The development given above also involves a modification in the determination of a commodity's cost price. It was originally assumed that the cost price of a commodity equaled the value of the commodities consumed in its production.
>
> But for the buyer of a commodity, it is the price of production that constitutes its cost price and thus enters into forming the price of another commodity. (...)
>
> Our present investigation does not require us to go into further details on this point." (Marx 1981, pp. 264-65)
>
> However, concerning variable capital, the discussion is quite different ...:
>
> "As for variable capital, the average daily wage is certainly always equal to the value product of the number of hours that the worker must work in order to produce its necessary means of subsistence; but this number of hours is itself distorted by the fact that the production prices of the necessary means of subsistence diverge from their values." (Marx 1981, p. 261)

The first passage above is interpreted by Duménil to be only about constant capital. But this interpretation is incorrect. The passage is about the cost price of commodities.

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184. Another important aspect of Foley's interpretation is the "value of money" or its inverse the "monetary expression of value." I am still not clear on exactly how the value of these values is determined, according to Foley's interpretation, and I hope that the discussion in Washington can clarify this point. The difference between Foley and me on this issue could be very significant, or not significant at all, depending on this clarification.

Aside from the issue of the method of determination, Foley defines the monetary expression of value as equal to the ratio of money value added to current labor. This definition of the monetary expression of value is consistent with my equation (2) above (in which the monetary expression of value is taken as given). Also, according to my interpretation, this same monetary expression of value is also equal to the ratio of total price to total labor, where total labor is defined as the sum of living labor and quantity of abstract labor represented by the money constant capital (= C/m, as discussed above), but would not be equal to the "total" ratio if total labor were defined as the sum of current labor and the labor-time embodied in the means of production.

185. Lipietz (1982) presents essentially the same interpretation as Duménil, with more mathematical formalization and fewer supporting arguments.

We have seen above that cost price is defined by Marx in Chapter 1 of Volume 3, and used consistently throughout, as the sum of both constant capital and variable capital. It is true that this passage mentions specifically only the means of production (in a part not explicitly quoted by Duménil) and does not mention the means of subsistence. However, in several other similar passages in which Marx discussed the "modified significance of the cost price," both constant capital and variable capital are explicitly mentioned (Marx 1981, pp. 261 and 308-09; Marx 1971, p. 167).[186] Therefore, these passages are about the cost price, which is the sum of both constant capital and variable capital, and whatever interpretation applies to constant capital also applies to variable capital. Either they are both taken as given as quantities of money capital or they are both derived from given physical quantities. These passages are certainly not arguments for different determinations of constant capital and variable capital.

I argue that this and the other similar passages cited above do not say or imply that the constant capital and the variable capital are first determined as the value of the means of production and the means of subsistence and then are then later have to be transformed into the prices of production of these given physical quantities of goods. Rather, this passage says that, although it was originally assumed that the prices of the means or production and the means of subsistence are equal to their respective values (as discussed in the first section above), this provisional assumption has nothing to do with the determination of constant capital and variable capital. Constant capital and variable capital are taken as given as the quantities of money used to purchase means of production and means of subsistence, whether or not the price of these means of production and means of subsistence are equal to their values. Once it is determined that the prices of the means of production and means of subsistence are in general not equal to their values, this does not change the magnitude of the given constant capital and variable capital. Nor is the quantity of surplus-value affected, which remains the excess of the price of commodities over their cost price, or over the sum of the given quantities of constant capital and variable capital.

My interpretation is supported by the continuation of the first passage quoted by Duménil above:

> For even if a commodity's cost price may diverge from the value of the means of production consumed in it, this error is the past is a matter of indifference to the capitalist. The cost price is a given precondition, independent of his, the capitalist's, production, while the result of his production is a commodity that contains surplus-value, and therefore an excess value over and above its cost price.
>
> (Marx 1981, p. 265)

Thus we see that, even if the cost-price of the means of production and the means of subsistence are not equal to their values, this cost-price is still taken as given (a "given precondition") in Marx's theory of surplus-value, and surplus-value is still the excess of the price of the product over this given cost-price.

The second passage above quoted by Duménil (Marx 1981, p. 261) also does not support his interpretation that variable capital is determined differently from constant capital. The paragraph quoted by Duménil begins as follows:

> Apart from the fact that the price of the product of capital B, for example, diverges from its value, because the surplus-value realized in B is greater or less than the profit added in the price of the products of B, the same situation also holds for the commodities that form the constant part of capital B, and indirectly, also, its variable capital, as means of subsistence for the workers. As for the constant part of capital is concerned, it is itself equal to cost price plus surplus-value, i.e. now equal to cost price plus profit, and this profit can again be greater or less than the surplus-value whose place it has taken. (emphasis added)

This passage then continues with the part quoted by Duménil (and above)

> As for the variable capital ... (emphasis added)

We can see that constant capital is discussed in a completely parallel fashion in the sentences immediately prior to the sentences on variable capital quoted by Duménil. Marx is not suggesting in this paragraph that constant capital and variable are determined differently. Rather, he is saying that both the constant capital and the variable capital, as the two components of the cost price, are now seen to be equal to the price of production of the means of production and the means of subsistence, rather than to the values of these goods, as originally assumed. However, as already discussed, these inequalities do not affect the determination of either constant capital and variable capital. Both of these components of the cost price continue to be taken as "given preconditions", as the sums of money capital consumed in the production of commodities.

Duménil also provides additional arguments for taking the money wage as an initial given, rather than the real wage. Duménil argues that if the real wage is taken as given, as in the neo-Ricardian interpretation, then: (1) it is necessary to assume that all workers consume the same goods; (2) the magnitude of surplus-value is affected by whether or not workers save; and (3) the rate of profit depends only on the conditions of production in basic goods industries, and does not depend on the conditions of production in luxury goods industries, which is contrary to Marx's theory. I agree in general with all three of these additional arguments for taking the money wage as given. However, these arguments do not imply that constant capital should be determined differently, i.e. should be derived from given means of production. I have presented above substantial general methodological arguments and textual evidence to support the interpretation that constant capital and variable capital should be determined in consistent, parallel fashion, and that both should taken as given as the two components of the money capital (M) that initiates the circulation of capital. Duménil's more specific arguments relating to variable capital do not negate these general arguments for the parallel determination of constant capital and variable capital in terms of given quantities of money capital, but rather reinforce these more general arguments in the specific case of variable capital.

Another minor difference between Duménil and Foley is that Duménil provides an additional argument to support the redefinition of the aggregate price-value equality from gross to net terms, besides the general argument emphasized by Foley that the relation between value added and current labor is the most important aspect of Marx's labor theory of value. The additional argument is that the gross price-value equality involves "double-counting." The argument seems to be that, as an expression or measure of current labor, the gross price of commodities involves "double-counting". This statement is clearly true. However, this obvious statement does not alter the fact that Marx presented a theory of the gross price of commodities, not just a theory of the net price of commodities, and that Marx clearly stated many times that the gross price-value equality is satisfied simultaneously with the profit-surplus value equality. I have shown above that, if constant capital is taken as given as the money expended to

[186] Marx (1981, p. 161) is the second passage quoted by Duménil above and will be discussed below.

purchase means of production, as I argue Marx did, then Marx's conclusion regarding the gross price-value equality is correct.

Duménil acknowledges Marx's many statements of the gross price-value equality, but he argues that Marx was confused in these passages, because he had not yet written Volume 2, and in particular had not written Part 3 of Volume 2 on the reproduction schemes (1983-84, p. 449; 1986, p. 43). According to Duménil, the main point of the reproduction schemes was to clarify the distinction between the gross price and the net price of commodities. If Marx had written Volume 3 with this clarity in mind, he would have emphasized the net price-value equality, instead of the gross price-value equality.

In a sense, I agree that the main point of the reproduction schemes was to clarify the distinction between the gross price and the net price of commodities. However, the more specific point was essentially the opposite of what Duménil suggests. The reproduction schemes are primarily a critique of "Smith's dogma," according to which the entire gross price of commodities "can be entirely resolved into revenue," i.e. into wages plus profit plus rent, or into the value added or the net price of commodities. Marx argued that Smith's dogma ignores the constant capital component of commodities. If Smith's dogma were true, then it would mean that capitalists would not be able to recover the constant capital consumed in the production of commodities, and hence would also not be able to repurchase and replace the consumed means of production. Therefore, Marx's analysis of the reproduction schemes emphasizes that the reproduction of capital cannot be analyzed solely in terms of the value added (or "revenue") component of the price of commodities, but must instead by analyzed in terms of the gross price, including the constant capital component. (See Moseley 1997b for an extensive discussion of Marx's reproduction schemes and Smith's dogma.)

This main point of the reproduction schemes was already clearly in Marx's mind when we was writing Volume 3 in 1864. Marx had first developed these ideas during the early stages of the 1861-63 manuscript, while writing about Smith (Sections 8-10 of Chapter 3 of what we know as Volume 1 of Theories of Surplus-value). In a very interesting and important letter written by Marx to Engels in July of 1863, Marx presented his first sketch of the reproduction schemes. In this letter, Marx explicitly stated and emphasized that the main point of the reproduction schemes was to refute "Smith's dogma." Therefore, Marx's analysis of the reproduction schemes provided no reason for him to change his many statements regarding the gross price-value equality to statements regarding the net price-value equality. If anything, this analysis provides additional reason for continued emphasis on the gross price equality.

Finally, we come to the most important difference between Duménil's and Foley's interpretations. Unlike Foley, who argues that the key concepts in Marx's theory (constant capital, variable capital, surplus-value, profit, prices of production, etc.) are defined in units of money, Duménil argues that these concepts, even including the Volume 3 concepts of profit and "prices" of production, are defined in units of labor-time. Duménil argues that Marx's analysis of prices of production has to do with the reallocation of social labor, which is a different process altogether from the expression of social labor-times as prices (1986, Chapter 1, "Reallocated values and prices of production"; 1983-84, pp. 436-41). "Prices" of production are defined as "redistributed labor-times", i.e. as the labor-times distributed to individual branches of production according to the equal profit rate rule, as opposed to labor-times distributed according to the surplus-value produced rule. Profit is defined as the "surplus labor" that is received in each branch of production according to the equal profit rate rule. Constant capital and variable capital are also defined in units of labor-time; constant capital as the labor-time embodied in the means of production and variable capital as the labor-time represented by the money wage.

This aspect of Duménil's interpretation obviously raises very important and fundamental issues, a full discussion of which is clearly beyond the scope of this paper. However, I argue that this is a fundamental misinterpretation of Marx's theory and of the concepts in Marx's theory. I have presented above a very different interpretation, which emphasizes that the key concepts of Marx's theory are defined in terms of money, starting with the concept of capital which is defined as money that becomes more money. I have argued that Volume 3 is mainly about the distribution of the total amount of surplus-value (or the total increment of money) that has already been determined by the analysis in Volume 1. Part 2 is about the distribution of this total increment of money across individual branches of production by means of price of production. Price of production is the sum of the cost price of commodities and the average profit. Cost price and profit are clearly defined in Chapter 1 of Volume 3 in terms of money, and their sum, the price of production of commodities is also clearly defined in Chapter 9 in terms of money.

Parts 4-6 of Volume 3 then analyze the further distribution of the total increment of money into the component parts of industrial profit, commercial profit, interest, and rent. All these components of surplus-value are clearly defined in terms of money. A part of the increment of money that is received in each branch of production has to be "shared" with commercial capital and with creditors as interest. In agriculture, a part of this increment of money has to be shared with landlords as rent. To define prices of production and profit in terms of labor-time is to miss completely the phenomena that Marx was trying to explain in Volume 3 (the distribution of the total increment of money) and to lose the connection between Part 2 and the rest of Volume 3. If the variables in Part 2 are defined in units of labor-time, but the variables in the remaining parts are defined in units of money, then there must be a key logical transition from the labor-time variables in Part 2 to the money variables in the rest of Volume 3. But there is no evidence of such a key logical transition.[187]

Duménil argues that his interpretation is supported by the fact that Marx's numerical examples in Chapter 9 of Volume 3 refer to labor-times and not to money (1983-84, p. 440; 1986, pp. 15-16) It is true that in Chapter 9, Marx did not explicitly state that his numerical examples are in units of money. However, he also did not state explicitly that his numerical examples are in units of labor-time. (Duménil provides no specific references). Therefore, these numerical examples do not necessarily support Duménil's interpretation. Marx simply did not bother to specify his units in this particular draft.

[187.] Part 7 of Volume 3 ("Revenue and Its Sources") is a kind of summary of Volume 3. The main point of Part 7 is that, once surplus-value is divided into these different individual parts (profit, interest, rent, etc.), then these individual parts appear to capitalists and to economists as separate and independent "sources" of value and surplus-value. Marx illustrated his analysis throughout Part 7 with numerical examples in which all the variables are expressed in terms of money. One of the individual parts into which surplus-value is divided in profit. If profit were defined in units of labor-time and the other variables in units of money, then these examples, and indeed the entire discussion in Part 7, would make no sense.

However, in Chapter 9, Marx explicitly defined price of production in terms of prices, not in terms of labor-time, as the sum of the cost price and the average profit, both of which are clearly defined in units of money. Furthermore, in two other drafts of his theory of prices of production, Marx did specify that the units of all the variables involved are money (Marx 1968, pp. 65-69 and Marx and Engels 1975, pp. 120-22).

Duménil presents one specific quote from Marx to support his interpretation that the key concepts of Marx's theory are defined in units of labor-time. The passage is the same one we have already discussed above with respect to Duménil's argument for a different method of determination of variable capital. The passage again is:

> "As for variable capital, the average daily wage is certainly always equal to the value product of the number of hours that the worker must work in order to produce its necessary means of subsistence; but this number of hours is itself distorted by the fact that the production prices of the necessary means of subsistence diverge from their values. (Marx 1981, pp. 261)

Duménil then argues:

> As a preliminary remark, Marx is referring here to a "wage" which is measured in labor time. It is therefore clear that all the amounts considered in this analysis are also measured in this unit: values, wages, prices of production. (1986, p. 52).

I argue that Duménil's misinterprets this passage. The wage is referred specifically here to the equal of the "value product" of a certain number of hours. Duménil interprets this "value product" in units of labor-time. If Duménil's interpretation is accepted, then this sentence is redundant and nonsensical, i.e. it means the "number of hours that are the product of a certain number of hours." However, I argue that the "value product" here refers to the money value added by a certain number of hours. In other words, "value" here refers to the "monetary expression of value," a shorthand that Marx used throughout the three volumes of Capital. According to Marx's labor theory of value, each hour of labor produces a certain amount of money value added (for example, in Marx's illustration of his theory of surplus-value in Chapter 7 of Volume 1, Marx assumed that each hour of labor produces a "value product" of 0.5 shillings).

Furthermore, even if Duménil's interpretation of this passage is accepted, is spite of the above argument to the contrary, this one passage from Volume 3 would be a very slim basis for Duménil's sweeping generalization that all of Marx's key concepts are defined in units of labor-time, especially with all the evidence to the contrary that I have summarized above (starting with the concept of capital as money that becomes more money).

It seems to me that Foley would agree with me that the key concepts of Marx's theory (e.g. capital, etc.) are defined in units of money and that these concepts correspond in principle to quantities of money entered in capitalists' bookkeeping accounts. These sums of money, like all sums of money, represent quantities of labor-time. But the concepts themselves are defined in units of money that circulate as capital in the real capitalist economy. But I will let Duncan speak for himself.[188]

In summary, the differences between Duménil's interpretation and my interpretation are greater than my differences with Foley's interpretation. In addition to the key difference regarding the determination of constant capital (and also the redefinition of the aggregate price-value equality from gross to net terms), there is also the even more fundamental difference with regard to whether the key concepts of Marx's theory refer to units of money or to units of labor-time. I have argued that, although Duménil presents more arguments for the different treatments of constant capital and variable capital (and also for the redefinition of the aggregate price-value equality), these additional arguments are also unsatisfactory and no more convincing than Foley's arguments. I have also argued that Duménil's interpretation of the key concepts of Marx's theory in terms of labor-time is a fundamental misinterpretation of the phenomena which Marx's theory, including his theory of prices of production, is intended to explain.

4. MOHUN'S "NEW SOLUTION" INTERPRETATION

The final version of the "new solution" to be considered here is that presented by Simon Mohun (1993). Mohun's interpretation is essentially the same as Foley's and Duménil's interpretation on the important points noted at the beginning of the last section: (1) he takes the money wage as an initial given, rather than the real wage; (2) he redefines the aggregate price-value equality from gross to net terms; (3) argues that Marx made a partial error in his determination of prices of production; and (4) he comes to essentially the same conclusions that the aggregate net price-value equality is satisfied simultaneously with the aggregate price-surplus value equality (but the aggregate gross price-value equality is not satisfied), and that the rate of profit changes in the determination of prices of production. On the issue of the monetary nature of Marx's theory, Mohun's interpretation is closer to Foley than to Duménil; Mohun argues that Marx's concepts of value added, profit and prices of production are defined in units of money (although, unlike Foley, Mohun defines constant capital, variable capital, and surplus-value in terms of labor-times).

The main difference between Mohun and Foley is that Mohun presents a different justification for taking the money wage as given instead of the real wage. Mohun does not explicitly mention Foley's justification that the actual exchange relation between capitalists and workers is in terms of the money wage and that in this way the unique aspects of capitalist exploitation can be explained. Instead, Mohun's justification is based on the unique characteristics of the commodity labor-power that is purchased with the money wage and on the definition of the value of labor-power.

Mohun argues that there are two options for defining the value of labor-power: (1) as the quantity of labor-time embodied in a given real wage or (2) as the quantity of labor-power represented by a given money wage. If prices are assumed to be equal to their values, then these two definitions are the same. However, in the more general case where prices are not equal to their values, then these two definitions will not be the same, and one has to choose between them. Mohun argues that, in this more general case, the second definition of the value of labor-power should be adopted, which implies that the money wage is taken as given.

Mohun's argument for this second definition of the value of labor-power is that labor-power is not a commodity like all other commodities, but is instead unique in that it is not produced by capitalist firms. Therefore, these is no equalization of profit rates involved in the determination of the price of labor-power, or no transformation of value into price in the case of labor-power. In the case of the unique commodity labor-power,

[188] Glick and Ehrbar (1987) present an interpretation of the "new solution" which seems to mostly follow Duménil (e.g. emphasis on the "double counting" argument for the net price-value equality). However, on this issue of whether Marx's concepts are defined in terms of money or labor-time, Glick and Ehrbar follow Foley, without however Foley's overall emphasis on the monetary nature of Marx's theory. They do not mention that Duménil presents an entirely different interpretation of Marx's concepts.

it actually exchanges at its value, i.e. its price is proportional to its value. Therefore, the value of labor-power is measured by the actual money wage paid to purchase labor-power, and not by the labor-time embodied in the means of subsistence.

Mohun argues further that this argument does not apply to the means of production because they are produced by capitalist firms and their prices of production do involve the equalization of profit rates. Therefore, the value of the means of production is equal to the labor-time embodied in them and is not in general equal to the actual money used to purchase them. Constant capital is derived from the given means of production, first as their value and then as their price of production.

Mohun seems to acknowledge that his definition of the value of labor-power is different from Marx's own definition, which was the first definition above (p. 298). However, Mohun argues that this definition of the value of labor-power is inconsistent with Marx's general principle, applied to all other commodities, that, with equal exchange, the value of commodities is measured by their money equivalent. If this principle is applied to labor-power, then the value of labor-power would be measured by the actual money wage, since labor-power actually exchanges at its value.

It can be seen that Mohun's reasons for taking the money wage as given, but not taking the money capital used to purchase the means of production as given, have to do with the unique characteristics of the commodity labor-power. The money wage is taken as given because labor-power, and only labor-power, actually exchanges at its value, which implies that the value of labor-power is measured by the money wage. We have already seen that Mohun's definition of the value of labor-power differs from Marx's own. But, more importantly, we have also seen above that Marx's reasons for taking both variable capital and constant capital as given in terms of money capital have to do with the nature of capital, not with the nature of labor-power, and with his method of determination of constant capital and variable capital, as the two components of the initial money capital (M) that begins the circulation of capital. Therefore, Mohun has in effect changed the question at issue from the determination of constant capital and variable capital to the determination of the value of labor-power (and the value of the means of production). From Mohun's perspective, it may make sense that the value of labor-power is determined differently from the value of the means of production. However, this distinction is irrelevant to Marx's determination of constant capital and variable capital. According to Marx's logical method, constant capital and variable capital are the two components of the initial money capital (M), and they are both determined in the same way - they are both taken as given as the quantities of money capital used to purchase labor-power and means of production in the first phase of the circulation of capital, whether or not these quantities of money capital are proportional to the values of labor-power and the means of production, as explained above. Again, there is no hint in Marx' writings that constant capital and variable capital, are determined differently, and in particular no hint of Mohun's argument for such different determinations, based on an equal exchange between money wages and labor-power.

Mohun's different analytical framework is indicated by the fact that his analysis focuses on the "circuit of labor-power," which he represents symbolically as: C - M - C. Mohun emphasizes the two acts of exchange in this circuit: (1) the sale of labor-power, C - M, and (2) the purchase of means of subsistence, M - C. The main point of Mohun's argument is that the first exchange is an exchange of equivalents (the money wage and the money-value of labor-power) and the second exchange is not. By contrast, I have argued above that the analytical framework for Marx's theory is the monetary circuit of capital, which is represented symbolically by M - C - (M + ΔM). The main point of Marx's theory is to explain how the given initial quantity of money capital (M) is transformed into more money (M + ΔM). The initial quantity of money (M) is divided into constant capital and variable capital, which are therefore determined in the same way, as the initial givens in the theory. Mohun, like Duménil, has lost sight altogether of the circulation of capital, the overall analytical framework of Marx's theory.

5. CONCLUSION

In summary, I think that the "new solution" interpretation of Marx's theory is an important advance in Marxian scholarship, especially in Duncan's Foley's version. However, even Foley has been only partially successful in breaking away from the dominant neo-Ricardian interpretation of Marx's theory. Foley rightly emphasizes the monetary nature of Marx's theory and this leads him to assume that variable capital is taken as given as the money wage and not derived from the given means of subsistence. However, Foley continues to assume that constant capital is derived from given means of production, as in the neo-Ricardian interpretation, and therefore ends up with inconsistent methods of determination of constant capital and variable capital. Also, Foley rightly emphasizes the macroeconomic nature of Marx's theory of surplus-value in Volume 1, and this leads him to assume that the aggregate value added is determined prior to its division into individual parts. However, Foley continues to assume that the rate of profit is determined simultaneously with individual prices, as in the neo-Ricardian interpretation, and therefore does not consistently adhere to the principle of the prior determination of aggregate magnitudes.

I have presented above and in other recent work arguments to support my interpretation that both constant capital and variable capital are determined in the same way and that both are taken as given as the two components of the money capital (M) that purchase means of production and labor-power in the first phase of the circulation of capital. These arguments are: (1) the general formula for capital which begins with M and which therefore suggests that the starting point of Marx's theory of capital is this initial money capital; (2) the logical structure of Parts 1, 2, and 3 of Volume 1 of Capital, according to which the analysis of money and circulation in Parts 1 and 2 provide the logical presuppositions for Marx's theory of surplus-value in Part 3 and beyond; (3) the methodological principle of historical specificity, according to which the key concepts of a theory of capitalism should refer to its historically specific features (e.g. money, capital, etc.) and not to the general features that capitalism shares with all modes of production (e.g. means of production); (4) the many passages throughout the various drafts of Capital that refer to the initial money capital (M) in the circulation of capital as "given", "presupposed", etc..

I would appreciate it very much if the proponents of the "new solution" would respond to these specific arguments and show how they are wrong, or perhaps lead to further difficulties. Because if these arguments are correct, then the "new solution" remains inconsistent and has not gone far enough in breaking away from the dominant neo-Ricardian interpretation.

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LABOR, MONEY, LABOR-SAVING INNOVATION AND THE FALLING RATE OF PROFIT*

Alejandro Ramos M.

The immediate purpose of capitalist production is not "the possession of other goods", but the appropriation of value, of money, of abstract wealth.

-Theories II, p. 503

Money is labour time in the form of a general object, or the objectification of general labour time, labour time as a general commodity.

-Grundrisse, p. 168

This article presents a procedure to calculate the rate of profit assuming one-time labor-saving innovation. The debate on the effect of technical change on the profit rate has been centered on the so-called Okishio Theorem, a proposition actually advanced in 1905 by Tugan-Baranowsky, and subsequently reproduced by Moszkowska and Shibata[189]. According to the Okishio Theorem, labor-saving innovation raises the profit rate, a result that contradicts the law of the tendential fall in the rate of profit, proposed by Marx in Capital III.

In the 70s, Sraffian writers used this proposition widely as a part of their debate against Marx's theoretical work. However, diverse authors have shown recently the fragility of this approach[190]. This article also shows that the Okishian calculation of the profit rate is a partial and erroneous formalization of Marx's point of view.

If a labor-saving innovation is introduced, the profit rate cannot be calculated in the same way as when technology is constant. Additionally, the occurrence of technical change requires the introduction of money, conceived not only as a numéraire or symbol-money, but also as a *reserve of value*, as a thing able to conserve a given amount of social labor-time in an objective form, i.e. as *reserve-money*. The Okishian vision does not take these two things into account. It proposes no modification in the

* This article is a thorough reworking of one that I presented at the 3d Mini-conference of the International Working Group on Value Theory at the Eastern Economic Association Convention in March 1996: "The Monetary Expression of Labor: An Interpretation of the Relation between Value-Substance and Value-Form". In particular, it reconsiders the issues of the original paper in the light of the dynamic problems posed by the Okishio Theorem. Many people helped me to clarify obscure intuitions. For help during the early stages of the research, I have to thank Guglielmo Carchedi, Paresh Chattopadhyay, Massimo de Angelis, Suzanne de Brunhoff, Werner de Haan, Alan Freeman, Jacques Gouverneur, Dave Kristjanson, Bruce Roberts and Adolfo Rodríguez. For help during the last stage, I am strongly indebted with Alfredo Saad-Filho, and with Andrew Kliman who has exceeded his task as editor of this article. None of these people are responsible for the opinions I present in this work. This article is dedicated to Graciela.

1 Okishio [1961], Tugan-Baranowsky [1905], Bortkiewicz [1907], Moszkowska [1929], Shibata [1934]. Croce [1899] could also be considered as a precursor of this interpretation. Uncritical histories of the Okishio Theorem can be found in Groll and Orzech [1989] and Howard and King [1989].

190 Ernst [1982], Kliman [1988], [1996], Carchedi (1991), Freeman [1995], [1996].

calculation of the profit rate when there is technical change, and reduces money to symbol-money. This explains its failure to formalize Marx's proposition correctly.

As will be shown, a key concept for analyzing the effect of labor-saving innovation on the profit rate is the monetary expression of labor (MEL), the quantitative relation between the form (specifically, the symbol-money form) and the substance (labor-time) of value[191]. Considering the dynamic of this relation permits one to contrast the Okishio Theorem to Marx's proposition and to formalize the latter.

The Okishian approach can be presented in the following way: let us focus on an economy in two different periods. In both periods, the same numéraire -kind of symbol-money, e.g. paper money- serves to measure commodity prices. In the second period a labor-saving innovation occurs, reducing the labor-time needed to produce the commodities. According to the Okishio Theorem, this change raises the rate of profit measured in numéraire prices. However, this is only one consequence of the labor-saving innovation because it also increases the MEL, a result ignored by the Okishio Theorem. A rising MEL implies that symbol-money represents less labor-time, an effect that in this article will be called *inflation of symbol-money*. In other words, as the labor-saving innovation reduces the labor-time represented by one unit of symbol-money, it becomes inflated in relation to the innovation's preceding period. Inasmuch as this endogenous inflationary effect compensates the rise in the Okishian rate of profit, the labor-saving innovation provokes a reduction in the profit rate measured in labor-time. Thus, the Okishian rate of profit can be interpreted as a *nominal* rate of profit, measured in terms of symbol-money.

In order to show this, the first and second sections present a simple numerical example assuming one-time technical change, prices = values, and a monetary system similar to that depicted by Marx in Capital I, Ch. 3. In a very simplified way, the third section focuses on the monetary consequences of the labor-saving innovation. The induced inflation provokes a crisis in the monetary system expressed by a devaluation of the symbol-money in terms of the *reserve-money*, which manifests the falling rate of profit externally. In the fourth section some factors that counteract and enhance the falling rate of profit -which could be formalized within this simple framework- are considered.

1. The static-nominal rate of profit

Throughout the following presentation, it will be assumed that prices = values; the inclusion of divergences between values and production prices complicates the exercise but adds nothing to the results. This framework also shows that the Okishian calculation fails to represent the dynamic of the rate of profit for reasons which are not linked with the so-called "transformation problem".

In this section, a two-department economy —means of production and means of consumption— is considered in a condition of stationary reproduction, i.e. having no technical change. This economy is depicted by the following matrices and vectors:

$$\mathbf{X}_t = \begin{bmatrix} 960 \\ 960 \end{bmatrix} \quad \mathbf{A}_t = \begin{bmatrix} 0.25 & 0.25 \\ 0 & 0 \end{bmatrix} \quad \mathbf{B}_t = \begin{bmatrix} 0 \\ 0.1 \end{bmatrix}$$

$$\mathbf{L}_t = [2.5 \; 2.5]$$

$$\mathbf{M}_t = \mathbf{A}_t + \mathbf{B}_t\mathbf{L}_t = \begin{bmatrix} 0.25 & 0.25 \\ 0.25 & 0.25 \end{bmatrix}$$

$$\mathbf{Y}_t = (\mathbf{I} - \mathbf{A}_t)\mathbf{X}_t = \begin{bmatrix} 480 \\ 960 \end{bmatrix}$$

$\mathbf{X}_t$ is the physical output vector, measured in units; $\mathbf{A}_t$ is the matrix of unit means of production coefficients; $\mathbf{L}_t$ is the vector or unit living labor coefficients and $\mathbf{B}_t$ is the vector of real wage, means of consumption per working day. The irreducible matrix $\mathbf{M}_t$ is formed by the unit coefficients of means of production (first row) and means of consumption (second row). Under static conditions, total physical net product is $\mathbf{Y}_t$.

It is known that the *static* rate of profit (π_t) of this economy is given by $\pi_t = (1/\varepsilon_t) - 1$,, where ε_t is the maximum eigenvalue of matrix $\mathbf{M}_t$. In the example, $\varepsilon_t = ½$ (< 1; the economy is "productive"), and thus $\pi_t = 100\%$. Relative prices (= values) are obtained by the following system of homogeneous equations:

$$\mathbf{P}_t [\mathbf{M}_t - \varepsilon_t \mathbf{I}] = 0$$

where $\mathbf{P}_t$ is the vector of relative prices. This system may be normalized by $P_2 = 1$, thus defining the physical exchange proportion between the two commodities:

$$\mathbf{P}_t = [1 \; 1]$$

It is important to say that the above procedure for obtaining the rate of profit through ε_t, as well as the calculation of relative prices by means of equation [1], is not a general method for calculating these magnitudes. It is valid only under two special conditions: either when there is no technical change, or when there is technical change but, over time, prices = values. The latter is the condition considered in this article[192].

Now then, in capitalist society, exchanges are carried out by means of *money*, and not by barter relations, as equation [2] suggests. In Capital I, Marx distinguishes three functions of money: money as measure of value, money as means of circulation and "money-as-money". Money considered "as money" functions as an instrument of hoarding, means of payment and world money[193]. These functions are actually performed under some set of socially valid rules and institutions, i.e. a under a *monetary system*.

In this article, it is considered a monetary system in which the form of value is constituted by two closely related aspects or kinds of money, *symbol-money* and *reserve-money*. Commodities are compulsorily exchanged by means of symbol-money

[191] This relation has been studied in static terms, among other authors, by Aglietta [1979] and Foley [1982]. See also Saad-Filho [1993a], Rodríguez [1994] and Ramos [1996].

[192] When there is technical change and, for instance, prices = production prices, the nominal profit rate cannot be obtained through ε_t; nor can be relative prices calculated by means of system []

[193] Capital I, p. 227-244. See also de Brunhoff [1976].

—the *pound*, £— paper money without intrinsic value issued by a national monetary authority which has "objective social validity... [acquired by] its forced currency"[194]. Side by side with symbol-money, there is also a commodity-money —*gold*— which has a parity with the £ sanctioned by the monetary authority. Hence, in this framework, reserve-money is a commodity with intrinsic value and, then, it contains, represents and can conserve a given amount of social labor-time[195]. The monetary authority can only issue paper money; so, it has no influence, for example, on the rate of interest.

The monetary system is thus organized by means of paper money endowed with forced currency and guaranteed by gold, the reserve-money. Additionally, it is assumed that, under certain circumstances, symbol-money can perform *any* monetary function[196]. In particular, the possibility of a continuous use of symbol-money instead of gold is given by the stability of the parity £/gold. Contrarily, a rise in this relation would provoke the lost of monetary functions by symbol-money and, consequently, an increase in the use of gold as money.

So, the first relation defining the monetary system is the *parity pound/gold* (G_t). This relation is defined as the amount of pound notes freely exchangeable with one ounce of gold in a given period. The dimension of this ratio is:

$$G_t = £/o.g.$$

where o.g. means "ounces of gold". In period t, the specific parity pound/gold sanctioned by the monetary authority is £1 = 1 ounce of gold.

As already was noted, in this monetary system, because reserve-money is a commodity (*gold*), it *contains* and *represents* a certain amount of labor-time. However, it will be supposed that gold is not produced in this economy. The labor-time contained in, and represented by, one ounce of gold defines a second relation of the monetary structure: the *parity labor-time/gold* (γ_t), which has the dimension:

$$\gamma_t = w.d./o.g$$

where w.d. means "working days". This is a relation between the substance of value —labor-time— and one specific aspect of the form of value —reserve-money. Frequently, Marx calls it "value of money", which is an ambiguous designation for two reasons: Firstly, because it is a relation between *labor-time* and reserve-money, not between "*value*" and "*money*". Secondly, because it can be confused with another relation, that between *labor-time* and *symbol-money*, which will be examined below. It is, thus, convenient to establish a special designation for γ_t, the relation between *labor-time* and *reserve-money*. Concerning γ_t, it will be supposed, firstly, that, in period t, the labor-time contained in one ounce of gold is equal to that contained in each of produced commodities and, secondly, that this relation is constant over time, i.e. $\gamma_t = \gamma_{t+1}$. The latter is an important assumption of Marx in Capital III, made in order to analyze the dynamic of profit rate: "Firstly, the *value of money*. This we can take as constant throughout."[197]

The explicit consideration of *symbol-money* permits one to establish a third relation in the monetary system: the *monetary expression of labor* (MEL_t), a ratio between the *pound* (£) and the substance of value (labor-time):

$$MEL_t = £/w.d.$$

Since there is forced currency of paper money, labor-time is necessarily expressed through *pounds*. This defines the MEL_t as the amount of symbol-money which represents one unit of labor-time in a given period. (In section 3, it will be shown that the equation $MEL_t = G_t/\gamma_t$ is valid only under static conditions.)

Table 1	C	V	C+V	SV=PR	VA=PP
I	240	240	480	480	960
	(800)	*(800)*	*(1.600)*	*(1.600)*	*(3.200)*
II	240	240	480	480	960
	(800)	*(800)*	*(1.600)*	*(1.600)*	*(3.200)*
Σ	480 [3]	480	960	960	1920
	(1.600)	*(1.600)*	*(3.200)*	*(3.200)*	*(6.400)*

Because, in period t, the labor-time contained in one ounce of gold is the same that that contained in each of the produced commodities and G_t = £1/1 ounce of gold, the vector of symbol-money prices —i.e. the exchange ratios of commodities [2] expressed in paper money— is $\mathbf{P}_t^{£}$ = [£1 £1]. Then, using the above-presented data, it is possible to construct the scheme of reproduction given in table 1

In Table 1, numbers in the first line of each department are measured in £, while numbers in parentheses are measured in working days. The calculation of the latter will be explained below. Since prices = values, in each department the surplus value (SV) produced is equal to the appropriated profit (PR) and objectified value (VA) is equal to production price (PP). The static rate of profit is π_t = 100% and the rate of surplus value σ_t = 200%.

For reproduction to be accomplished, a mass of symbol-money (μ_t) must exist. Assuming that only current output is exchanged, this mass is defined by the following equation[198]:

$$\mu_t = P^{£}{}_t X_t / V_t \qquad [6]$$

where scalar V_t is the velocity of circulation of symbol-money. It will supposed that V_t = 1, so the mass μ_t introduced by the monetary authority is μ_t = £1920.

The MEL corresponding to the living labor can be defined as the ratio between the *value-product* (£-prices multiplied by physical net product) and total living labor $\mathbf{L}_t\mathbf{X}_t$. Under the static conditions prevailing in period t, this quotient is equal to the MEL

[194] Capital I, p. 226.

[195] It is assumed that reserve-money is a commodity in order to simplify and to set a framework similar to that presented by Marx in Capital. However, reserve-money is essentially a functional, not natural, determination of money. Therefore, a non-commodity can act as reserve money. For instance, the US dollar is the reserve-money corresponding to the paper money issued in some Latin American countries. In this case, what is decisive for the peripheral monetary system is that reserve-money *represents* (not *contains*) a given amount of labor-time in a "stable" form. Contrasting with this opinion, see Mandel [1984], who maintains that reserve-money must be gold.

[196] Except that of "world money", because the £ has a national determination.

[197] Capital III, p. 142. I am grateful to Alan Freeman who drew my attention to this important passage. Certainly, relation γ can change over time. Marx considers the effect of its variations, for instance in *Contribution*, p. 182-3. However, the analysis of this variation is beyond the scope of this article.

[198] Capital I, p. 216.

corresponding to the whole labor-time objectified in the economy. Therefore, MEL_t can be calculated as:

$$MEL_t = P^{£}_t\ Y_t/L_tX_t = £1440/4800w.d. = £0.3/w.d \quad [7]$$

(In section 2, a more general calculation of the MEL will be presented.) Thus, in period t, one working day is expressed through £0.3, or, in other words, £1 expresses 1/0.3 = 3.33 working days.

Always taking into account that, in period t, static conditions prevail and prices = values, it is easy to calculate the vector of labor-times contained in commodities, either by $\mathbf{P}^{£}_t = \mathbf{P}^{£}_t(1/MEL_t) = [3.33\ w.d.\ 3.33\ w.d.]$, or by $\mathbf{P}^{£}_t = \mathbf{L}_t[\mathbf{I}-\mathbf{A}_t]^{-1}$. By means of vector $\mathbf{P}^{£}_t$, labor-time magnitudes in Table 1 (numbers in parentheses) are worked out. For instance, labor time contained in constant capital is $(\mathbf{P}^{£}_t\mathbf{A}_t)_j(\mathbf{X}_t)_j$; so, for Department I the calculation is 3.33*0.25*960 = 800 w.d.

Since the labor-time contained in one ounce of gold (relation [4]) is assumed to be equal to that contained in each of the produced commodities, the *parity labor-time/gold* is $\gamma_t = 3.33$ working days per ounce of gold.

2. The dynamics of the labor rate of profit

The Okishio Theorem states that the rate of profit varies *inversely* to changes in the use of any input per unit of output. Thus, an *input-saving* innovation, reducing the intensity of either means of production or living labor, would increase the profit rate.

This approach is specially controversial for Marx's theory regarding the effect of reductions of living labor on the profit rate. If a labor-saving innovation provokes an increase in the profit rate, this would mean that profit is not a form of exploited labor, i.e. profit would arise from a source other than appropriated human labor.

Inasmuch as the main issue posed by the Okishio approach is the effect on the profit rate of a "saving" of living labor, the following exercise will consider a pure labor-saving innovation, one which leaves constant the amount of means of production per unit of output and reduces that of living labor[199]. According to the Okishio Theorem, this must imply an increase in the rate of profit; according to Marx, a reduction.

In period t+1, a uniformly labor-saving innovation is introduced in both sectors[200]. Physical output and the use of means of production are doubled, but only 90% of the living labor used in period t is employed, i.e. $\mathbf{L}_{t+1}\mathbf{X}_{t+1} = 4.320$, instead of $\mathbf{L}_t\mathbf{X}_t = 4.800$ working days. The real wage per unit of living labor is constant. In t+1, the economy is described by the following vectors and matrices.

$$X_{t+1} = \begin{bmatrix} 1920 \\ 1920 \end{bmatrix} \quad A_{t+1} = \begin{bmatrix} 0.25 & 0.25 \\ 0 & 0 \end{bmatrix} \quad B_{t+1} = \begin{bmatrix} 0 \\ 0.1 \end{bmatrix}$$

$$L_{t+1} = [1.125\ \ 1.125]$$

$$M_{t+1} = A_{t+1} + B_{t+1}L_{t+1} = \begin{bmatrix} 0.2500 & 0.2500 \\ 0.1125 & 0.1125 \end{bmatrix}$$

After labor-saving innovation, the eigenvalue $\mathbf{M}_{t+1}$ is $\varepsilon_{t+1} = 0.3625 < \varepsilon_t = 0.5$. Therefore $\pi_{t+1} > \pi_t$, namely 176% > 100%. This is the result obtained by Tugan-Baranowsky in 1905 and reproduced by Okishio in 1961. Contrary to Marx's statements, a labor-saving innovation would rise, not reduce, π. This is simply an application of a Perron-Frobenius theorem: "The eigenvalue ε is a continuous, increasing function of the elements of **M**."[201] Since the ratios of the second row of $\mathbf{M}_{t+1}$ are lesser than those of $\mathbf{M}_t$, $\varepsilon_{t+1} < \varepsilon_t$ and, thus, $\pi_{t+1} > \pi_t$.

Initially, the Okishian calculation of π seems to suggest that the reduction in living labor has an influence opposite to that maintained by Marx. Actually, for this formalization, labor-time has no real influence on the profit rate. This is clear when one imagines a continuous reduction in living labor, which reduces unit real wages (matrix **BL**) to the limit zero, a dynamic that implies a continuous increase in π. Hence, an economy without human labor would yield a π > 0, a paradox already formulated by Dimitriev in 1904[202]. This paradox results from the fact that the calculation of π through ε is only a partial, static and money-neglecting formalization of Marx's theory. Before this can be considered in detail, it is necessary to develop the numerical example for period t+1.

Through equation [1], and again normalizing $P_2 = 1$, the vector of physical exchange between both commodities is obtained:

$$P_{t+1} = [1\ 1]$$

This vector is equal to [2] because innovation has been uniform for both departments. On the other hand, since there has been no change in the monetary system, prices expressed in symbol-money are equal to those of period t, i.e. $\mathbf{P}^{£}_{t+1} = [£1\ \ £1]$.

[199] The three-department example presented by Tugan-Baranowsky [1905], (pp. 180-1) assumes an uniform innovation which reduces the intensity of both means of production and living labor. Okishio's three-department example [1961], (pp. 92-5) presents an innovation in Department II which increases the intensity of means of production and reduces that of living labor.

[200] The competitive process that induces some capitalist to develop this surplus-profit-generating process, and to others to forcibly adopt the new labor-saving techniques, will not be considered here.

[201] Pasinetti [1977], p. 272.

[202] "[I]t is theoretically possible to imagine a case in which all products are produced exclusively by work of machines, so that no unit of *living labor*... participates in production, and nevertheless an industrial profit may occur... this is a profit which will not differ essentially in any way from the profit obtained by present-day capitalists using hired workers... We have therefore seen, proceeding from Ricardo's analysis, that the origin of industrial profit does not stand in any 'special' relationship to the human labor used in production." Dimitriev, [1904], pp. 63-4.

Table 2	C	V	C+V	SV=PR	VA=PP
I	480	216	696	1.224	1.920
	(1.600)	*(720)*	*(2.320)*	*(1.440)*	*(3.760)*
II	480	216	696	1.224	1.920
	(1.600)	*(720)*	*(2.320)*	*(1.440)*	*(3.760)*
Σ	960	432	1.392	2.448	3.840
	(3.200)	*(1.440)*	*(4.640)*	*(2.880)*	*(7.520)*

Table 2 presents the scheme of reproduction of t+1. Numbers in parentheses are labor-time magnitudes, the calculation of which will be explained below.

π_{t+1} = £2.448/£1.392 = 176% and the rate of surplus-value σ_{t+1} = £2.448/£432 = 567%. Now then, since physical output has risen, reproduction in monetary terms faces a restriction, i.e. "the quantity of [symbol-]money... must increase."[203] In period t, the mass of symbol-money was μ_t = £1.920, which is not enough to allow the circulation in t+1. According to equation [6], this restriction could be overcome either by an increase in V_{t+1} or by an increase in μ_{t+1}. It will be supposed here that V_{t+1} remains constant and that the monetary authority raises μ_{t+1} to £3.840.

How are the labor-time magnitudes of t+1 calculated? According to Table 2, at the start of t+1, capitalists advanced £1.392. This symbol-money is simply the representation of a certain amount of labor-time. As Marx says: "Money is labour time in the form of a general object."[204] Now then, at the beginning of t+1, how many working days does £1.392 represent? Since, at this moment, the labor-saving innovation has not been introduced, the relation between symbol-money and labor-time is equal to that prevailing in period t, so that, £1 = 3.33 working days. So, as the MEL at the start of t+1 is necessarily equal to the MEL at the end of t, £1.392 represents £1.392*3.33 = 4.640 working days.

This is the labor-time corresponding to the cost-price, but how much surplus-labor is exploited in t+1? In this period, total living labor is $\mathbf{L}_{t+1}\mathbf{X}_{t+1}$ = 4.320 working days. Surplus-labor is the difference between total living labor and *necessary labor*, the labor represented by £432, advanced as variable capital. Since necessary labor is £432*3.33 = 1.440 working days, surplus-labor is 4.320-1.440 = 2.880 working days. The total labor-time objectified in t+1 is equal to the labor-time represented by the cost price + surplus-labor, 4.640 + 2.880 = 7.520 working days.

This allows us to calculate the rate of profit in labor-time terms, π^*_{t+1}, which is equal to:

$$\pi^*_{t+1} = 2.880 w.d./ 4.640\ w.d. = 62\%$$

So, π^*_{t+1} = 62% is less than the nominal rate of π_{t+1} = 176%. Since static conditions prevailed in period t, $\pi_t = \pi^*_t$ = 100% and therefore the profit rate in labor-time terms has fallen between t and t+1. The rate of exploitation is 2.880 w.d./1.440 w.d. = 200%, less than the nominal rate of surplus-value σ_{t+1} = 576% and equal to that of period t, σ_t. This last result depends decisively on the fact that variable capital represents an amount of labor-time given by MEL_t. The amount of π^* and σ^* would be greater if variable capital in labor-time terms were calculated by means of MEL_{t+1}, instead of MEL_t. The first calculation implies that the *value of labor-power* is constant and is equivalent to Marx's assumption in Capital III, Ch. 13, regarding the constancy of the rate of surplus-value.[205] The second calculation (using MEL_{t+1}) means that only *nominal wage* is constant, a situation which implies a reduction in the value of labor-power and thus an increase in σ^*. However, as it will be shown in section 4, the resulting rise in the rate of surplus-value does not completely offset the falling π^*.

The MEL_{t+1} corresponding to total production is calculated by the following formula:

$$MEL_t = P^{£}_{t+1}X_{t+1}/(P^{£}_{t}A_{t+1}X_{t+1}(1/MEL_t) + L_{t+1}X_{t+1}) = £0.5106/w.d.$$

Equation [10] relates total output, measured in £, and total labor-time objectified in period t+1, given by the sum of the past labor-time, transferred from constant capital, and the living labor-time added. The price of the means of production used in period t+1 is determined at the end of period t, so that, when period t+1 starts, capitalists have already paid this price. Therefore, past labor-time corresponding to period t+1 is given by $\mathbf{P}^{£}_{t}\mathbf{A}_{t+1}\mathbf{X}_{t+1}(1/MEL_t)$[206].

As was noted in section 1, after labor-saving innovation has been introduced, the MEL_{t+1} corresponding to total production (equation [10]) differs from that of *living labor*. The latter (MEL^{L}_{t+1}) is given by:

$$MEL_{t+1} = [P^{£}_{t+1}X_{t+1} - P^{£}_{t}\,A_{t+1}X_{t+1}]/L_{t+1}X_{t+1} = £0.67\ /w.d.$$

This formula relates *value-product*, measured in £, with living labor. Value-product is the difference between total output and constant capital, determined by the price of the means of production prevailing at the start of t+1[207].

By means of equation [10], it is possible to calculate the vector of living labor contained in commodities in t+1: $\mathbf{P}^{£}_{t+1} = \mathbf{P}^{£}_{t+1}(1/MEL_{t+1})$ = [1.9583 w.d. 1.9583 w.d.]. A logical consequence of the labor-saving innovation is that $\mathbf{P}^{£}_{t+1} < \mathbf{P}^{£}_{t}$ = [3.33 w.d. 3.33 w.d.]. In contrast to the stationary situation considered in section 1, it is now no longer possible to calculate $\mathbf{P}^{£}_{t+1} = \mathbf{L}_{t+1}[\mathbf{I}-\mathbf{A}_{t+1}]^{-1}$. This calculation would imply the absurd situation that, given a labor-saving innovation, the labor contained in commodities at the end of t+1 would be equal to the labor contained at the beginning of this period. It is important to stress that money advanced at the beginning of t+1 is an *irreversible cost*, representing an amount of labor-time which is the real cost-price of commodities.

[9]

[203] Capital I, p. 215. "We do not need to rack out our brains to grasp that if our quarter of wheat costs £2, 100 quarters will cost £200, 200 quarters £400, and so on, and therefore that the quantity of money which changes places with the wheat, when it is sold, must increase as the quantity of the wheat increases." Capital I, pp. 214-5. In other words: "For Marx, inflation was not initially a monetary phenomenon, but derived from real forces." Naples [1996], p. 103.

[204] Grundrisse, p. 168.

[205] Capital III, p. 317. In Capital I, Marx also discusses this: "It will therefore be useful, if we want to conceive the relation in its pure form, to presuppose for the moment that the possessor of labour-power, on the occasion of each sale, immediately receives the price stipulated in the contract." Capital I, p. 279.

[206] This is the correct insight of the "sequential" or "temporal single system" approach developed by some authors: Ernst [1982], Carchedi [1984], Kliman and McGlone [1988], Giussani [1991], Maldonado-Filho [1995], Carchedi and de Haan [1996], Freeman [1996], McGlone and Kliman [1996]; an important precursor of this approach is Perez [1980].

[207] On "value-product", see Capital I, pp. 321 and 669.

Moreover, it is this *real* cost —the labor-time already spent— which must be compared with the surplus-labor exploited during t+1.

What is the effect of the labor-saving innovation on MEL_{t+1}? According to equation [10], in t+1, £1 represents 1/0.5106 = 1.9583 working days while, in period t, £1 represented 3.33 working days. Therefore, as a result of the labor-saving innovation, symbol-money represents less labor-time; specifically, it represents only 1.9583/3.33 = 0.5875 of that represented in period t. Now, more monetary symbols (1/0.5875 = 1.702) are needed to represent one working day. This is a measure of the endogenous inflationary effect of the labor-saving innovation on symbol-money.

Therefore, the labor-saving innovation has two effects: It increases the nominal rate of profit but also raises the MEL, thereby reducing the capacity of symbol-money to represent labor-time. The Okishio Theorem takes only the first effect into account, neglecting the increase in the monetary expression of labor. However, this twofold result is implicitly stated by Marx:

> In itself, an increase in the quantity of use-values constitutes an increase in material wealth. Two coats will clothe two men, one coat will only clothe one man, etc. Nevertheless, an increase in the amount of material wealth may correspond to a simultaneous fall in the magnitude of its value[208].

Effectively, π describes the "material rate of profit"[209] such that it rises with an increase in "material wealth", ceteris paribus. However, this is only one result of the innovation, which also produces a "simultaneous fall in the magnitude of value". This "fall" is not formalized by π —which, therefore, is a one-sided representation of the dynamics of capitalist wealth— but by the increase in the MEL. In capitalist society, the increase in material wealth is not an aim in itself: "The immediate purpose of capitalist production is not the 'possession of other goods' but the appropriation of value, of money, of abstract wealth."[210]

The reduction in the amount of the *substance of value* —the living labor used— implies that, now, a given amount of symbol-money —one of the aspects of the form of value— represents less value, less labor-time. Value is the unity of substance and form; it is an amount of labor-time that must be expressed through money. Therefore, the "simultaneous fall in the magnitude of value" is expressed by a modification in the MEL, the quantitative relation between both poles of value.

The "simultaneous fall in value" provokes the reduction in the rate of profit in labor-time terms, which has been arithmetically calculated in [9]. The following is an algebraic derivation of this rate:

$$\pi^*_{t+1} = [P^{£}_{t+1} M_{t+1} X_{t+1} (1+\pi_{t+1})(1/MEL_{t+1}) - P^{£}_{t} M_{t+1} X_{t+1} (1/MEL_{t+1})] / P^{£}_{t} M_{t+1} X_{t+1} 1/MEL_{t+1}) \quad [12]$$

Multiplying both numerator and denominator by MEL_t, and canceling the expression of cost-price, one obtains[211]:

$$1+\pi^*_{t+1} \; (1+\pi^*_{t+1}) \; MEL_t / MEL_{t+1}$$

It is clear that $\pi^*_{t+1} = \pi_{t+1}$ when $MEL_{t+1}/MEL_t = 1$, i.e. when there is no labor-saving innovation.[212] An alternative formula for π^*_{t+1} is:

$$\pi^*_{t+1} = [1+\sigma_{t+1}-\alpha_{t+1}]/[\alpha_{t+1}(1+K_{t+1})$$

where σ_{t+1} is the *nominal* rate of surplus-value (£2.448/£432 = 567%), K_{t+1} is the nominal composition of capital (£960/£432 = 2.22)[213], and α_{t+1} is the ratio between the MEL corresponding to living labor (equation [11]) and the MEL_t, so $\alpha_{t+1} = MEL^{L}_{t+1}/MEL_t = 0.67/0.3 = 2.22$.

Labor-saving innovation reduces the capacity of symbol-money to represent labor-time -an inflationary effect- and raises the nominal rate of profit (π). In equation [13], the inflationary effect is represented by the ratio $MEL_t/MEL_{t+1} = 0.5875 < 1$. In equation [14], symbol-money inflation is represented by the ratio $\alpha_{t+1} > 1$. Equations [13] and [14] have an important, Marxist, property: a continuous labor-saving innovation will cause a continuous rise in the MEL. If the amount of living labor tends toward zero, MEL tends toward infinity, and π^* tends toward zero. This overcomes the paradox of an economy without living labor and $\pi > 0$[214].

The two effects caused by the labor-saving innovation (increasing π *and* increasing MEL) can be formalized by the following inequalities:

$$MEL_{t+1}/MEL_t > (1+\pi_{t+1})/(1+\pi_\tau) > 1$$

Recalling that, in period t, $\pi_t = \pi^*_t$, and using equation [13], it is clear that

$$\pi^*_{t+1} < \pi^*_t$$

The law of the tendential fall in the rate of profit can be stated saying that a labor-saving innovation provokes an increase in the MEL greater than that corresponding to the nominal rate of profit.

3. The reserve-money rate of profit and the monetary crisis

We have seen that there are two rates of profit, one expressed in symbol-money, π_{t+1} = 176%, and the real profit rate, expressed in labor-time, π^*_{t+1} = 62%. Equation [13] shows that the relation between these rates is given by the ratio of the monetary expressions of labor, MEL_t/MEL_{t+1}. The difference between π_{t+1} and π^*_{t+1} arises from the increase in the MEL caused by the labor-saving innovation, which diminishes the capacity of symbol-money to represent labor-time.

[208] Capital I, pp. 136-7.

[209] See Ernst [1982], p. 90.

[210] Theories II, p. 503.

[211] On this equation, see Carchedi [1991], Ch. 5 and McGlone and Kliman [1996].

[212] In connection with the "transformation problem", this has been assumed by Roberts [1981], Wolff, Roberts and Callari [1982], Ramos [1991], Rodríguez [1994], Ramos and Rodríguez [1996].

[213] On the distinction between value and organic composition of capital, see Capital I, p. 762, Capital III, p. 900-1, Theories III, pp. 386-7 and Saad-Filho [1993b].

[214] "Two workers working for 12 hours a day could not supply the same surplus-value as 24 workers each working 2 hours, even if they were able to live on the air..." Capital III, p. 356.

Although π^*_{t+1} is the real rate of profit, it must be expressed, in some way, through the external measure of value, namely *money*.[215] The monetary expression of π^*_{t+1} could be carried out either by means of symbol-money or reserve-money.

Firstly, let us consider how π^*_{t+1} could be expressed by means of symbol-money. It is clear that, although the labor-saving innovation has reduced the *quantitative* capacity of symbol-money to represent labor-time, this does not affect its *qualitative* function. Labor-time magnitudes forming the real profit rate can be converted into symbol-money magnitudes by simply multiplying them by a constant MEL, for instance by MEL_t = £0.3/w.d. Thus, cost-price is 4.640 w.d.*0.3 = £1.392 and surplus-labor is 2.880 w.d.*0.3 = £864; the profit rate is £864/£1.392 = 62%. These are ideal symbol-money figures, since actually the MEL does not stay constant. However, the fall in the profit rate would not be felt by capitalists were money only a symbol. To have a real expression of this effect, it is necessary to take into account the other type of money, reserve-money, gold.

In period t, we have assumed that the *parity labor-time/gold*, γ_t (relation [4]) was 3.33 working days per ounce of gold. Gold is not produced in this economy, so the labor-saving innovation has not involved it. Hence, the amount of labor contained in gold remains constant during period t+1, γ_{t+1} = 3.33 working days per ounce of gold. So, dividing cost-price in labor-time terms and surplus-labor by this *constant* γ, it is obtaining the same rate of profit already obtained using a constant MEL.

The falling rate of profit appears clear to capitalists only insofar as they actually try to express and appropriate their profit in terms of physical gold. At the beginning of period t+1, capitalists advanced £1.392 which, at this time, were freely changeable by 1.392 ounces of gold because both forms of money represented the same amount of labor-time: 4.640 working days. The *parity pound/gold* sanctioned by the monetary authority (relation [3]), was G_t = £1/1 ounce of gold. At the end of t+1, capitalists pocket £2.448, which represent 2.880 working days of surplus-labor (See Table 2). This amount of surplus-labor, appropriated under the form of symbol-money, can no longer be converted into 2.880 ounces of gold, as it could in period t, but only into 864 ounces of gold, i.e. the quantity of reserve-money which represents this labor-time (2.880 w.d./3.33). Therefore, the parity pound/gold G_{t+1} has risen from G_t = £1/1 ounce of gold to G_{t+1} = £2.83/1 ounce of gold (£2.448/864 ounces of gold). In period t, $G_t = MEL_t*\gamma_t$, but now $G_{t+1} = MEL^s_{t+1}*\gamma_{t+1}$, where MEL^s_{t+1} is the monetary expression of *surplus-labor* (£2.448/2.880 w.d. = £0.85/w.d.; see Table 2). In the static situation depicted in period t, the MEL is common to the diverse components of commodities' value, an equality which ceases in period t+1.

The devaluation of £ against gold induces a monetary crisis, because symbol-money has not maintained its capacity to conserve value. Now, a contradiction between the two kinds of money —symbol-money, and that functioning as a reserve of value— arises. Since the labor-saving innovation has "destroyed the truth" in the £ as an instrument suited to conserve value, capitalists can start increasingly to express their assets either in terms of reserve-money or in another symbol-money. This implies that, rapidly, the £ loses its diverse monetary functions. What was money in period t, becomes non-money in period t+1. The monetary authority must avoid this situation and, primarily, "reestablish the truth" in £. Because, in this abstract exercise, the only power of the monetary authority is to issue symbol-money, it is forced to carry out a monetary reform. The "new pound" (£*) is therefore created; its sanctioned parity against the reserve-money is, again, £* = 1 ounce of gold, replacing "new pounds" for "old pounds" in the proportion £*1 = £2.83[216]. "Old pounds" are no longer legal means of circulation. Thus, at the end of t+1, capitalists must forcibly deflate (by 1/2.83) their £2.448 profit, which becomes £*864 (corresponding to 864 ounces of gold). Having advanced £1.392 (corresponding to 1.392 ounces of gold), their reserve-money rate of profit is 62%.

Discussion of the complexities behind the notion of reserve-money[217], as well as the dynamic of the profit rate when credit system, State debt, stock market, etc. are taken into account, clearly lies beyond the purpose of this article. Certainly, the rate of profit falls through a concrete process more complex than that suggested by the above-presented exercise, whose main purpose is, rather, to stress the meaning of Marx's assumption regarding the constancy of the "value of money" when the law of the tendential fall in the rate of profit is analyzed[218]. This assumption implies that the dynamics of the rate of profit in the presence of labor-saving innovations should be analyzed using a money having a constant or "stable" capacity to represent labor-time. The endogenous inflationary effect on symbol-money arising from the labor-saving innovation must therefore be eliminated in order to calculate the rate of profit, a methodological point that is missed in the Okishian tradition.

4. Counteracting and enhancing factors

A systematic analysis of the counteracting and enhancing factors of the tendency to fall of the rate of profit is also beyond the scope of this article. To consider the cheapening of constant and variable capital, economy in means of production, technological depreciation, and other factors affecting the dynamic of profit rate, would require that a succession of periods be taken into account[219]. Notwithstanding this, the rise in the rate of exploitation (as a counteracting factor) and the presence of fixed capital (as an enhancing factor) can be considered in the simple framework presented above.

4.1 Increasing rate of exploitation

In equation [12], in order to calculate π^*_{t+1} the *total* capital advanced is expressed in labor-time terms by means of MEL_t. This means that both, constant and variable capital are *advanced* at the beginning of t+1. As was noted in section 2, this procedure implies

[215] "Money as a measure of value is the necessary form of appearance of the measure of value which is immanent in commodities, namely labor-time." Capital I, p. 188.

[216] In most Latin American countries, processes similar to this "reform" are carried out daily by means of the exchange rate of the local currency with the US dollar. However, this does not align prices with labor-time because, presumably, the US dollar becomes inflated over time in relation to labor-time.

[217] Two obvious directions of research can be mentioned: Firstly, the analysis of the *change* in the capacity of reserve-money (not only of symbol-money, as it is considered in this article) to represent labor-time. Secondly, the analysis of the *nature* of reserve-money. In this respect, it is clear that, although gold has been legally suppressed as reserve-money since 1971, this does not mean that the function of value conservation has been (or may be) eliminated, but only that, nowadays, the nature of reserve-money is more complex than that considered by Marx.

[218] Capital III, p. 142. See footnote 196.

[219] See, for example, Freeman [1996] and Kliman [1996].

that, in period t+1, the rate of exploitation is equal to that of period t+1 (200%), and that necessary labor remains 1/3 of the working day.

However, workers are paid in symbol-money, which, at the end of period t+1, represents less labor-time[220]. It is clear that if the MEL changes during period t+1, then the same symbol-money wage will represent a different amount of labor-time if workers receive their wages at the end of the period than if they received them at the start. This means that variable capital should be converted into labor-time units by means of MEL_{t+1}, not MEL_t. Using the data of Table 2, variable capital represents £432/0.5106 = 846 working days of necessary labor and, thus, the surplus-labor amounts to 4.320-846 = 3.474 working days. So, workers would appropriate only an equivalent of 1/5 of the working day. This rise in the rate of exploitation (to 411%) compensates for the fall in labor-time rate of profit. According to this calculation, the cost-price in labor-time terms is $3.200_c+846_v = 4.046$ working days. Calling the resulting rate of profit π^{**}_{t+1}, one obtains $\pi^{**}_{t+1} = 3.474/4.046 = 86\%$. Thus, despite the rise in the rate of exploitation, π^{**}_{t+1} is less than $\pi_t = 100\%$[221].

Marx considers this type of effect in a letter to Engels of April 22, 1868:

If, with a falling value of money, the price of labour does not rise by the same proportion, then it *falls*; the rate of surplus-value would then rise and so, all other things being equal, does the rate of profit. The increase in the latter... is due to a simple lowering of wages, and the decrease is due to the situation where the change in wages only slowly accommodates the change in the value of money.[222]

Marx's "falling value of money" is, in the framework of this article, a "rising MEL", provoking a fall in the labor-time represented by symbol-money. It is important to note that, in Marx's letter, changes in the MEL (corresponding to symbol-money) are not distinguished clearly from those of the parity labor-time/gold (corresponding to reserve-money). In any case, in an analysis of the falling rate of profit taking into account more periods than t and t+1, Marx's assumption of constant rate of surplus-value implies that, eventually, wages rise, annulling the increase in the MEL, and preserving the fraction of the working day for which workers receive an equivalent.

However, even assuming that this is a factor permanently counteracting the falling rate of profit, it is, at the same time, offset by the falling in the relative importance of living labor in total advanced capital. This is shown by an algebraic specification of π^{**}_{t+1}:

$$\pi^{**}_{\tau+1} = [1 + \sigma_{t+1} - \beta_{t+1}]/[\beta_{t+1} + \alpha_{t+1} K_{t+1}]$$

where β_{t+1} is the ratio between the MEL^L_{t+1} corresponding to living labor (equation [11]), and MEL_{t+1}, so $\beta_{t+1} = MEL^L_{t+1}/MEL_{t+1} = 0.67/0.5106 = 1.3056$; other ratios defined in equation [14]. Equation [17] is analogous to equation [14], which also shows that a continuous increase in the MEL (reflected by ratios α_{t+1} and β_{t+1}) provokes a continuous reduction in π^{**}_{t+1}. In the limit, as living labor is reduced to zero, the MEL, as well as α_{t+1} and β_{t+1}, become infinite. Hence, "the compensation for the reduced number of workers provided by a rise in the level of exploitation of labour has certain limits that cannot be overstepped; this can certainly check the fall in the profit rate, but it cannot cancel it out."[223]

4.2 Fixed capital[224]

The presence of fixed capital enhances the tendency of the profit rate to fall. Assuming fixed capital, the nominal rate of profit can be defined as:

$$\pi_{t+1} = [P^{£}_{t+1}X_{t+1} - P_t{}^{£}M_{t+1}X_{t+1}]/[\ P_t{}^{£}M_{t+1}X_{t+1} - P_0{}^{£}F_{t+1}X_{t+1}]$$

where $\mathbf{F}_{t+1}$ is the matrix of fixed capital. Let us assume that fixed capital was bought in period 0 and that it does not depreciate. If labor-saving innovations occur during the next t+1 periods, the MEL continuously grows, so that:

$$MEL_{t+1} > MEL_t > \ldots > MEL_0$$

If the MEL grows at a constant rate δ, then:

$$MEL_t = MEL_0\ (1 + \delta)^t$$

In order to obtain the corresponding labor-time rate of profit in period t+1 (π^*_{t+1}), each element of equation [18] has to be converted into a labor-time magnitude by its respective MEL, defined according to equation [20]. This gives:

$$\pi^*_{t+1} = [P^{£}_{t+1}X_{t+1} - (1 + \delta)P_t{}^{£}M_{t+1}X_{t+1}]/[(1 + \delta)P_t{}^{£}M_{t+1}X_{t+1} + (1 + \delta)^{t+1}P_0{}^{£}F_{t+1}X_{t+1}] \qquad [21]$$

Evidently, fixed capital enhances the fall in the rate of profit. Both an increase in δ and longer time until the fixed capital fully depreciates will cause a greater fall in π^*_{t+1}. Equation [21], however, only illustrates this tendency in a qualitative manner, because it does not take into account the structure and the rate of depreciation of fixed capital. In particular, a rapid depreciation of fixed capital slows the fall in the rate of profit.

CONCLUSION

The Okishio Theorem is an erroneous formalization of Marx's law of the tendential fall in the rate of profit because it reduces capitalist wealth to its material aspect, neglecting the dynamic of value. The Okishian rate of profit can be interpreted as a static, nominal rate, measured in symbol-money, which differs from the dynamic, real rate of profit, measured in labor-time. The relation between the two rates is given by the change of the monetary expression of labor (MEL), the quantitative relation between the two poles of value, its substance (labor-time) and its form (money).

This article has illustrated the calculation of both, the nominal and the real rates of profit, analyzing the consequences of a one-time labor-saving innovation in a two-department economy without fixed capital. The resulting augmentation of the productivity of labor raises the nominal rate of profit, but it also increases the MEL. Since the latter effect counteracts the former, it is clear that the labor-saving innovation provokes a reduction in the labor-time rate of profit. The Okishio Theorem takes into account only the nominal rate of profit.

The falling real rate of profit appears externally only through monetary relations. To show this, a monetary system has been considered, in which two types of money have been rigorously distinguished: symbol-money and reserve-money —serving as reserve

[220] See Ernst [1982], p. 88.

[221] It is important to note that, insofar as the existence of symbol-money is considered, this effect is independent of the time at which workers are paid.

[222] Letters on Capital, p. 131.

[223] Capital III, p. 356.

[224] I thank Andrew Kliman, who helped me to express rigorously the intuition behind this sub-section.

of value. As labor-saving innovation raises the MEL, symbol-money represents less labor-time, an endogenous inflationary effect that, eventually, provokes its devaluation against reserve-money. The falling real rate of profit is expressed through the resulting crisis in monetary system. In this simple framework, the rise in the rate of exploitation and the inclusion of a non-depreciating fixed capital have also been considered, as, respectively, counteracting and enhancing factors of the falling rate of profit.

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WAGES, LABOUR PRODUCTIVITY AND UNEMPLOYMENT IN A MARXIAN MODEL WITH ENDOGENOUS MONEY SUPPLY

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Summary

1. Introduction - 2. Monetary circuit and the rate of surplus value - 3. The labour market. Assumptions - 4. The labour market: two cases - 5. Workers' reaction function - 6. The market for goods: three cases - References

1. Introduction

1.1 The aim of this paper is to integrate a wage-productivity direct relationship and a "discipline effect" of unemployment on wages and worker effort into the theory of the monetary circuit, in order to provide an explanation of involuntary unemployment and to clarify certain aspects of the determination of income distribution in a Marxian approach. This paper draws its inspiration from: i) Graziani's models of the monetary circuit (1990, 1994); ii) the macroeconomic models of distribution in a monetary perspective (Bellofiore-Realfonzo 1995); iii) the recent non-neoclassical literature on the efficiency wages theory (particularly Bowles 1985).

1.2 Marxian labour theory of value can be consistently set out in terms of the model of the monetary circuit. Here, money supply is endogenous and the monetary wage is bargained on the labour market while the real wage is determined on the market for goods. Three basic assumptions are superimposed onto a simple model of the monetary circuit: i) the bargained monetary wage depends on the unemployment rate, due to a "discipline effect" on workers' bargaining power; ii) labour productivity depends on the expected real wage, due to the conflict over the determination of worker effort in the workplace[225] and on the level of unemployment; iii) as prices fixed by firms are greater than prices expected by workers (so that the actual real wage is lower than the bargained real wage), workers react by reducing productivity in the ensuing productive process.

1.3 The paper is organised as follows. In section 2, a simple version of the theory of the monetary circuit is described and its links with Marxian thought are shown. In section 3, the assumptions on the working of labour market are made and commented upon, while in section 4 some possible equilibria in the labour market are analyzed. In section 5, workers' reaction function is defined and, in section 6, some possible strategies of firms in fixing prices are shown.

2. Monetary circuit and the rate of surplus value

2.1 In this section we briefly refer to a model of the monetary circuit developed by Graziani[226]. Three classes of agents are supposed: banks, which produce money; firms, which, on the basis of their access to bank money, produce commodities; workers, who supply the labour power. The circuit of the capitalistic economy can be divided into the following logical phases, which go from the opening to the closing of the circuit (sequential process):

a) banks create money in order to satisfy firms' production finance demands (initial finance);

b) firms acquire the labour power;

c) the productive process takes place;

d) workers spend their income on consumption goods and securities (final finance);

e) firms reimburse the initial debt contract to the banks.

2.2 Let us indicate with F the banks' finance to firms. In order to determine the demand for finance, firms bargain money wage, w, with workers. So we have $F=wN$, where N is the number of workers employed. Firms buy labour power and use it in order to produce commodities. Let us suppose, for the sake of simplicity, that firms produce solely consumption goods and that workers have a propensity to consume equal to one. After production has been made, workers spend their monetary income wN to buy goods. We have $wN=Cp_C$, where p_C is the price of consumption goods and C is the number of goods that workers really get, i.e. their real wage. We suppose that firms fix prices adding a margin of profit, q, to the average cost per unit of product, w/p (where p is the average productivity per worker): $p_C=w/p\ (1+q)$. By selling the share $C=W/p_C$ of total production to workers, firms get back the whole initial finance and can pay back their debt to the banks[227].

2.3 In this model firms have exclusive access to bank credit. By making loans to firms, banks create money; money is pure credit, a symbol without any intrinsic value. Money is not a commodity but a condition for the production of commodities. Without money, firms could not buy labour power and the production process could not start. That is why banks' decisions about loans are the logical starting-point of deposits and that is why the banks' potential credit is theoretically unlimited[228].

2.4 According to section 2.3 above, firms could concede whatever workers' monetary wages demand. In fact, banks could finance any monetary wage bill. Assuming a propensity to consume equal to one, firms would always get back the monetary wage bill and reimburse banks (interest apart). On the other hand, firms could fix p_C autonomously determining the real wage (and thus the profit). In fact, the bargaining between firms and workers in the labour market concerns only the monetary wage. Since workers have given expectations about the price level, the advance payment of monetary wage determines a given level of expected real wage. In spite of this, the actual real wage will be known only on the market for goods, after worker effort has been given. The actual real wage is autonomously determined by firms. This means that the real wage expected by workers (the real wage *ex ante*) could be different from the real wage settled by firms (the real wage *ex post*).

2.5 Marx clearly recognised the difference between *ex ante* payment of monetary wages and *ex post* payment of real wages. In our opinion (as put out by Bellofiore and Realfonzo 1995), he preferred to analyse a case in which workers' expectations were confirmed. For this reason, Marx identified the origin of surplus value in the surplus

[225] Bowles and Gintis, 1983; Bowles, 1985. Our treatment of the wage-effort relationship will be different from the conventional one (for example, Solow, 1979), since: i) our focus is not only on a partial equilibrium analysis of the labour market; ii) we assume that monetary variables affect the bargaining process; iii) we do not follow the neoclassical approach in deriving labour demand.

[226] Graziani 1990 and 1994.

[227] For the sake of simplicity, we exclude the problem of the payment of interest to the banks.

[228] See Realfonzo-Bellofiore, 1996.

labour extorted in production in excess of the hours of socially necessary labour to produce the wage goods as expected by workers and confirmed on the market. But surplus labour may also occur due to firms' choices that do not fulfil workers' expectations about real wages.

2.6. Let us suppose that the economic process repeats itself for a number of periods without any alteration in real and monetary variables. In this case, the expected real wage is confirmed on the market and it indicates the value of labour-power, i.e. the hours of socially necessary labour to produce the historically determined subsistence wage. Now, if firms fix prices greater than the expected prices, there would be a decrease in the real wage below the expected level. In Marxian terms, this means that the price of labour-power (the labour embodied in the real wage which the worker actually consumes) is lower than the value of labour-power. In this case, the rate of surplus will be higher relative to the situation where labour-power was paid at its value (for the sake of simplicity, we assume that the potential rate of surplus is always actualised in circulation).

2.7 Workers cannot oppose the price decrease of labour-power by the wage bargaining on the labour market. In fact, they only bargain the monetary wage with firms. Let us suppose that workers later demand an increase in monetary wage that re-establish, at the new level of prices, the desired real wage. Firms will have no problem in conceding the increase in monetary wages. On the other hand, banks will not check the firms' policy of wage expansion as they can make loans without any limit. Nevertheless, if firms do not reduce q, on the market for goods prices will increase again and workers will find their hopes dashed one more. This means that monetary disequilibrium - increase in prices, increase in monetary wages, further increase in prices and so on - may in theory repeat *ad infinitum*. If the reduction of the price of labour-power is confirmed for several periods, the value of labour-power will come down to the new level.

2.8 The only effective workers' reaction is the reduction of effort in the production process. In other words, firms may be in difficulty if they have a problem of extraction of labour from the labour-power. In sections 5-6 we will analyse workers' reactions to the failure of expectations, namely *workers' reaction function*.

3. The labour market. Assumptions

3.1 Let us make the following assumptions:

a) there are n homogeneous firms, producing consumption goods, and N_S homogeneous workers. Aggregate production function is $Q=pN$, where Q is output, p is average labour productivity and N is employment;

b) on the labour market, workers and firms bargain the average monetary wage. Given workers' expectations about the price level, the average monetary wage depends on the unemployment rate: the higher the unemployment rate, the lower the workers' bargaining power, the lower the average monetary wage. The average monetary wage varies from a minimum, higher than zero, and a maximum value, when there is full employment;

c) worker effort - and, consequently, his/her productivity - depends both on the expected real wage and on the level of unemployment: on the one hand, the higher the expected real wage, the higher worker effort; on the other hand, the higher the level of unemployment, the higher worker effort. Labour productivity varies from a minimum, greater than zero, and a maximum, corresponding to the maximum effort s/he can physically and psychologically provide;

d) firms determine the average price of consumption goods by adding a mark-up to the unitary cost of production. The amount of the mark-up depends on workers' reaction and on firms' behaviour over time, as we will show in section 6.

3.2 Let us briefly discuss assumptions *b* and *c*. Assumption *b* can be easily justified on the basis that each worker perceives the real threat of dismissal by firms when unemployment (the industrial reserve army) is high. The strength of this Marxian "discipline" effect of the industrial reserve army over workers' bargaining power is normally dependent on (i) the degree of replacibility among workers; (ii) how costly is for each worker not to be hired (or be fired). As workers become less replaceble and/or as they perceive as less costly the dismissal (for example, because of greater unemployment benefits), their bargaining power grows and, for a given level of employment and for a given expected level of prices, the average monetary wage grows. Since banks can supply limitless credit, there is no limit to monetary wage increases and to the monetary wage bill. Assumption *c* can be justified as follows. Suppose that each worker can choose the level of effort s/he will give to the firm in a interval going from full "cooperative behaviour" (i.e., to offer his/her maximum effort) to full "conflictual behaviour" (i.e. to offer his/her minimum effort). Worker's decision depends crucially on work dissatisfaction, in the sense that the higher the work dissatisfaction, the higher the tendency to conflict. Firms could make workers cooperative by promising them a high real wage (in other words, high wages compensate for work dissatisfaction): wage is a means of controlling social conflict[229]. Since monetary wages are advanced and real wages are known ex-post (once consumption goods have been produced), worker behaviour is affected by the expected real wage. We call this mechanism firms' "*high wages device*". Furthermore, worker effort is also affected by the level of unemployment. This assumption can be easily justified by the usual argument that being conflictual is very costly for a worker when unemployment is high, since firm can easily replace him/her. This means that the risk of job loss - deriving from conflictual behaviour - is higher, according to the level of unemployment and, consequently, it is more convenient for workers to be cooperative. We call this mechanism firms' "*discipline device*".

Let us now consider the equilibrium on the labour market.

4. The labour market: two cases

Case I: firms can control workers' tendency to conflict in the production process

4.1 Given the assumptions *a* and *c*, firms face two kinds of production function: the *technical* (or *exogenous*) *production function* and the *endogenous production function*. The *technical production function*, $Q=pN$, gives a relationship between employment and maximum output. More precisely, it shows the maximum output that can be obtained for any level of employment (given the technology) assuming that workers give maximum effort (i.e. workers have full cooperative behaviour). The *endogenous production function* - $Q=p[w/p^e,UN]N$, where w/p^e is the expected real wage and UN is the level of

[229] See Forges Davanzati, 1996.

unemployment - derives from worker effort and indicates the available sub-optimal allocation of input. In other words, it shows the relationship between employment and the level of output that firms can produce for each value of worker effort. In our analysis the *endogenous production function* is the important production function for firms. In fact, the actual production depends on the worker effort and output is lower than or at least equal to (in the case of full cooperative behaviour) the maximum level technologically feasible.

4.2 In the case here, it is assumed that the high wages strategy is more effective than the discipline device. In other words, monetary wages increase always determines effort increase[230]. Obviously, effort increases will be higher, the lower the discipline effect. As a result, the more workers firms hire, the higher the expected real wage per worker, the higher workers' average productivity. For the sake of simplicity, let us assume that when there is maximum employment, workers are totally co-operative.

4.3 To determine the amount of employment which maximizes aggregate profits, it is necessary to determine the actual (not expected) real wage per worker. In so doing, let us, for the moment, consider firms' mark-up as a given (this assumption will be relaxed in sections 5-6), so that $p=(w/p)(1+q)$ is the average price of consumption goods (where w is the bargained monetary wage). The real wage becomes $w/p=p/(1+q)$. The conclusion is that firms maximize profits (P) by employing all workers. In fact, *since p is maximum when N is maximum* and p is always greater than $p/(1+q)$, we have that $P=Np-N(w/p)=N[p-p/(1+q)]$ is maximum when N is maximum.

4.4 The effect is shown in fig.1. The line w/p^e indicates the expected real wage which is, by assumption, positively dependent on the level of employment. The lines p and w/p indicate respectively the relationship between productivity and expected real wage and between actual real wage and employment for a given mark-up. In the area N-Q the production function is represented. In this case, since worker effort increases as employment increases (as the expected real wage increases), the *endogenous production function* shows increasing returns[231]. If employment exceeds E^* the actual real wage (settled by firms for a given mark-up) will be lower than the expected real wage. This is not a problem for firms since workers choose the level of effort on the basis of the expected real wage. Workers' expectations are confirmed only in the case where w/p^e is equal to w/p; in that point, correponding to E^*, the level of employment causes agreement between workers' demand and firms' decisions. In a sense, this level of employment can be conceived as the only one which allows price stability, or "monetary equilibrium"[232]. But, as seen in section 4.3, firms will maximize profits by employing all the workers. In this case, workers will be completely co-operative and tecnology will be completely exploited (in equilibrium, the endogenous production function meets with the technical production function). Workers' expectations will be systematically dashed and prices and wages will increase non-stop. The value of labour-power will establish itself at the value of the actual real wage. Note that the strength of the high wage effect in relation to the discipline effect affects E^*; in the sense that - for a given bargained monetary wage function - the stronger the high wage effect, the lower the level of unemployment which allows monetary equilibrium.

4.5 Considerations of the results:

a) firms will choose to employ all workers when workers are particularly sensitive to monetary wage increases. This means that workers can easily be "deceived" by the promise of high real wages and nominal wage is an effective means of controlling social confict;

b) if workers' bargaining power grows, expected real wage function shifts upward. This implies that, for each level of employment, every worker will receive a higher monetary wage and consequently will render a higher level of productivity. Firms will continue hiring all workers. In this case it is relevant to stress that the level of unemployment which guarantees the monetary equilibrium could change. It will decrease if the shift of w/p^e function is lower than the shift of the p function (see Fig.2)[233].

Case II: firms cannot control workers' tendency to conflict in the production process

4.6 By contrast with the case below, here it is assumed that the discipline device is more effective than the high wages device. This means that, as employment grows, workers'effort decreases, in spite of the fact that monetary wage increases. It does not necessarily mean that there is no high wages effect, but simply that this is weaker than the discipline effect. In other words, the stronger the high wage effect, the less rapidly labour productivity decreases when employment grows[234]. Since labour productivity decreases as employment grows, the endogeous production function will show *decreasing returns*; theoretically, the maximum level of output could occur for every value of N.

4.7 In this case, it could be convenient for firms *not* to employ all workers. In fact, the endogeneous production function would show decreasing returns (see Fig.3). The level of employment maximizing profits would correspond to the point where output is maximized. Up to this point, in fact, output would decrease, determining - since q is given - a proportional reduction in total profits and real wage bill. If the maximum level of output correponds to a level of employment lower than Ns, as shown in Fig.3, the employment that maximizes profit will be lower than full employment.

4.8 In this case, unemployment is equilibrium unemployment, in the sense that no internal mechanism can allow the labour market to achieve full employment. In fact - by contrast with the case in which firms can control workers' propensity to conflict (sections 4.1-4.5) - now it is convenient for firms not to employ all workers because workers cannot be "deceived" at all. In this case, work dissatisfaction cannot be reduced

[230] That labour productivity increases when monetary wage increases presupposes that workers have adaptive expectations, so that they think that higher monetary wages imply higher real wages.

[231] The endogenous production function has increasing returns in the sense that, as employment grows, average productivity grows *for all the employed*. What we call the endogenous production function is different from the conventional one because for each level of employment, on this function average productivity is *always* constant.

[232] It could be conceived as the conventional concept of NAIRU (see Carlin and Soskice, 1990).

[233] This conclusion casts some doubt on the standard neoclassical view that as workers' bargaining power grows, the NAIRU necessarily grows too (see Layard, Nickell and Jackman, 1994).

[234] Effort reductions - when employment grows - depend on i) the costs of hiring and firing for firms and on ii) the cost of job loss for workers. If workers know it is very costly for firms to hire and fire (i.e., because of the high costs of workers' training), effort reductions will be high; and they will also be high If workers think they could be hired by other firms, or if the government supplies unemployment benefits. Consequently, the higher the costs of hiring and firing for firms and the lower the cost of job loss for workers, the lower labour productivity will be at each level of employment.

by any "carrot". Note that even if the high wages strategy does not affect the level of employment which maximizes profits, however, it does affect E^*, in the sense that the more worker effort decreases as employment increases (i.e., the weaker the high wages effect is), the higher is the level of unemployment which allows monetary equilibrium, for a given bargained monetary wage function.

4.9 Here unemployment is not technological unemployment. This latter case is excluded by assumption, since there is no constraint for firms in choosing the optimal technique. The real cause of unemployment is, consequently, the inadequacy of wage as a means of controlling social conflict. The amount of involuntary unemployment depends on the strength of the discipline effect: the more rapidly workers reduce their effort, the higher the unemployment that maximizes profit will be.

4.10 The conclusions of section 4 are restricted to the assumption that firms' mark-up is exogeneous. Let us now explore the ways in which firms determine this.

5. Workers' reaction function

5.1 For the sake of simplicity, let us consider only the first case described previously (section 4.1-4.5). With a given mark-up, it can be seen that firms would choose to employ all workers. However, in fixing the mark-up firms must consider how workers would react to the possible difference between the actual real wage and the expected real wage. Here, it is reasonable to assume that workers will reduce their effort in the consequent productive period when the actual real wage is lower than the expected real wage. Let us call this phenomenon *workers' reaction function* and let us assume that it works only when the actual real wage is lower than the expected real wage (never the reverse). This is because it is difficult to imagine that workers reward firms with greater productivity simply because firms have not "deceived" them. In a sense, workers' reaction function expresses the intensity of class struggle, because workers' effort reductions are a sign of the existing conflict over distribution. And the degree of workers' reaction (given by effort reduction for a given negative difference between the actual real wage and the expected real wage) is a sign of their actual bargaining power (i.e., the more firms are unable to control worker effort directly or indirectly, the more workers are strong in the bargaining process over income distribution). Furthermore, let us assume that firms exactly foresee workers' reaction. Three distinct scenarios would follow.

6. The market for goods: three cases

Case I: the "hit and run" strategy

6.1 This is the case where firms live *one period* in the economy. Firms will find it convenient to fix a mark-up so as to settle the actual real wage next to zero. This is simply because they are not concerned about what will happen in the following productive period. As a result:

i) firms will employ all the workers;

ii) the difference between the actual real wage and the expected real wage will be maximum;

iii) the difference between the aggregate profits and the wage bill will be maximum, or, in other words, income distribution will be the most unequal one.

6.2 However, the significance of these results is purely theoretical, since, in practice, at least one of the following assumptions must be true: i) if the economy considered is the *world economy*, one must imagine that *all the existing firms* live for one year; this is unrealistic and clearly inconsistent with the working of a capitalistic economy (where capitalists aim to accumulate for indefinite periods); ii) if our economy is a *single open economy*, one must imagine that *all the existing firms* are perfectly mobile, both in a tecnhical sense (i.e., they could produce the same goods and sell them everywhere) and in an economical sense (i.e., other things being equal, the cost of transferring the production process elsewhere is lower than the cost of the reduced productivity deriving from workers' reaction). In a more specific sense, the "hit and run" case can be conceived as an interpretation of the dynamics of economies where a large number of mobile firms (multinational corporations, above all) exist. The result is consistent with the thesis according to which the spread of multinational capital contributed to increasing income inequality and to reducing living standards[235].

Case II: firms' aim is to obtain constant profits over time[236]

6.3 Firms want to respect the condition $DP/Dt=0$. In so doing, they must hold $w/p^e=w/p$ and $DQ/Dt=0$ in order to avoid any reaction by workers[237]. If profits must be constant, it follows that, the output being constant, the wage bill in real terms must be constant too. Since the average real wage cannot be modified (to avoid workers' reaction), the level of employment cannot be modified either. The question then arises: which level of employment allows firms to mantain profits constant over time?

6.4 Let us suppose that the slope of the productivity function is lower than the slope of the expected real wage function. Since firms must fix the actual real wage so as to make it equal to the expected real wage, it follows that the actual real wage function must meet with the expected real wage function (see Fig.4). As a result, because of the lower sensitivity of labour productivity to employment (via real wage) than the sensitivity of real wage to employment, profits decrease as employment grows: firms will find it convenient not to employ all workers. Persistent involuntary unemployment follows; persistent because the condition $DP/Dt=0$ must hold, and thus all the conditions which guarantee it $(D(w/p)/Dt=0$ *and* $DN/Dt=0)$ [238]. Figure 4 shows this situation, as a possible macroeconomic equilibrium. In the area N-w/p, the labour market is represented. Under the assumption that the actual real wage is equal to the expected real wage (because of firms' aim of avoiding workers' reaction), firms will not hire all workers, producing - via the *endogenous production function* - a level of output which gives rise to the aggregate supply (*AS*) shown in the area Q-p (quantity-price). The condition $p^*=p^e$ allows firms to avoid workers' reaction and, as a result, the difference between aggregate supply and aggregate demand (represented by a hyperbole, since it is

[235] See Crotty, Epstein and Kelly (1995),

[236] If firms live for a *finite* period, it could theoretically take place that a "hit and run" strategy would give firms more profits than the strategy of keeping profits constant. This is not the case where firms as a whole live for an *infinite* period.

[237] In the cases II and III, we are implicitly supposing that any reduction in actual real wage determines a reduction in output so that firms cannot keep profits constant.

[238] This conclusion presupposes that the labour supply does not vary through time. For a Marxian approach to the question, see Howard and King (1985, pp.197 ff).

given by $wN=pQ$, in the assumptions that $c=1$) gives firms' real profits. Note that in the area p-p, workers' reaction function is represented for every value of w/p^e.

6.5 On the contrary, let us now suppose that the slope of the labour productivity function is greater than the slope of the expected real wage function. In this case, as employment increases the difference between labour productivity and real wage increases, as do profits. As a result, firms will find it convenient to employ all workers.

6.6 Summing up, the basic results we found are the following. When the mark-up is endogenously determined, unemployment is not caused only by the decreasing returns of the endogenous production function. It also depends on firms' price strategy over time. Even if the endogenous production function shows *increasing* returns, in fact, firms might find it convenient not to hire all workers when they want to keep profits constant over time (here, the necessary condition for unemployment equilibrium is that labour productivity is less sensitive to real wage increase than real wage is sensitive to employment increases). This finding depends crucially on *workers' reaction function*: if workers greatly reduce their effort in response to a negative difference between the actual real wage and the expected real wage, then there is no ground for firms to increase profits by increasing prices. Furthermore, firms' attitude over time affects the rate of inflation and income distribution: the more firms are concerned about their long-run profits, the lower the inflation rate and inequal income distribution will be less inequal[239].

Case III: firms' aim is to obtain increasing profits over time

6.7 Firms must settle employment in order to respect the condition $DP/Dt>0$; since it is not possible to increase worker effort by reducing prices above the level workers expect. The only way to avoid worker reaction and the consequent reduction of labour productivity is to hold the actual real wage constant and equal to the expected real wage. In so doing, firms cannot change any variable and cannot, therefore, achieve their end. In fact, consider the case where the slope of the real wage function is greater then the slope of the productivity function. As in the case II.1, firms will not find it convenient to hire all workers. How can profits be increased over time? Firms cannot reduce the real wage, because this implies a reduction in labour productivity; nor can they reduce employment, since this implies a reduction in expected real wage and consequent reduction in labour productivity; nor can they increase employment, since this implies that short-run profits are not maximized. The only solution is to use technological change: if aggregate production function shifts up, this increases output while mantaining the ratio profits/real wage bill constant. As a result, firms will ask the “social brain” for new capital intensive techniques, generating, in the long run, higher levels of labour technical productivity and higher levels of profits. An interesting consequence of this conclusion is that firms’ behaviour over time can affect the path of technological change. In general, technological change will be driven by the length of firms’ temporal horizon, in the sense that the more firms are interested in future profits, the more the “social brain” will be engaged in finding new capital intensive techniques.

[239]Note that a) in the cases II and III (see below), both the unemployment rate and the inflation rate are constant and b) the level of employment which allows monetary equilibrium is always equal to the employment that maximizes profits in the cases II and III.

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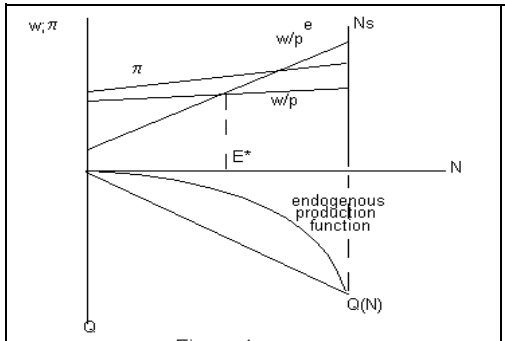

Figure 1

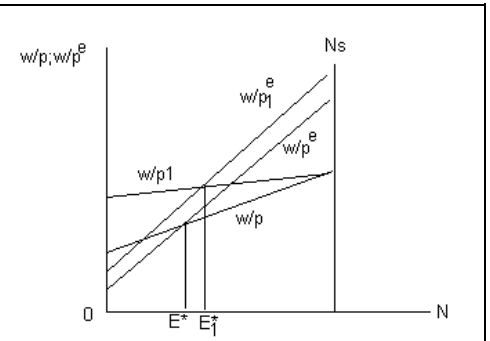

Figure 2

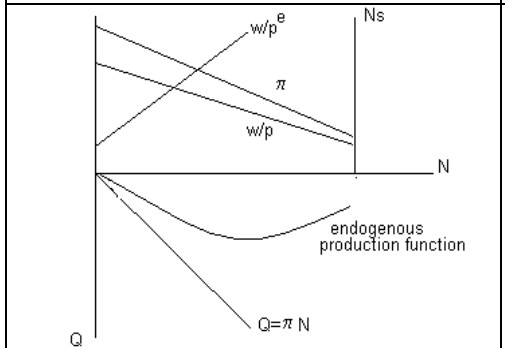

Figure 3

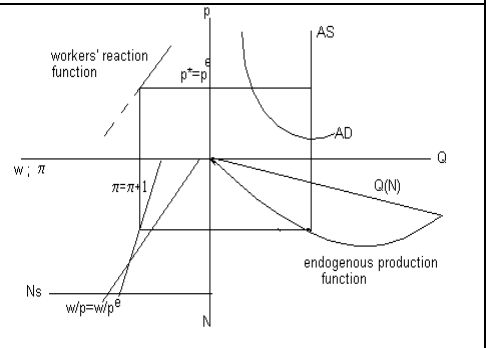

Figure 4

PRICES FOR REGULATING AND MEASURING MARXIAN LABOR VALUES.

Alejandro Valle Baeza[240]

Introduction

> Cain, murderer of his own brother, “committed many other execrable actions, and among these -as Flavio Josefo writes-, 'when he invented weights and measurements, he transformed the innocent and noble naturalness in which the people lived, while they were ignorant of such things, into a life full of swindles.” (Kula, 1980, 3)
>
> To count and to measure is equivalent to sin. The fact that counting -especially persons- is a sin is sustained by the well-known fact that the idea to make the census of the Lord's people was suggested to David by the devil himself. (Kula, 1980, 16)
>
> Measurement is “the process of associating numbers with physical quantities and phenomena” (Encyclopedia Britannica). “Measurement begins with definition of the **measurand**, the quantity that is to be measured, **and it always involves a comparison of the measurand with some known quantity of the same kind**. If the measurand is not accessible for direct comparison, it is converted or 'transduced' into an analogous measurement signal.”[241]

Usually the Marxian Theory of Value (MTV) is presented as an explanation of prices and of exploitation. Most of the time MTV is seen as a failed explanation of prices and as an unnecessary detour for the understanding of prices or even exploitation. This is, in short, the redundancy criticism of MTV. This tendency can be seen in a wide spectrum of theorists: Samuelson (1971), Robinson (1966), Marco Lippi (1976), Howard and King (1985), Steedman (1977) among others. Such an interpretation, I think, is plausible and valuable. Nevertheless I will argue that this perspective is not the most useful for the scientific development of MTV in particular and for economic theory in general. This article accepts that Marx did not properly work out the relationship between labor values and prices. However although Marx's argumentation was insufficient his argument is basically correct: labor values and prices are strongly linked in present day capitalism. There is empirical support for this connection Shaik, 1984, Petrovich (1987), Cockshott, Cottrell and Michaelson (1994), among others have shown a strong correspondence between labor values and current prices. Thus one important problem of MTV is to explain such empirical evidence.

The opinion I will try to sustain is that prices are a **practical way**, in developed mercantile societies, of organizing social labor. To accomplish this, **market prices** must be close to labor values. Market prices gravitate around **production prices**; thus my assertion implies that both set of prices must be close to labor values. This article follows the suggestion of Perry Anderson (1983) that Marxian theory must respond to its

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[241] Emphasis mine

critics by growing and consolidating. To accomplish such an objective in MTV the **redundancy criticism** has to be faced. This article does not aim to be an exegesis of the Marxist theory of value but a new approach to the labor theory of value inspired by Marx, Marxist theorists[242] and measurement theory[243]. My main conclusion is that pricing is a real process of measuring labor values in present day capitalism. Therefore MTV is indispensable for the understanding and transforming of capitalism into a superior form of social organization. Such a proposition is against the accepted thinking of Marx's critics. Even for many Marxists it is necessary to build a new Marxian theory without MTV. My conclusion is the opposite: MTV is absolutely necessary to scientific thinking although it may be necessary to redefine certain elements and to provide more evidence for some of its arguments.

In the first section I will analyze the relationship between exchange value, labor value and the measuring process. The second section is devoted to the problem of justifying measurement and to explaining why it is indispensable to measure labor values in everyday life. These first two sections assert that labor value is far from being redundant and the third is a criticism of the common redundancy argument. The fourth section contains a summary and conclusion.

I Exchange value, labor value and measurement.

In this section it will be sustained that the Classical Theory of Value (CTV) made a great discovery by linking exchange value, labor value and the measuring process. It will be also maintained that CTV inverted the linkage: labor value measures exchange value in CTV, but the correct perspective is that exchange value measures labor value. This idea came from Marx who defined the measurand more carefully than CTV even if more refinement is still necessary.

From Adam Smith's point of view, metals and grains cannot constitute exact measures of the value of other goods.

> Labor alone, therefore, never varying in its own value, is alone the ultimate and real standard by which the value of all commodities can at all times and places be estimated and compared. It is their real price; money is their nominal price only. (Smith, A., 1979, 51)

Adam Smith emphasized:

> The distinction between the real and the nominal price of commodities and labour, is not a matter of mere speculation, **but may sometimes be of considerable use in practice**. (Smith, A., ibid.)[244]

To demonstrate the practical utility of this distinction Smith gives the example of the sale of land for perpetual rent. In these transactions the owners of the property right seek to keep the same real value of their rent, and thus that rent should not be fixed as an amount of money.

The measurement of the exchange value problem was further developed by David Ricardo, as can be seen, for example, in a letter from Ricardo to Say:

> ...You sustain that a manufacturer must make an inventory of everything he possess, rating every article to its ordinary price, to know for sure if the value of its capital has increased. Such a procedure would only inform him whether the value of his capital in terms of money has increased: maybe this would satisfy the manufacturer, but it is not the way in which a political economist must judge the increased value of capital. During the depreciation of our currency (bank notes) **many people thought that the value of their capital had increased while the reality was quite the contrary**, only because it was worth a larger amount of pounds. Money, whether paper or metallic money, can always lose value. Therefore it cannot be a correct measure of the other commodities, over a six-month span.[245] (Ricardo, D. 1963a, 163-164)

Ricardo made a distinction between use value and exchange value, and stressed that the first is an essential condition for exchange value which has "the relative amount of labor as almost exclusively determining the relative value of commodities" (Ricardo, D., 1963b, 10). Even if Ricardo was always concerned with the "other determining causes of the exchange value," the first and second edition of *The Principles of Political Economy and Taxation* did not include the softening words: "almost exclusively." Nevertheless Ricardo finally concluded that labor time had a definitive character in determining the exchange value of commodities. From the beginning of his book, there is an ambiguity in Ricardo, because he defined value as exchange value and labor sometimes as **its cause** and in other places as **its measure**.[246] Ricardo stated that Smith "after most ably showing the insufficiency of a fluctuating medium, such as gold or silver, for the purpose of determining the varying value of other things, has himself, by fixing on corn or labour, chosen a medium no less variable." (Ricardo, D. 1963b, 7) Ricardo underlined the Smithian confusion between the amount of labor applied in production and the amount of labor that can be acquired with a commodity. If what Smith stated were correct,

> ...If the reward of the labourer were always in proportion to what he produced, the quantity of labor bestowed on a commodity, and the quantity of labour which that commodity would purchase would be equal, and either of them might measure accurately the variations of other things ... (Ricardo, idem)

When Ricardo had to face the discrepancy between the "labour bestowed" on a commodity and the labor which that commodity would purchase, he did not find surplus value, instead he discussed the conveniences of one or another measure of exchange value. The relationship between exchange value, labor value and measurement was always important in Ricardo's analysis, appearing in chapter XX of his *Principles*, and it remained as a problem in his unfinished essay "On Absolute Value and Exchangeable Value."

> If we could dispose of a perfect measurement of value, which was not subject to increases or decreases, we would be in condition to find through it the real variations, also the proportional variations of the rest of the things, and we could never attribute the variations of the measured commodity to the commodity that has been used as a measure.(Ricardo, D., 1974, 175)
>
> Any commodity produced with the same amount of labor would be "a perfect measure of value, if the proportion in which the commodities are distributed between wages and benefits were always the same." (Ricardo, D., 1974, 178)

As he had already said in his *Principles*, Ricardo asserted that it is not possible to find any good that is not "itself exposed to the same variations as the things the value of which is to be ascertained; that is, there is none which is not subject to require more or less labor for its production."(Ricardo, D., 1963b, 24). But, even if such a thing were possible, Ricardo concluded that the measure would not be perfect first due to the differences in the rotation periods of capital (this is stressed i*n The Principles*) and

[242] Farjoun, E. and Machover, M. (1983) is enlighten. Also are important Kühne (1979) and Weeks (1981).

[243] For this see the apendix to this paper.

[244] Emphasis mine.

[245] Emphasis mine.

[246] It seems to me that Ricardo is ambiguous on this point because he does not establish clearly the relationship which exists between labour as a cause and labour as a measure of exchange value. Blaug states that while Ricardo affirms that labour is the fundamental cause of exchange value, his theory would lose nothing if this idea was eliminated. The idea that labour can be used as a measure of exchange value would be left to take its place (n.d. pp. 70-71)

second to differences in the distribution of income among social classes (pointed out in *The Principles* and also in "Absolute Value and Exchangeable Value").

Ricardo used a physical analogy to discuss the value measurement problem: when it is a matter of measuring a length, a comparison is used between a conventional standard, a meter (for example, made of wood), and the object under study. If the measurement is intended to determine how temperature changes alter a specific material, for example a piece of metal, then **the conclusion is not independent** of the material used in the standard of measurement. The meter could suffer similar variations to those of the studied material. It may happen that the standard of measurement increased in size more than the material measured, so that the conclusion would be incorrect: we would say that the metal reduced its length with the increase of temperature. Thus the "absolute" enlargement of the metal would be not perceived, because of the characteristic of the standard of measurement employed. It is possible to interpret Ricardo's concern about this point in the light of the actual Theory of Measuring (**TM**). That the object studied and the standard of measure could have been affected by the same variables could be interpreted as the error problem in TM.

Breaking the connection

In CTV the relationship between exchange value and labor value is contradictory because labor value is both the cause of exchange value and the way of measuring it. This weakness was seized on by Ricardo's critics, who took the argument to the extreme that the exchange value is only what it seems to be: a proportion in which commodities are exchanged.

> Value denotes consequently nothing positive or intrinsic, but merely the relation in which two objects stand to each other as exchangeable commodities." (Bailey, S., 1967, 4-5)

Bailey repeated, endlessly, his argumentation: if value is understood to be exchange value, then it is not correct to talk about the measure of value because every good has multiple values; to keep all of them invariable, they should stay fixed, in which case the need of any measure of value disappears.

Bailey did not criticize a more fundamental problem concerning the postulation of labor as a measure of exchange value: labor value is not observable and exchange value is. Thus it is impossible that the yardstick be unobservable and the measurand observable.

If the measurand is exchange value and labor value is the measure Bailey was right: the exchange value of every commodity has a number assigned to it, in money terms, or a set of numbers in relative price terms. According to this there is no necessity to measure exchange value.

Bailey attacked CTV for its logical weaknesses. However other attacks were more political in intent, and soon after CTV was qualified as mistaken and pernicious.[247] Mark Blaug summarized the opposition of the dominant class to the classical theory of labor value:

> "Meanwhile the theory of labor value kept its strength in contemporary thought, the idea that profit is an appropriation of surplus value produced by labor reached the intelligence easily. The growth of industry and the development of a conscious proletarian class was all that was needed to create the argument that the laborers were exploited." (Blaug, M., n.d, 248)

Ricardo's theory caused opposition among his contemporaries. This was clearly expressed by Scrope:

> Of course, the publishing of hastily adopted opinions based on weak and imperfect evidence -opinions that, demolish the principles of sympathy and common interest that keep together society, cannot be less than deeply pernicious, **even if they were true- is equivalent to a crime**. (Quoted in Blaug, M., op. cit., 249)[248]

Even if CTV was initially conceived as a useful tool for the dominant class, it was transformed into something dangerous and criminal from Scrope's point of view.

In the same way counting and measuring was considered a sin, to measure production by the labor embodied in it became sinful, because it was against social harmony.

Reestablishing the link between labor value and price.

Unlike the classical thinkers, Marx did not consider that labor measures exchange value, but that the latter is the measure of the former. Hence exchange value is the necessary form of the appearance of value. Marx gave to human labor in theory the same key role that it has in practice: value is the time of abstract social labor applied in the production of commodities. As Makoto Itoh (Itoh, M. 1980, pp. 47-79) underlined, this idea underwent considerable change during Marx's treatment of exchange value.

> When at the beginning of this chapter, we said in common parlance, that a commodity is both a use-value and an exchange value, we were accurately speaking wrong. A commodity is a use-value or an object of utility, and a value. (Quoted by Itoh, 1980, pp. 51).

It can be said that Marx, as CTV did, confused measurand and measure itself in the first section of chapter 1 of *Capital* and he clearly separated both concepts in third section of the same chapter introduced until the second German edition of *Capital*.

Even though Marx does not use the measurement idea very much, he does introduce it occasionally and at other times it would be easy to interpret his work using such an approach. For example in the third section of chapter 1 of *Capital* entitled "The Value-Form or Exchange Value" Marx used the relations of equivalence exactly as we would in the present day theory of measurement.

Occasionally the measurement concept appears clearly. An example would be his discussion of money as a measure of value in chapter 3 of volume I of *Capital*:

> It is not money that renders the commodities commensurable. Quite the contrary. Because all commodities, as values, are objectified human labour, and therefore in themselves commensurable, their values can be communally measured in one and the same specific commodity, and this commodity can be converted into the common measure of their values, that is into money. Money as a measure of value is the necessary form of appearance of the measure which is immanent in commodities, namely labour-time. (Marx, 1979, 188)

Marx here is considering money as to be a standard of value, hence it should be divisible and so on. He briefly touches the possibility of measuring value directly. Owen proposed to transform labor from a **natural** standard of value to a **practical** standard of value.

> To make labour the standard of value it is necessary to ascertain the amount of it in all articles to be bought and sold. (Owen, R., 1927, 262)

Marx criticized this possibility because in a mercantile society nobody knows the amount of labor embodied in production. This is not only because of the technical difficulties involved in measuring it but because discrepancies between labor expended

[247] See for this Dobb, M. (1975, 125-6).

[248] Emphasis mine.

in production and labor appropriated by exchange is the essence of mercantile production. Money cannot represent labor time directly because in mercantile societies labor is not translatable directly into social labor. Thus it can be said that a great portion of measurement error is inherent to mercantile society and specific to this kind of society.

Marx asserted that Ricardo paid more attention to exchange value (relative value) than to absolute value (labor value) (Marx, 1980, 152). Marx was right on this point and the link established by CTV was partially correct if exchange value is the practical measure of labor value. The measurand is the embodied labor of Ricardo or more precisely the **value defined by Marx**. When a commodity is bartered or sold for money every exchanger considers that the value of both poles is equal. The seller and the buyer are measuring the value of the commodity as equivalent to the value obtained in the exchange. The previous statement is easy to understand for commodity money but with fiat money it is not so easy. The exchanger who sells by fiat money is measuring the value of his commodity by the value of the possible commodities that he may obtain with such money. **Pricing is a form of measuring labor values**.

Defining the measurand

Even Ricardo inverted the measurand and the measure although it may be said he made a great advance in defining the measurand. For him the embodied labor is the direct and indirect labor spent in producing each commodity. This is the first approximation to definition of the measurand. Ricardo also touched on the problem of qualified labor and concluded that such labor affected different industries almost in the same proportion. Therefore the existence of qualified labor does not modify the influence of wages on prices.

Marx made considerable advances in labor value theory. Human labor has to be measured to be organized and the ways in which it is measured together with the errors which accompany this process have real effects. Such errors determine important aspects of our everyday reality. In order to organize labor it is necessary to take into account that the means of production have different useful lives, that the diverse labor processes have unlike efficiencies due to a variety of causes, that the performance of certain tasks is more skilled than others, and so on. These and other problems have to be analyzed in the light of their implications. Some of these implications are briefly analyzed below.

The better defined measurand is the labor value of Marx and not the embodied labor of Ricardo. Marx defined the measurand as value. This is the abstract labor socially necessary to produce commodities. Abstract labor is a requisite of cooperative labor: to consider the total amount of labor expended in the production of a particular commodity as a portion of social labor. Obviously this aspect of value is closely related to Ricardo's embodied labor. However Marx has reflected more deeply than Ricardo in his analysis. This can be seen when he asserts that in mercantile societies it is necessary to reduce concrete labors to undifferentiated human labor. All the ramifications of the value concept will not be discussed here. We will restrict ourselves to the concept of socially necessary labor. Marx refined the Ricardian idea of embodied labor:

> It might seem that if the value of a commodity is determined by the quantity of labor expended to produce it, it would be more valuable the more unskillful and lazy the worker who produced it, because he would need more time to complete the article...
>
> Socially necessary labour-time is the labour-time required to produce any use value under the conditions of production normal for a given society and with the average degree of skill and intensity of labour prevalent in that society. (Marx, 1979, 129) Socially necessary labour-time is the labour-time required to produce any use value under the conditions of production normal for a given society and with the average degree of skill and intensity of labour prevalent in that society. (Marx, 1979, 129) Socially necessary labour-time is the labour-time required to produce any use value under the conditions of production normal for a given society and with the average degree of skill and intensity of labour prevalent in that society. (Marx, 1979, 129) Socially necessary labour-time is the labour-time required to produce any use value under the conditions of production normal for a given society and with the average degree of skill and intensity of labour prevalent in that society. (Marx, 1979, 129)

Normal conditions of production involve "the level of development of science and its technological application, the social organization of the process of production, the extent and effectiveness of the means of production, and the conditions found in the natural environment." (Marx, 1979, 130). As the products are sold at the same price productivities superior to the average are rewarded and lower productivities penalized. This mechanism punishes laziness and rewards industriousness. The capitalist society gives this same treatment to natural disadvantages, insufficiency of capital accumulation, etc. We will examine this latter because it is necessary to focus on the other basic aspect of Marx's definition of value: the measurand. Marx asserted that "*substance*" of value is labor and that the "*measure of its magnitude*" is "*labour-time*." (Marx, 1979, 131). According to Marx we have one measurand: value and two measures: price and labor time. At the very least this seems confusing if not contradictory. However this could be interpreted in the same way that a chemist sometimes uses a direct measurement for concentration (a quantity of some dissolved substance per unit of volume) and in others circumstances uses an indirect measure as in the case of light absorbed by the solution containing the substance under examination. It is possible to use prices in capitalist or market socialist societies and to use labor time in planned societies. To give only one price to each commodity is to treat all differences of productivity in the same way. It is to consider each commodity as produced by an average amount of labor. Thus the measuring process is a social and historically determined activity. It would be possible to treat laziness and natural disadvantages differently. We could average the labor spent in the first case and not in the second. A second problem of measuring value by prices implicit in Marx's definition of socially necessary labor may now be considered. This is the case of the reduction of skilled labor to simple or unskilled labor. This problem has been considered unsolvable by Marx's critics. A recent example may be found in the work of John Elster (1986). Marx's solution is to reduce skilled labor to simple labor by considering labor spent in training (Meek, 1975, 157-200). However it seems to me that capitalism reduces skilled labor to unskilled labor paying different wages rates not in proportion to training time[249]. As in the previous case there are at least two different solutions for each problem related to MTV. There is a capitalist solution and one related to a planned society.

Marx's definition of socially necessary labor focusses on the following:

[249] Wage differences -some five times the amount of others- which often occur within countries cannot possibly be accounted for by differences in time spent in training. For example if a member of a given profession spends half his working life in training then one hour of his work should -according to Marx- be valued at twice that of an unqualified worker. On the other hand, the indirect labour spent in training may not necessarily be reflected in the wage of the worker who has benefited from it. This is reinforced by the fact that there are important and persistent salary differences between workers who have the same qualifications. See Botwinick (1993).

a) There is a **practical** social necessity that must be satisfied, skillfulness and industriousness should be considered in organizing social labor.

b) Such a necessity is solved in capitalist society by the pricing mechanism.

c) To understand the practical implications of the capitalist solution to this problem the concept of labor value is absolutely indispensable.

d) Using labor value as a basis it is possible to find another solution to the economic problem.

Even Marx's definition of the measurand is not complete. Like his discussion of the reduction of skilled labor to simple labor, it leads to a critical evaluation of the capitalist solution and suggests that another kind of solution may exist which would be more useful to human beings. There is an obvious necessity to find a solution to the problem of reducing skilled labor to unskilled labor in order to resolve problems like the comparison of techniques.

In general given that Marx's definition of the measurand is incomplete, three attitudes are possible:

a) To declare the problem unsolvable (a position very frequent with Marx's critics).

b) To accept without any further consideration Marx's solution when such a solution exists (the dogmatic position).

c) To analyze Marx's proposition and to refine or modify it to fit particular situations (The fruitful attitude).

The process of measurement in a capitalist society is pricing and this measures labor value. However all processes of this sort involve error.

Measurement and error.

The second element from measurement theory that is implicit in CTV and in MTV is the error problem. In current literature it is accepted that all measurement involves error. Length without error is an abstract idea. Therefore any observable length must be interpreted as the real length plus (or multiplied by) an error term. Market prices or current prices are observable but natural prices are not. The latter are the gravitational centers of the former, so that it is possible to understand market prices as natural prices modified by an error term. But this interpretation is in conflict with the idea of labor as a measure of exchange value because there are many exchange values and there is only one measure.

Understanding error is easier if it is interpreted as the measuring link between exchange value and labor value in the very opposite way proposed by CTV. If price is the measure of value, which is the thesis of this paper, the value of every commodity can be measured by money (price is the monetary expression of value Marx *dixit*[250]). Indeed it can be measured by any other commodity in the same way that length or temperature can be measured using many different standards. In the same perspective there are two kinds of error: systematic errors such as production prices or absolute rent deviations and random errors caused by supply-demand discrepancies. It is possible to analyze, for example, deviations between production price and labor values as errors. These errors have a distribution with a mean of zero for an additive error term (or mean 1 for a multiplicative error term), as Marx implied, and it is possible to calculate the standard deviation of such a distribution. Marx concluded that the deviations explained by systematic discrepancies between labor values and production prices are small.[251] This last statement is ambiguous. Small could have very different meanings in different problems. For example in spectrometry an additive error of 10^{-8} may be admissible and in stellar magnitudes a multiplicative error of 10 might be reasonable.[252] In all measuring processes admissible error is defined in terms of the purpose of that process. As we discussed above CTV were concerned with practical problems. Therefore the problem of error should be discussed in CTV when the motivation for measuring something becomes a topic for discussion. Considering prices as measuring labor values helps us to understand why errors are unimportant for one aspect of the analysis and become central in another part. This is the point of ignoring systematic errors in volumes I and II of *Capita*l and giving them a central role in volume III. With gold currency and production prices that diverge from labor values the loss or gain of the seller is exactly offset by the gain or loss of the buyer. Multiplicative errors average one over time. Thus investigating the origin of the surplus in capitalist society can be carried out ignoring the discrepancies between values and production prices:

> The formation of capital must be possible though the price and the value of a commodity are the same, for it cannot be explained by referring to any divergence between price and value. (Marx, 1979, 269)

Where error is considerable is necessary to understand consequences of this. Ricardo and Marx asserted that discrepancies between labor values and production prices are small. Ricardo's assertion that labor explains 93% of exchange value is well known. In the same way Marx wrote:

> In whatever way prices are determined, the following is the result:
>
> (1) The law of value governs their movement in so far as reduction or increase in the labour-time needed for their production makes the price of production rise or fall. (Marx, 1981, III, 280)

According to Marx a fall in the labor value of a commodity usually occurs with a rise of the organic composition of the capital producing the commodity. The rise in organic composition should increase the production price while the fall in labor value diminishes the production price. Therefore if Marx's assumption is generally true it implies that the organic composition effect is smaller than the labor value effect most of the time.

This assertion was not proved by either Ricardo or Marx but empirical evidence suggests it may be valid (Shaikh, 1984). Our interest here is to point out that considering price as a measure of value is consistent with treating discrepancies between labor values and production prices as systematic errors. The analysis of errors leads to understanding the practical necessity of measurement.

Summarizing this section:

1. Prices should be interpreted as a measure of labor value.
2. Discrepancies between labor values and production prices should be interpreted as systematic errors in measuring the process of labor values.

The second aspect of measurement remains to be analyzed. This is the link between values and prices: why should labor values be measured?

[250] The idea of monetary expression of value is in Foley (1982) Vroy, De (1981).

[251] Marx suggested this from my point of view see below.

[252] See the very interesting article of Kuhn (1987, 202-247).

II.Why should labor values be measured?

Adam Smith stated clearly the problem of the conservation of value through time. Precious metals do not preserve their value in time; therefore -extrapolating- contracts could be made based on units of wages, **as is done on many occasions today**. Ricardo established that the measurement of value from the scientific point of view requires the inclusion of reality and he built his conceptual tools for that purpose. Ricardo and Smith did not address themselves enough to answering the question of why measurement is necessary. Marx even though he did not treat the question explicitly left many clues for the solution of this problem.

We find the outlines of three basic ideas in Marx:

a) Any type of society is obliged to produce its material conditions of existence, and must organize its social labor. We will call this the process of the regulation of social labor and it is a problem common to all types of economic system.

b) The regulation of social labor requires the measurement or calculation of the labor time spent on the production of different commodities.

c) The regulation of social labor has different historical solutions: independent primitive communities, slavery, feudalism, and so on. Capitalism is one system of social labor regulation in which the measurement of social labor is done unconsciously, and in which measurement error is used for regulation.

To develop these three ideas, let us begin with the concept of regulation which is our main interest.

1. Regulation and measurement of social labor

Regulation means:

> The control or adaptation action of an output to a desired value in terms of an input.

The problems of regulation are studied in many disciplines, perhaps the most similar to those in economy[253] are to be found in biology, and that science provides us with a useful example of the phenomenon. To regulate temperature, the brain reacts to changes in body temperature, and orders actions to maintain it within a certain range: it increases perspiration to cool the body down or contracts the blood vessels to avoid heat loss. To regulate temperature, it is necessary to establish a relationship between the "errors" or deviations (the difference between current temperature and vital need temperature) and the corrective actions. To a greater deviation there must correspond a more intense correction than to a minor deviation. The perception of the deviations is an essential element for regulation; a second element is a repertoire of corrective actions related to the errors. In this example, the process occurs automatically and unconsciously. We could say that the regulation of the body's temperature is an unconscious process in which the deviations of the temperature of some magnitude are related to some corrective actions.

The control systems are not perfect because they require deviations of some magnitude to react. If the environmental temperature exceeds a certain value, our organism has no way of maintaining the body temperature within the vital limits and so we die. Within the range that the thermic regulation system operates, it is essential that the brain is informed about the temperature; it would be nonsense to pretend to regulate it without any information about temperature. Also, it would be impossible to talk about regulation without a repertoire of corrective actions. The efficiency of the control systems depends on the measurement of the variable to be controlled, and on the ability to act on it. Difficulties of different types may arise when designing a system of regulation. For example, the regulation of heat in a metallurgical oven raises different problems of measurement than those implied in a kitchen oven for cooking. Corrective actions to regulate the temperature in a domestic oven are minimal in comparison to those of a nuclear reactor. However, the measurement of the variable and the "reaction" to the errors is always the same. If, for example, in a control system one of these was absent, there would be no control.

If a problem such as the temperature regulation of an organism can seem so complicated, what can we say about the problems of social labor regulation? The social organism is very complex and presents very different control problems. One of the most important regulating variables is a worker's labor.

> ..The law of the value of commodities ultimately determines how much of its disposable labor-time society can spend on each kind of commodity. But this constant tendency toward equilibrium comes into play only as a reaction against the constant upsetting of this equilibrium. (Marx, K., 1979, I, 476)

In a hypothetical society, conformed by free laborers,

> Labor time would play in that case a double part. Its apportionment in accordance with a definite social plan maintains the correct proportions between the different functions of labour and the various needs of associations. On the other hand, labour-time also serves as a measure of the part taken by each individual in the common labour and of his share in the part of the total product destined for individual consumption. (Marx, K., 1979, I, 172)

In this quotation, and in other parts of his work, Marx outlined a vision of the organization of social labor as a regulated system. What should be produced in common? How much should be produced? How should the product be distributed between the members of the society? How should the best technique be chosen? With these questions we are signalling vital factors of social labor regulation.

When we assign the means of production and the amount of labor to the different branches of production, the amounts of different commodities that can be consumed at present, and in some way into the future, are determined. The goods that can be consumed now must be distributed between the producers so that labor is not wasted. The fact that there is a need to socially regulate human labor does not imply that all labor is regulated in the same way. **For example, domestic work is indispensable labor that is not regulated through measuring**.[254]

Marx said that it is important to distribute social labor in relation to the volume of social needs, and this is the role of the law of value. What is the volume of social needs? One might think that it would be a list of everything necessary to survive. Nevertheless, such a list would not have any relationship to actual human capabilities and knowledge. From the extensive set of needs there would be a subset of what is possible after taking into account the restrictions imposed by the availability of labour. **Only by establishing needs in terms of labor would it be possible to determine the feasible consumption region** of a society and choose the amount of required needs. It makes no sense to pose

[253] There is a whole movement which originated in France named "Regulationist". None of the contents of this article has an intentional relationship with that school. To see more about this school, there is an excellent resume in Boyer, R., "Technical Change and the Theory of 'Regulation'", CEPREMAP, March 1987.

[254] A very interesting perspective linking MTV, domestic labor and gender is in Laibman, D. (1992, chap. 3)

the problem of how much clothing, food, etc. to produce if this is not selected from those combinations which are feasible. Therefore, the variables would be the amounts of social labor that could be assigned to the production of the different goods, given certain technical circumstances. These could be modified, but not at will; they are **data** for labor regulation. **When the technical conditions in a society are changed, it is important to consider the labor that the new techniques require and then decide if they are convenient or not for society**. If a new technique requires more labor for the same results than a previous one, it implies a loss for someone if it is adopted. It is almost impossible for any society to judge this as correct. This is so even if the mistaken decision is adopted in a class society and the cost of the mistake will be paid only by the dominated classes. Another aspect of the regulation of social labor is the establishment of the quantity of means of production. Let us suppose that the amount of goods for human enjoyment that can be produced with current technical knowledge is set. That does not mean that this amount can be produced immediately. It may well be that the supply of means of production must be increased before society is in condition to produce the desired quantity. So, labor will have to be transferred from the production of current consumption and dedicated to future consumption. The effect of such an effort can only be understood in terms of labor. Finally, the consumer goods must be distributed among the producers. To do this it is indispensable to account for individual labor time, and to establish the relation with the labor that is required to produce different goods. In a society of free men and women the product could be divided according to individual needs, but even in this case the calculation of labor time would allow for a clear understanding of the nature of distribution. If one production unit receives goods that cost double its labor time, the other units would receive less.

To regulate social labor means to assign social labor to accomplish certain established goals in terms of social labor time, and for this to take place one requirement is to measure the social labor spent in the production of different commodities.

Capitalism is a form of regulation of social labor where it seems that the goals in terms of social labor are not established. Apparently what we have said above can refer to a primitive autonomous community or to a planned society of the future, but not to capitalism. But it is impossible for capitalism to be a form of progressive production without resolving, with some degree of efficiency, all the above mentioned problems. To substantiate this idea we must analyze how these problems are resolved in an unconscious way within capitalist society. In the same way that we regulate unconsciously the temperature of our bodies, the social organism regulates collective labor. To support our argument, we should discuss each of the above problems one by one. However limitations of space do not permit this here. Instead, we will discuss the problem that seems to be the clearest for us: the choice of techniques. We propose to examine why the selection of technique should be made in terms of labor, and how that solution is approached in capitalism.

2. Choice of technique and the measurement of value

We will argue:

a)to choose the better of two different techniques it is necessary to take labor value into account,

b)the right choice of technique cannot be made by using the accounting of physical units,

c)capitalist accounting, profitability, fails to choose the best technique in some circumstances.

In first place, I will argue my points using a numerical example. Assume a pure corn model where 0.4 tons of seed and 0.6 of a worker-year are necessary to produce 1 ton of corn per year. I call this technique A. If technique B is available and requires 0.2 ton of seed and 1 worker-year to produce 1 ton of corn, it is a problem of economics to decide if technique B should replace A or which of these techniques is the best.

First, in terms of physical accounting, it is impossible to say if technique B is better or worse than technique A because the second requires less seed but more direct labor than the former. Thus in physical units it is impossible to choose the best technique. Now in labor value terms, technique A produces corn with value $m_A = 1$ worker-year/ton, but technique B will result in $m_B = 1.25$ worker-year/ton. Thus production possibilities will be reduced with the second technique, and society will be impoverished if technique B is chosen. In a pure corn model, production per employee and consumption per employee are both equal to $1/m_i$, this variable is the reciprocal of the value of corn. It is impossible to derive similar conclusions from physical unit accounting **even in a pure corn model. Thus the meaning of the development of the productive forces is the reduction of labor values**. The previous affirmation cannot be expressed in physical terms. Let us examine the capitalist choice of technique with the same numerical example.

Capitalist Choice of Technique

If the wage rate is 0.4 ton per year and assuming that all the wage is paid in advance.[255] The profit rate for technique A would be:

$$r_A = 0.36/(0.4+0.24)= 56.25\%$$

For technique B the new rate of profit would be:

$$r_B = 0.4/(0.2+0.4)= 66.67\%$$

Given that the new technique is more profitable, capitalists will adopt it. With this selection, capitalists **will adopt a regressive technique** because the labor value of corn with the first technique would be 1.0 worker-year per ton, and with the second technique labor value would increase to 1.25 worker-year per ton. Here the more profitable technique means more labor value per unit of product. The explanation for this is, that the price of the labor force takes into account not living labor but paid labor, and the latter should be lower than the former to obtain a capitalist surplus.

In this example the well known switching of techniques occurs. If the wage is greater than some critical wage rate w_1 then technique B becomes less profitable than technique A, so that the capitalist choice of technique becomes equivalent to a choice based on labor value. So there are two regions, one where the capitalist choice of technique is wrong being based on production of corn per worker if $w<w_1$ and the other where it is right if $w>w_1$. The NeoRicardians criticized Neoclassical theory because the reswitching of techniques occurs (Sraffa, 1960). But according to the former analysis, **even the switching of techniques is a practical problem**. It represents the possibility of a wrong capitalist choice of technique based on prices that do not take into account the real social

[255] All calculations are made in corn i. e. in price terms.

cost but the capitalist cost of production. The most profitable technique for $w>w_1$ is B. This implies a greater cost in terms of direct and indirect labor, i.e. a higher social cost. Nevertheless, it represents less cost in corn per unit of product and therefore less capitalist cost. This occurs because wage is the monetary expression of paid labour and not of direct labour.[256] Thus it may happen that if constant capital is economized and more money is spent in variable capital the result may be a higher labour value per unit of product. This is an intrinsic error of capitalist production in the measurement of the labour used. It is worth emphasizing that this error will have a regressive effect only when technical change implies a decrease in the organic composition of capital. When the technical change comes about through a rise in the organic composition of capital, the error by which direct labor is measured may imply that the decrease in the labor value of the product may be greater than was estimated in monetary terms. Thus, this may lead to the non-introduction of a convenient technical innovation but not to technical regression. Marx broached this idea when he pointed out that American wages being higher than those in Britain a situation had arisen whereby Britain was producing machines to be sold only in the United States (Marx, 1979, I, 516). However, Marx did not go on to state that Britain was wasting an opportunity to use a technique which would reduce the value of the product. He also missed another possible reading of this situation: a lowering of salaries within one country may lead to the adoption of regressive techniques. This occurs in our numerical example.

As far as we know, the marxist literature on technological change concentrates on such things as the problems of the law of the falling rate of profit or whether the organic composition of capital rises or not (for example, Laibman, 1992). Schefold asks: How does productivity increase as a result of technical progress? (1986, 252) when he analyzes the relationship between fixed capital, accumulation and technical progress. His answer to this question lacks clarity because he accepts the existence of different kinds of productivity. On this point the NeoRicardian literature can only treat the choice of technique in terms of prices. It is therefore unable to include the idea that technological regression may result from capitalists following the criterion of profitability.

A second aspect of capitalist choice of technique is that, if prices of inputs are not proportional to labor values, reducing monetary costs is not the same as reducing labor values of inputs. Since this cannot be analyzed with the pure corn model, some generalization is necessary.

The Case of n Commodities

The previous analysis can be applied to an n commodities case. It can be showed that:

$$\mathbf{ZM} = 1 \qquad (1)$$

where **M** is a row vector of labor values[257], **Y** is a column vector of final demand in physical units, **Z** = **Y**/**LX**, that is, the vector of net product per worker, and **L** is a row vector of labor requirements per physical unit of gross production.

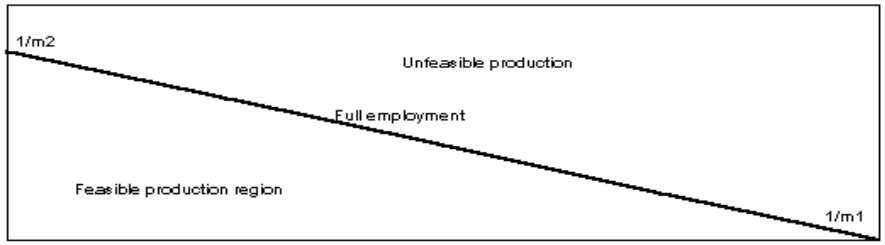
Expression 1 defines a straight line in a n-dimensional space, **which defines feasible production with full employment** and divides the commodity space into two regions:

a) an unemployment region: below the straight line there is a region of feasible production with unemployment.

b) unfeasible production: above the line lies the region of unfeasible net product per worker.

Figure 1 illustrates the production possibilities for a two- commodities case (put figure 1 near from here). It is obvious that equation (1) also defines the possibilities of consumption per worker. So the reduction of the value of at least one good, increases the possibilities of consumption. From this it follows that a correct choice of technique increases the consumption per worker, and on the contrary, a wrong choice of technique diminishes the possibilities of consumption. There is no problem in applying a choice of technique based on labor values to an n commodities case. In the general case, as in the pure corn model, it is impossible to choose a technique based on physical quantities (real terms).

Figure 1
Labor value and production feasibility



Depending on the wage rate, the capitalist choice of technique in the general case will be wrong in one region and right in another. Right means to select a technique that improves consumption per worker in at least one commodity; wrong has two meanings: i) capitalists choose a technique that diminishes consumption per worker, ii) capitalists reject a technique that will improve consumption per worker.

Capitalist choice of technique will be wrong or right not only because of differences between labor and paid labor, but also because of differences between prices and values. If current prices of commodities p_i are different from prices proportional to values[258], capitalists will make a right or a wrong selection of technique. But even if prices are proportional to labor values capitalist may make a wrong choice of technique because living labor must be underestimated to obtain a surplus.

The correct choice of technique in industry j requires:

$$\mathbf{M_1 a_1}^j - \mathbf{M}_0 a_0^j + l_1^j - l_0^j < 0 \qquad (2)$$

where subscript means time, and a_0^j is jth column of **A** in time 0, l_0^j is direct labor coefficient for industry j in time 0. The meaning of (2) is simple: a better technique requires that labor value should diminish.

[256] This was pointed out by Marx (1979, I, 515)

[257] As usual $\mathbf{M}=\mathbf{L}(\mathbf{I}-\mathbf{A})^{-1}$ where **L** is a row vector of labor coefficients and **A** is the input-output matrix in physical terms.

[258] From my point of view, for a price comparison to have any meaning both prices must belong to vectors $\mathbf{P}_1$ $\mathbf{P}_2$ such that the value of money ß is constant. In addition if **P** = ß**M**, prices are value-prices, "prices equal to values" in Marx's words.

The previous decision in price terms, with perfect information (i.e. prices after new technology), requires:

$$\mathbf{P_1}\mathbf{a}_1{}^j\text{-}\mathbf{P}_0 a_0{}^j + w_1 l_1{}^j - w_0 l_0{}^j < 0 \quad (3)$$

where $\mathbf{P_0}$ is a row vector of current prices and w_0 is the wage rate.

If prices are considered as a measure of value, it is necessary to interpret $\mathbf{P}_1=\alpha_1\mathbf{M}_1<\boldsymbol{\varepsilon}_1>$ and (3)should be rewritten as:

$$\alpha_1\mathbf{M}_1<\boldsymbol{\varepsilon_1}>\mathbf{a}_1{}^j\text{-}\alpha_0\mathbf{M}_0<\boldsymbol{\varepsilon_0}>a_0{}^j+;_1\alpha_1 l_1{}^j\text{-};_0\alpha_0 l_0{}^j < 0 \ (4)$$

where α_1 is the monetary expression of value defined by **MY**/**PY** in time 1

$<\boldsymbol{\varepsilon_1}>$ is a diagonal matrix whose element $\boldsymbol{\varepsilon}_{i,i}$ is error term for price i

$;_1\alpha_1 l_1{}^j$ is labor cost for industry i

$;_1$ is the wage share in time 1.

In addition, Ricardo asserted in his answer to Say that measuring capital in money terms might be enough for a manufacturer but not for a political economist. Neither of them would be satisfied today with this kind of measurement in order to select a technique. It can be shown that if prices are proportional to labor values, the usual deflation would eliminate changes in the monetary expression of value α_0. Even eliminating errors caused by inflation, measurement in terms of prices would not be accurate because of the errors $<\boldsymbol{\varepsilon}_i>$ and $;_i$. The influence of the wage share in the determination of prices should be seen as an error which causes the underestimation of labor costs.

Therefore expression (4) illustrates quite well the idea of prices measuring labor values although with error. This is common to all measuring processes.

The choice of a technique requires us to determine wich is cheapest measured in terms of labor value. Economic growth is possible if capitalist society selects, most of the time, techniques that reduce labor spent in production. With an explicit accounting of labor values, an efficient selection of technique is possible. However, capitalist society calculates profitability based on prices and does not consider labor values. Nevertheless, capitalist society has made the right choice most of the time. What is the explanation of this? It **is due to the fact that capitalist accounting approximates to accounting in labor value terms**. It is suggested here that prices are very close to labour values in present day capitalist societies. Therefore, most of the time, the choice of a technique based on prices will produce the same result as one based on labour values. **Because prices measure labor values, decisions in price terms are analogous to decisions in value terms**. This seems to occur despite the fact that to select a technique only paid labor is taken into account. The reasons for this may be that, in capitalism, organic composition usually rises and it has been shown that in this case the underestimation of direct labour on the choice of techniques will not have negative consequences as if organic composition of capital would decrease. In the case of rising organic composition of capital the underestimation of living labor has as a result that capitalist neglect a technique that would increase consumption per worker and do not adopt a technique that would reduce such consumption.

III Redundancy argument

The previous two sections argue that measuring and regulating labor values is a necessity in capitalist economies. This section is devoted to explaining why intelligent people believe that labor value is redundant. Two answers are given: redundancy seems reasonable and its defenders confuse mathematical determination with real determination.

It seems that Marxist theory can be easily upheld without considering the relationship between prices and labor time. This is both because the labor theory of value gives impulse to the criticism of capitalism, and because the regulation of social labor is carried out without a conscious measurement of labor time. Bailey's criticism of the labor value theory was continued by neoclassical theory (Samuelson, 1971, 399-431) which considers prices only as preference orders, and the Neoricardians (Steedman, 1977) who understand prices to be the result of the technical conditions of production. The latter have elaborated the most complete criticism of the necessity of value for explaining prices. Neoricardians claimed that labor values in Marxian economic theory are redundant:

> Marx's value reasoning -hardly a peripheral aspect of his work- must therefore be abandoned in the interest of developing a coherent materialist theory of capitalism. (Steedman, 1977, 207)

The choice of technique is a good example of the Neoricardian criticism: a) Capitalists choose techniques to maximize profits based on prices of inputs. b) Only after that selection, are labor values determined. Therefore, according to Steedman (Steedman, 1977, 65), labor values do not play any role in the choice of technique.

Lippi arrived at the same conclusion of redundancy by making a very refined critique of MTV (Lippi, 1976). He criticized Marx's idea of linking exchange value and labor value both because of their insufficiency and also because the link leads to contradictory results (for example in the transformation of values to production prices.) Lippi gave his implicit “naturalism” as an explanation of Marx's failed intent to relate exchange value and labor value (Lippi, 1976). Like Neoricardians, Lippi concluded it is necessary for Marxian economics to abandon labor value.

I agree with Lippi that Marx's argumentation linking exchange value and labor value is insufficient. So this article is an response to his critique.

The reply to the redundancy argument is the following: measuring labor value is a practical necessity for regulating social labor. It is impossible to reproduce capitalist society without the regulation of social labor. For example if capitalists choose techniques that reduce the labor value of products, they make the right choices. To reduce labor values is a practical need. To reduce costs in price terms is an imperfect way of accomplishing this. For this reason, labor values seem redundant in capitalism, but this illusion should be unmasked in theory and in reality. Here it is argued that prices measure values with some error, which is necessary for the reproduction of capitalist society. However, this in some circumstances involves serious obstacles to reproduction. In a planned economy, prices that distort labor values must be redundant: for example, it would be possible to use labor values to organize social labor, and workers would be aware of the labor time consumed by society and surplus time destined for accumulation. So a social practice that considers redundant prices as a distortion of values is necessary, in order that the money form of value should disappear. But in capitalist society things make their appearance upside down, so that labor values

seem redundant. Nevertheless, the arguments against the necessity of value concepts seem strong. Why is this so? It is because the mathematical expression of problems seems irrefutable. The basic support of Steedman's criticism of the redundancy of value is that it is possible to construct a model to determine production prices with inputs in physical units. Most of the literature uses a model with the same inputs in physical units to determine labor values. Thus -concludes Steedman- labor values are redundant because it is unnecessary to obtain values from physical data and therefore production prices. **This criticism confuses real determination with mathematical determination.**[259] It is possible to calculate the exchange rate from Mexican pesos to Indian rupees by converting pesos into US dollars, and then dollars into rupees. But it does not mean that is possible to convert Mexican pesos into rupees without the previous conversion to US dollars. This is a practical fact. Exchange from pesos to dollars and from this to rupees reflects a practical necessity, this is **real determination**. The direct conversion from pesos to rupees is possible only theoretically and this is a mathematical determination. The conversion from pesos to dollars is redundant only in logical terms. To increase the consumption per employee of a certain good, it is necessary to reduce the labor time spent in its production. This can be accomplished by reducing living labor or the labor spent on the means of production or both. This economic proposal can not be reduced to a proposal using only concepts in physical units, because for example, an improvement in conditions of production means nothing without labor time.

IV Summary and conclusions

For this we have examined the relationship between measurement and labor value. First, we have seen that the classical theory of value treats social labor both as the cause of exchange value and as the measure of it. We argued that in the classical approach, social labor measures exchange value because of the need to solve practical and theoretical problems. Marx turns the terms around when he criticizes capitalist economic practice and theory: price is a measure of value that makes regulation of social labor possible. To accomplish this, market prices must be close to labor values. According to Marx, labor value is the measurand and price is the measure. The human activity that reproduces the society's material living conditions is largely based on labor with a high degree of cooperation, and that requires a regulation that demands measurement. As in any other process of measurement, prices measure labor values with errors: systematic and random. Deviations between labor values and production prices are cases of systematic errors. Discrepancies between current prices and production prices are random errors. These errors are in some way necessary for the capitalist reproduction of society. Nevertheless, they are at the same time obstacles to this reproduction.

We illustrated this through the problem of selecting a technique. Marx argued that to develop the productive forces means to save labor time. Capitalists reduce monetary costs to obtain a larger profit. The Neoricardian theorists thus infer that theory can be valid even without the concept of labor value. But the important thing is capitalist practice. The material progress achieved up to date by capitalism is due to the saving of labor time in the production of a larger amount of commodities. So the theorists may ignore the concept of labor value but the capitalists are compelled to diminish the labor value of their products.[260] They are not aware of it but they do it. In the same way some Australian indigenous people procreated even though they were unaware of the relationship between procreation and copulation.

We believe that this paper is an adequate answer to the redundancy argument used against the labor theory of value, but we do not think that the Neoricardian criticism of Marxist theory of labor value will soon be defeated. This is because rational arguments are combined with ideological interests.

This development of the labor theory of value may offer an explanation of empirical results showing the strong correspondence between labor values and current prices. It would be a fruitful line of investigation. However its acceptance does not depend only on the benefits it may bring but also on the defeat of opinions such as Scrope's, who find criminal intentions within the truth.

Appendix: Some Aspects of The Theory of Measurement

Kyburg (1984) distinguishes 3 approaches to The Theory of measurement: a)one oriented towards the practical needs of scientific disciplines b) a mathematical approach which seeks to systematize and generalize the measurement procedures common to different situations c) a philosophical approach which combines the two previously mentioned in order to consider the relationship between measurement and the construction of theories.

The main interest of the first approach is to find a procedure which will produce useful results for the members of a particular discipline. A good example of this kind of work may be found in Baird (1962). Its starting point is the presupposition that al measurement involves error. It therefore proposes techniques for the estimation and reduction of this error. This kind of approach is of considerable social importance and has had an interesting historical development. This can be appreciated from one of the slogans of the French Revolution which was: “one king, one law, one weight, one measure” and which resulted in the development of the metric system. The slogan originated in the need for the standardization of measurements in an era when there was an enormous range locally-observed measurements. Moreover feudal landowners fraudulently increased the measurements they used to collect tribute (Kula, 1980, Ch. 21-24). The development of many of the technical and scientific aspects of physical measurement is analyzed by Klein (1974) He mentions, for example, the importance of the measurement of temperature from the physical point of view. Before the precise measurements of the modern thermometer an instrument called a thermoscope could give qualitative readings.

The mathematical approach aims mainly at the construction of an axiomatic theory of measurement procedures. Luce and Narens (1994, pp. 219) suggest that Helmontz, Hölder and Von Neumann (von Neumann and Morgensten, 1953) “clearly had the idea of axiomatizing qualitative structures as possible models of empirical attributes and in the latter two cases of establishing, as mathematical theorems, the existence and uniqueness of numerical representations.”

[259]. See for this Freeman (1984, 221-264) who discussed the distinction between derivation and determination in a similar way.

[260]". ..Exchange is ruled by the law of value, a law that has two clauses: competition forces all producers to produce with the minimum input of concrete labor time, and forces a tendency toward a normal rate of profit in all industries." (Weeks, 1981, 40)

The first problem of measurement theory is that of representation. This consists of demonstrating that a series of properties of the arithmetic of numbers can be applied to a great variety of empirical situations. "This is done by showing that certain aspects of the arithmetic of numbers have the same structure as the empirical situation investigated." (Suppes and Zinnes, (1963, 4) The problem of representation is resolved by defining the properties of the operations and empirical relations used in the process and demonstrating that they are isomorphic or homomorphic with certain conveniently selected operations and numerical relations.

The second problem treated by mathematical theory is that of **uniqueness**. This consists of drawing up a rigorous definition of the scale of measurement. Thus, it demonstrates, for example, that the scale of measurement permits certain operations to be carried out using the measurements involved but excludes others. The procedure for measurement of weight uses a ratio scale in which the quotient of two different weights is meaningful. An interval scale is used to measure temperatures because the quotient of two temperatures is meaningless but the difference between them is meaningful. The ordinal scale does not admit the use of either the quotient or the difference and only the relationship ≥ is meaningful. This scale is used in neoclassical economics and in such measurements as that of air quality (Roberts, 1979. 64)

The empirical and mathematical approaches to measurement are linked. The mathematical approach accepts that the empirical structure being analyzed is, in a certain sense, "given". " "The practical approach makes use of and depends on the structures that happen to have been explored by mathematicians; the raw materials are forced to fit some relatively familiar structure. There are good reasons for this, but this reasons lie outside the experimental focus." (Kyburg, 1984, 5)

Finally, the philosophical approach tries to combine the other two. It seeks, for example, to overcome the problems which measurement error introduces into an axiomatic construction. For example, when the imperfection of all measurement procedures is taken into account, important properties of the relational numerical system such as transitivity become questionable. Although error theory is a reputable area of investigation, it has played a relatively small part in the philosophical literature of measurement.[261]

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[261] Kyburg points out that scientists of the importance of Newton, Maxwell and Gauss, interested themselves in the quantitative treatment of error. However, Campbell, in his analysis of measurement error, concludes that the theory of Gauss is "indefensible" (1957 p.161) because any reasonable error function should define a maximum limit for error in both directions, without stating how this should be done. Krantz et al (1971) state that "few error theories exist today" and undertake to deal with them in a subsequent book. (1984, 7n)

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MARX(ISTS) ON MONEY: WHY MONEY IS NOT COMMODITY BUT THE MOST AUTONOMOUS FORM OF EXISTENCE OF VALUE

Michael Williams

This is very much 'work in progress'. The following notes represent only the current, deadline-missing, state of that progress. For intending participants with access to the WWW, up-dated notes may be available closer to the conference date. One consequence is that detailed references are missing. In particular I would like to acknowledge discussions on OPE-L as a source of many ideas.

I. Abstract

There is little doubt that for Marx, in common with the Classical Economists, money was a commodity that emerged historically and logically from amongst other commodities to play the role of means of payment, means of circulation and store of value. It is almost as uncontroversial to argue that sophisticated monetary instruments in advanced capitalist societies seem to have all but sloughed off any connection with anything that could reasonably be grasped as a commodity. The attenuation of the link with bullion is a matter of historical record, and we may be moving into an era in which any necessary connection with state-backed notes and coins becomes decreasingly relevant. Money, it would appear, is becoming essentially electronic money. It is clear how this can act as an efficient means of circulation. It is less clear exactly how it can sustain confidence in itself as a means of final payment, especially internationally. And electronically stored information may seem to be a particularly insubstantial mode of storing value. Not only does it not enjoy the intrinsic value of bullion, but it seems decreasingly susceptible to state regulation.

Contemporary Marxist Economics, for the most part, cleaves to a commodity theory of money for *fin de millennium* capitalism. This is well-grounded in *Capital*, v.1, and has the advantage of maintaining a complete embodied abstract labour value economy 'underlying' the visible surface of capitalist economic relations. However, this orthodox Marxist approach has problems with the post-Sraffa critique of embodied labour values, and seems incompatible with the reality of modern monetary systems. Whilst bullion in the vaults of central bankers still plays some kind of stabilising and confidence-sustaining role in international payments, the monetary objects of the generality of advanced capitalist economic relations seem most un-commodity-like. They are not produced, *qua* money, by the expenditure of labour under capitalist relations of production with a view to them entering exchange. They have a social usefulness which is related neither to the labour embodied in them, nor to any wider costs of production. And their private usefulness is not to be consumed outside the sphere of circulation. Rather money can only continue to function as such by being condemned to circulate perpetually. Thus, we may say, money has neither a value nor a use-value, and so is not a commodity - the contradictory unity of value and use-value. The price of money is not related to some underlying value substructure, but is rather the reflex of the price of all commodities. Its determination is a complex function of the success of the economies to which it is linked, the role of speculation, and changing state policies. This alternative - non commodity - view is typically associated with the Marxist critique of economics, and so of the capitalist economy of which it is an

expression, rather than with Marxist Economics *per se*. But it is also associated with some eminent Marxist Economists, concerned to seek empirical tests of their theories in the observable monetary categories of contemporary capitalist economies - for example, Duncan Foley.

Working in the Marxist tradition does not entail seeking grounding for arguments only in Marx's own economic writings. Nevertheless, working in this tradition is usually motivated by an admiration for the insights of Marx's categorical system. Reconstructions and refinement of this, in the light of the history of Capitalism over the last 150 years, will be interested to examine the implications for the overall coherence of the Marxist system. The argument of this paper is, first, that we can reconstruct the relevant parts of Marx's economic arguments in terms of a non commodity theory of money, without losing any of its validity, and indeed thereby making it more applicable to late 20th Century capitalism. Second, that there is textual support for a non commodity, 'value-form' account of money in Marx's work. Third, that Marx's adherence to a commodity theory of money was an, albeit historically understandable, mistake; that mid-19th century capitalist money still had a strong link to bullion, but that commodity money can be shown nevertheless to be contingent with respect to the reproduction of advanced capitalist economies. In sum, commodity money is necessary neither to the logic of Marx's system, nor to the logic of advanced capitalism. These conclusions will be supported by the analysis of key exemplary passages from Capital.

II. Introduction

The typical modern economic account of money defines it first as a generally acceptable medium of exchange and means of debt settlement, useful in overcoming transactions costs of exchange, typified by the need for a double coincidence of wants. It is then also a store of wealth, transferring liquidity inter-temporally, and a unit of account. Cash is seen as a state liability, just as bank accounts are a liability of a bank. [262] *Soi-disant* 'commodity money' (that vested in objects with an intrinsic usefulness of their own) is perceived as characteristic of less sophisticated socio-economic systems. In the absence of a commodity base, confidence in money, required in order that it function as an acceptable medium of exchange and means of payment, resides in well-developed financial institutions (centred on a state-supported central bank acting as lender of last resort) and economic stability. A Marxist account does not necessarily dispute these various roles for money, but seeks to examine their interconnectedness within a specific, capitalist, social system. The functions of money are to be seen as *systemic* rather than merely pragmatic.

III. Marxism on Money

Foley's sophisticated modern Marxist encyclopaedia entry on money [Foley, 1983 #581], setting out its key characteristics under the headings of *Definition*, *Derivation* and *Functions*, may be taken as the framework for our discussion. We elaborate on these characteristics in turn, before problematising their interconnections.

A. *Definition*: Money is initially defined as:-

1. The general equivalent form of value.
2. Pure exchange value.

B. *Derivation*:

The category 'money' emerges from the logic of the system's reproduction, as well as historically from its development.

1. In its **Logical** derivation, Money is inherent/latent in the Commodity form of production organized by exchange. Sophisticated commodity production and exchange *requires*, or at least would be very inefficient without, a general equivalent. This notion is highly congruent with to the orthodox transactions costs ('double coincidence of wants') insight. Money emerges logically in *Capital* as the *general equivalent* from the consideration of commodity exchange (Part 1, v.1 of *Capital*). The meaning of 'general equivalent' here includes: i) that which *measures* the value of every other commodity - Money is a unit of account for expressing prices; ii) the notion that to function as the general equivalent, money requires *social recognition* as the *sole* general equivalent. Such social recognition is then to be grounded either in the universally recognised intrinsic worth of the money-object, or in the efficacy of the market system, or in the sovereign powers of the State, or in some combination of these.

2. In Foley's - as in most Marxist - account of the **Historical** emergence of money, there tends to be a subtle slippage in the focus of enquiry from Money to the historically important, but systemically contingent nature of the *money-object* as a moment of the grounding of Money. Particular money *objects* (paradigmatically, bullion) emerge historically by virtue of their convenient natural characteristics. Under capitalism a *commodity* emerges as the money-object, of which bullion is the most prominent because of its convenient natural characteristics (malleability, divisibility, durability, etc), as well as because of the intrinsic value socially attributed to it trans-historically (whether for rational and/or mystical reasons).

With respect to the monetary object, it would seem the dominant Marxist account needs to examine the insights casually adopted by orthodoxy - that *fin de millennium* money has all but sloughed off its connection with any commodity as money object. In place of the detailed historical account called for here I offer the following indicative historical 'stylised facts':-

a. The emergence of trade and production credit.

b. The issue of bank token money.

c. The evolution of bank credit and a fractionally-backed banking system.

d. The emergence of state monopoly of token money (as fiat money).

e. The development of Central Bank as State's banker and bankers' bank (for example the Bank of England was established as a privileged though private monopoly of joint-stock banking in 1694, joint-stock rivals were permitted from 1826, and the Bank's effective monopoly of note issue was finalised in 1844, with its role as 'lender of last resort', typically at penal rates, confirmed in 1847).

f. The debates from the late 18th Century onwards over the role of the Central Bank and of convertibility raised in embryo issues that exercise Finance Ministers and Central Bankers to this day: how to defend the value of the currency internally and externally with the minimum of inhibition of trade and

[262] Although what it is that the State owes the holder of its currency, post-convertibility, is not obvious. It is presumably some kind of duty to defend the internal and external value of that currency.

accumulation. For example, in England, the suspension of convertibility in 1797 sparked the famous debate between 'bullionists' advocating convertibility as an inhibitor of Bank profligacy, on the one hand, and their opponents who saw inflationary pressures as originating in non monetary forces, and Bank responsibility being ensured by a 'real bills' rule of commercial prudence. The latter was, for a Central Bank in the absence of adequate State regulation, proved fallacious by the inflationary events that led to the emergence of a *de facto* gold-standard by 1800. The case , on grounds of efficient financing of economic growth, for a managed currency, was famously made by the 'Birmingham School' in the early 19th century. In the banking debates from 1820ff, the initial success of the 'currency school' (the heirs to the 'bullionists', who advocated strict statutory restriction of Bank note issue by its bullion holdings) marked by the Bank Charter Act of 1844 was eventually eroded by the 'banking school's' advocation of demand-determination of note-issue in accordance with the needs of trade.

g. Technical developments, such as the development of an understanding of a general price level, and of index numbers to measure it [Hollander, 1979], and later the ever-increasing compass of definitions of 'money', made bullion and its price decreasingly relevant to macro-economic management.

h. The attenuation and eventual demise (1831) of the gold-standard internationally.

In general, the history of money and banking during the evolution of capitalism makes clear the ever-present and increasing role of social institutions in managing money objects, in pursuit of the reproduction of (the functions of) Money. More recently we can add:-

i. Increasing attempts to insulate the Central Bank from any policy except defence of the internal and external value of the currency (and concomitant regulation of the banking system).

j. The emergence of supranational monetary institutions performing some of the functions of embryonic regional and world quasi Central Banks.

At the microeconomic level, we need to note

k. the emergence of e-money, not only for inter-bank settlements, but also for retail bank transactions, Internet payments and, experimentally in a number of places, the electronic purse to replace petty cash transactions. E-money manifests most clearly Money as a unit of account and means of payment. And while the conditions under which it can be a successful store of value may need investigation, there is little doubt that it does so function.

These later developments, viewed as manifesting inter-temporal dialectical relations [Ollman, 1993] then invite us to revisit the past era of alleged commodity money. When we do so, of course, the social and sovereign determinants of the reproduction of even commodity money systems are thrown into sharp relief by such hindsight.

With respect to the money object, we need to distinguish **historical** from **systemic** necessity, as well as to examine their interconnection. Of course, throughout history money has been manifest in commodities and (as well as, in pre-capitalist societies, in useful objects in non-commodity forms). And it may have been a *historical* necessity at certain stages of socioeconomic development that money was indeed embodied in a commodity. This is what Marx thought. (Though even within *Capital*, it has been argued, notably by Steven Keen, Money develops from commodity money to non-commodity money.)

I want to argue strongly, however, that the logical diremption of Money from any particular commodity money object does not, of course, entail a divorce of Money from Commodity - the system of generalised commodity production and exchange. The accounts by the French Post-Aglietta Regulation school (for example, [De Vroey, 1981]) of the ultimate need for opened circuits of credit to be closed by successful integration of abstract labour in commodity production - if not in an orderly fashion then by more or less widespread crisis - remains in place. What is lost is only the notion of some more or less automatic regulation of the system by an underlying economy of embodied labour, in which the conditions of production of a money-commodity form the closing link. But, in my view, it beggars belief that Capital's drive to valorisation and accumulation should long be inhibited by the production conditions of the money commodity.

C. The key *functions* of Money are ranked by Foley into primary and secondary functions.

1. **Primary Functions**

a. **General Equivalent** (sole, socially recognised). This, presumably, we are to see as a *defining* function that emerges logically and historically as above. Money is, in its most fundamental and abstract determination, *the general equivalent expression of value*. In the actual abstraction in markets heterogenous labours and useful objects are systemically and systematically commensurated by being transformed into Money. This is indeed the process by which useful objects and useful labours are reproduced in their capitalist double form respectively as Use-value and Money and Concrete and Abstract labour. Human potential is thus reduced to labour power, in the double form of potential concrete labour and the wage, its Value form. This is Money's essential import as an element of bourgeois society and the capitalist economy.

The Value-form gloss on this emphasises that though Money, in this sense, emerges from generalised commodity production and exchange, this does not, in itself, entail that the money-object should itself be a commodity. It entails only that it should be an effective general equivalent.

From this crucial import flows the other familiar functions of money. Value is Commodity's social/economic, in contrast to its natural, quality. And Money is the sole socio-historically specific manifestation of Value. Money is the existence of Commodity as pure quantity, as distinct from its existence as Use-value. *The essence of Money is socio-economic, not natural*. (Whereas the essence of Commodity is that it is the unity of a specific social form of its natural usefulness - Use-value - and this socio-economic moment - Value). Money is the autonomous existence of the socio-economic moment of Commodity.

b. Money as general equivalent is grounded in Commodity first as the **Measure of Value** , expressing Value as price, and so manifesting the equivalence of socially necessary Abstract Labour in exchange. For Foley, following Marx, this

is expressed in terms of the money *commodity* in definite quantities, with currency names (£, $, etc) as a standard of price. However, this formulation, of course, implies, or at least is most congruent with, a 'gold' standard with full convertibility. But, as has been argued, Money as the standard and measure of Value is grounded necessarily, not in the production conditions of the money commodity, but in the systemic determinations of Commodity, within the framework of the monetary authorities backed by the State. As measure of value, Money certainly constitutes the social import of Value by providing its socially recognised measure, in conventional units. It is through Money that the quantitative dimension of abstract social labour as Value (the Money expression of abstract labour) is determined. But this moment of Money follows necessarily from it being the general equivalent concretisation of Value that itself commensurates heterogenous entities, regardless of its historically contingent concretisation in any specific money object.

2. **Secondary Functions** include medium of circulation, means of payment and store of value. *Pace* Foley, however, these are only 'secondary' in the sense of operating as *conditions of existence* of Money as the expression and measure of Value in the capitalist system.

a. As **Medium of circulation** of Commodity, C-M-C', requires a certain quantity of money per volume of C, per t, dependent on the total value of C, and the value of the money commodity (ie L/L/£=£, the price of commodities in circulation, *x*V, the velocity of circulation - T/£/t). Convertible tokens (notes and coin) may replace the money commodity for this function, Foley argues, just *because* it is secondary. First we should note that Credit (below) may also provide the liquidity that underpins this function. Indeed, the notion that circulation is a *secondary* function to manifesting abstract-labour values appears to rest upon a particular - 'productivist' - hangover from the era of embodied-labour accounts of value: the notion that value is created autonomously in *production*, and only 'realised' in *exchange*. But, I would argue, values only receive systematic quantitative determination in circulation - the systemic *intersection* of production and exchange. And Value is tendentially 'pure' quantity. The determination and redetermination of values is indeed the process by which the social system e*valu*ates products, and thereby the abstract labour by which they are produced. For modelling purposes, the money expression of labour (and so also its inverse, the abstract labour value of money) is only constituted by the systemic location of the labour process within the system of capitalist generalised commodity production and exchange that determines the processes of production and resource (social labour) allocation to different productive activities. As medium of circulation, Money permits this social validation of (the products of) decentralised labours. The quantity of Value is precisely the extent of social validation of private labours in the bourgeois epoch. Value-form accounts are led to this role of money immediately from the grasp of Value as the mode of association necessitated by the inherent dissociation of economic activity in the bourgeois epoch [Reuten &Williams, 1989]. It is a crucial characteristic of the capitalist economy that the allocation of social labour to the production and distribution of useful objects is driven by the imperative that such objects, successfully, take the form of Commodity: that is that they are sold in a generalised system of markets for a money price that covers their costs of production and an adequate rate of profit. Concomitantly, the labour process proves its social legitimacy to the extent that its product is successful as Commodity. The capitalist economic system, via market mechanisms, generates and enforces (more or less effectively) incentives and constraints that manifest more concretely this determining force of circulation on allocation and production.

A crucial link in the intersection of exchange and production that is circulation is what might be called *pre-commensuration*: the speculative calculations of capitalist decision-makers in terms of the expected values of their future costs and revenues, expressed in money. It is then market competition that (ultimately) weeds out the unsuccessful capitals, and rewards the successful. Once again we see that Money's crucial interconnectedness with Commodity is not through any systemic necessity that Money is manifest in a commodity, but through the systemic necessity that commodities are reproduced as Value by successfully entering market regulated circulation, the intersection of production and systematic exchange.

Credit emerges as the deferment of settlement of contracts by money transfer, either in trade or production. As *conditions of its existence* as medium of circulation, Money is then determined as **Unit of account**, as long as credit chains persist. Thus far, credit is merely a facilitator of circulation, closely tied to the performance of abstract labour and creation of commodities. The specialised capitals that provide this financial intermediation are, of course, a variety of financial institutions, including, but not confined to, banks.

b. Given the extension of Money as means of circulation by credit, Money must also function as **Means of Payment**, mediating debtors' and creditors' relationship - especially when lines of credit unravel in periods of realization difficulties. The specific role of banks then goes beyond financial intermediation to the speculative issue of credit, namely Credit Money. In as much as this operates as money, it transcends the private contract between bank and borrower, and takes on the characteristics of money - manifestation of the general equivalent, store of value and medium of circulation. The issuing of credit is a speculative move (as are all acts of investment, whether physical or financial), in that advancement of credit anticipates future production and realisation, and indeed, valorisation. As such it facilitates that valorisation, and then accumulation. When credit extension is not subsequently validated by the successful production of commodities, the conditions of existence of Money may be undermined.

It is vital to note here that this has nothing to do with the fact that credit money is not embodied in a commodity. It is rather predicated on the tendential undermining of the regulation of resource allocation by the value-form that is *expressed in* the erosion of credit money. Once again, the necessary

interconnections between abstract labour, Value and Money are not grounded in any necessary commodity basis for the monetary object.[263]

c. It is the **Store of Value** function of money that is most often cited as demanding 'gold'. Whilst it may be that contingently bullion can support the reproduction of Money as store of value, there is no systemic necessity about this. Conversely, to the extent that gold is in fact used as a store of value it is decreasingly acting as Money. It is primarily by reproducing itself as an on-going successful medium of circulation (above) that Money reinforces its role as store of value. This function is needed to facilitate circulation, in the face of trade and production credit. Individual bank credit would indeed be a too insecure store of value were it not grounded in inter-bank credit systems and a Central Bank as lender of last resort, reproduced as the bankers' bank and by its special legal status as issuer of state-money and regulator of banks. But the point is that it is precisely these *social* institutions, and not (except contingently) the existence of any intrinsically valuable money commodity (bullion) that are the conditions of existence of Money as a store of value. I am tempted to say that in as much as bullion is a store of value, it is not Money,

The social conditions referred to here are upheld by the State's responsibility for defending the external and internal value of the national currency, by its management of inflation and exchange rates. Of course, in this maintaining of confidence in money as a store of value bullion *may* play a role in sustaining confidence in a particular national currency. But this is a contingent, derivative (from the 'markets'' perceptions of the nations's economic performance), and declining role. It is because Money is crucially the sole existence of Value as form that it acts as a store of value, enabling, under certain conditions, the transfer of value as spending and investing power inter-temporally. It thus enables saving, investment and accumulation.

In this context, discussion about the pragmatic convenience of, say, e-money, as an effective store of value in different socioeconomic conjunctures is on a par with much older discussions about the pragmatic convenience of particular commodities as monetary objects in terms of malleability, divisibility, durability, intrinsic usefulness, scarcity, social acceptability (sovereign supported or not), mystic aura, or whatever. That is to say, such pragmatics are important in identifying what commodity may be grasped by the Money form, rather than in identifying the essential characteristics of Money as a social form.

d. **World money**

The final refuge of bullion-money is sometimes seen in its role of settling international debt. But, of course, this is now done overwhelmingly by payments in any acceptably 'strong' national currency (and, occasionally, in some crypto-world money such as 'Special Drawing Rights'). Of course, when confidence in a particular currency is undermined, deposits (including e-money) denominated in that currency lose, *paru passu* their ability to operate as a store of value. This may then develop into a self-fulfilling prophecy as there is a flight from that particular currency. It is clear that, in the event of a catastrophic loss of confidence in all national currencies (and no doubt any incipient international ones too), Value may take refuge in commodities whose most crucial characteristic is intrinsic scarcity (works of art, unique historical artifacts, rare stamps, etc), including bullion. Different commodities then act as more and less adequate stores of value. But this does not mean that the essence of Money is bullion, since the process we have been describing involves not the flight into a particular manifestation of Money, but the flight *from* Money. To that extent, the reproduction of the capitalist economy itself is tendentially undermined in such crises. Any flight into 'gold' is a flight *from* Money, as part of a flight *from* Capital.

3. **Money capital** arises from production credit (the extension of credit from the purchaser of commodities to their putative supplier/producer) and enables the accumulation of Money, by selling more than buying. It expresses Capital's command over labour power. For our purposes, we may just note that it is the successful deployment by Capital of Money, in what ever shape or form, for the purchase of labour-power and means of production and so the production and sale of commodities that validates and re-validates different money objects as manifestations of Money, the sole autonomous existence of Value.

IV. **The Value-form account of Money** has been deployed in this critical appropriation of the orthodox Marxist account of Money. Its systematic conceptual development claims to overcome the incipient arbitrariness of certain elements of both the standard Marxist and orthodox characterisations. It helps us to grasp the import of, and interconnections between 'defining', 'derived' and 'functional' characteristics of Money, and to legitimate the hierarchy of its functions. A systemic conceptualisation, such as the value-form approach, legitimates the hierarchical characterisation of the different moments of any element of the system by reference to its location within the system. In particular, it rests upon a distinction between those moments *necessary* to the reproduction of the system and their conditions of existence, and those, however significant in particular temporal or spacial conjunctures, that are contingent with respect to systemic reproduction. The value-form conceptualisation of Money may be summarised as follows:

Slide:[Reuten, 1989 #127: fig 2.1]

In general, the higher the level of abstraction at which the element is conceptualised, the more fundamental it is being asserted to be. The degree of 'fundamentalness' of a category is intended to capture the extent to which an element is necessary to the reproduction of the system, as opposed to being contingent. Within this approach, Marx's starting point in Commodity is trumped by what is claimed to be the more abstract, more fundamental starting point: the Value-form. Value is the specific social form of association that imposes itself upon economy and society in the bourgeois epoch, most crucially for our purposes, upon the socioeconomic processes of the allocation of resources to the production and distribution of useful objects. The most fundamental moment of capitalist Money, then, is as the sole near-autonomous (from any specific Use-value) existence of the Value-form. Of course there cannot be a form without content, but the import of this characterisation of Money is to emphasise the

263 Even early in the historical development of Money, in the 1790s, it was as *circulating medium* that gold coin was important. Wholesale means of payment consisted rather of bills of exchange and bank deposits (albeit then backed through effective convertibility to the Bank's bullion reserves) [Laidler, 1988].

contingency of the content of the money object to its social role as the manifestation of value. Money is intrinsically one-dimensional quantity, whose content is thus contingent.[264] This is the most abstract level at which our critique of any necessity for a commodity basis to money appears.

In sum, for the value-form approach Money *is* the general equivalent concretisation of Value, which must therefore *be determined as* the socially accepted systemic measure of value, the *conditions of existence of which* are that it be a store of value and a medium of circulation.

V. **Marx on Money** {*sadly in need of much more work ...*}

The Cantillon (1734)-Hume (1752) quantity theory of money was still the dominant orthodoxy in England during Marx's formative years, so this is what he saw as requiring explanation. Even the Classicals, dominated by Adam Smith, assumed primarily commercial competitive banking against a back drop of convertibility. There was little theoretical discussion of emergent Central Banking. Pragmatic institutional development seemed to run ahead of the development of the economic theory of money and banking [Laidler, 1988]. Of course, the proposition that Marx did not *need* a commodity theory of money must ultimately be tested against those passages in his work in which commodity-money seems to play a crucial and irreducible role.[265] However, in order to establish that there is an issue worthy of investigation, some indications that Marx's work did indeed appear to be congruent with a value-form account of Money are offered. [Marx, 1973 #157: (written 1857) 141] argues that as Value, a commodity is qualitatively equal to all other commodities, differing only quantitatively. The qualitative difference between commodities clearly resides in their different Use-values. A commodity is different from itself as product, or use-value. Commodity is a *mere symbol* of Value. This formulation must cast serious doubt on whether Marx would have accepted the modern Marxist order of derivation that insists that Money is primarily a commodity, and that non-commodity forms of Money are then mere symbols of that commodity. The point is that in its moment as Value, Commodity is *in itself* only a symbol of value! The Value moment of Commodity is general - as opposed to its particularity as a Use-value. Thus Commodity is the general equivalent only in as much as it is Value; in as much as it can slough off its intrinsically particular Use-value. That is to say Commodity is Money only as long as it ceases to be Commodity! Thus not only is Money not intrinsically Commodity, but it is intrinsically not a commodity... . That is to say, its historical emergence in the guise of a commodity - bullion - is systemically contingent. Commodity-money fails to capture the essential nature of Money as a fundamental element of the capitalist economic system.

Thus Money is not Commodity. Rather, '..., all properties which may be cited as the special qualities of money are properties of the commodity *as exchange value*, ...' [Marx, 1973 #157: 142, emphasis added]. As Value, a commodity *is* Money. But, of course, Commodity is necessarily the contradictory unity of Value *and Use-value*. Thus, whilst we can say Commodity is Money (in as much as it is Value); we *cannot* thereby assert that Money is Commodity. The argument that Money is not Commodity, although the money object may sometimes be a commodity (when commodity money is merely an historically contingent guise of money), is thus based at this very fundamental high level of abstraction. It thus does not depend on controversial arguments that Money is not Commodity because it is essentially credit-money, or because it is essentially state token money. Of course, such more concrete differentiations of the functions and phenomenal forms of Money may support the argument for the merely contingent, inessential nature of the bearer of money (in terms of systemic reproduction).

VI. **Money and Commodity compared**

The value-form arguments for the systemic contingency of the manifestation of Money as a commodity may be further particularised by reference to the imperatives of semantic coherence in Marx's conceptual system. What essentially has been argued so far is that Money and Value are but two aspects of the same category. There is in Marx no Value separate from Money. Money is, at the most abstract and fundamental level, the sole autonomous representation of abstract labour as Value. On the other hand, Money and Commodity, although interconnected as Value, are categorically different moments of the capitalist system. The first architectonic indication in Marx's own major writings for something like a Value-form account of money is that Commodity *and* Money are both introduced in Part I of volume I of *Capital*, entitled 'Commodities and Money'. What is more, Value is introduced here in connection with *exchange* and then *circulation* of commodities. The role of *production* and the integration of labour is introduced only much later. It thus seems clear to me that the prime characterisation of capitalism for Marx is the determination of production by exchange, and the concomitant emergence of Value only in circulation - the interconnection of production and exchange.

A. *Commodity*

Commodity is primarily a useful object grasped by the Value-form. That is, as a key moment of the system of capitalist generalised commodity production and exchange, Commodity is necessarily both:-

1. The contradictory unity of Value and Use-value. Its Value - expressing its systemic social evaluation - is systematically related to the quantity of abstract labour required to reproduce it. Its Use-value - expressing in an alienated form its usefulness - is implemented outside the sphere of circulation, in productive consumption in another labour process, or in final consumption in the private or state sphere.

2. Produced by the incorporation of labour with a view to selling it for a price that is intended to cover its costs and the going rate of profit.

B. *Money*, on the other hand, as putative Commodity fails on both these counts.

1. It has no value systematically related to the labour required to reproduce it, only an infinite number of exchange values, one against each commodity [De Vroey, 1981 #583: 187]. Rather it *is* the sole quasi-autonomous social existence of Value.

264 It is, of course, this that drives the conceptual development forward to the next stage: to grasp valorisation and capital accumulation. There is, after all, nothing to be done with 'pure quantity' except to increase it!

265 Such as: Capital, v1, ch III, p. 225 of Penguin edn; Value, Price and Profit, International Publishers, p. 52.

It has no Use-value, rather its systemic social usefulness is to be this existence of Value, bearing the social functions of Money.[266]

2. Money *qua* Money cannot be reproduced by the incorporation of labour in a capitalist labour process. It is not produced at all under capitalist relations of production with a view to selling for a price that covers its costs and the going rate of profit. It is reproduced only by social validation. It maintains this social usefulness, not by leaving the sphere of circulation, but, on the contrary, by being condemned to, actually or potentially, circulate endlessly within it.

Thus the only aspect in which Money is commodity-like is that its price is determined in various markets as the reflex of the price of all actual commodities.

VII. **The State and Money**

If the social validity of the various money 'objects' is not automatically reproduced by commodity-backing, then the social institutions that manage their social validity clearly need investigation. And for this, a key organising category is the State. At first glance it may seem that the State steps in to reproduce Money only once its automatic reproduction as a commodity by market forces fades. However, in managing Money the state is managing the social relations that Money mediates. Historically, the sovereign has long been involved in determining the price of the bullion in the national currency, the extent of cutting of gold when coined and the enforcement of legal tender. Since the abolition of the gold standard and convertibility, the role of the State in the reproduction of Money has burgeoned, and that of bullion has been marginalised. Bullion has a role only to the extent that a state or some quasi-world-state international monetary institution choses to use it. The question arises as to whether the role of the State is (*pace* [Foley, 1983 #581]) any different in regulating Money as the standard of price than in regulating other conventional standards of length, weight and so on? On the one hand such a viewpoint helpfully emphasises that Money is a *dimension* rather than a *substance* (or even a *field*). But on the other hand, the regulation of weights and measures generally is a trans-historical rather than a specifically capitalist function for the State.

[Marx, 1973 #157: 150] locates the necessity of the State to the reproduction of Money in the contradictions of (commodity) money itself. He perceives one manifestation of this contradiction in the purely conventional nature of Money as standard of Value: 'Since the standard of money is on the one hand purely conventional, and must on the other hand find general acceptance, it is in the end regulated by law.'[Marx, 1976 #586: 102, cf 125] Though Marx talks of State paper as a mere token of bullion, it is clear that his 'law peculiar to the circulation of paper money' relates the quantity of money to the value (number x price) of commodity transactions. This is quite independent of any bullion standard [Marx, 1976 #586: 128-30] - except one based on existent expectations that paper money *should* be bullion-backed, that could act as a discipline on States tempted to undermine the value of their currency. [Marx, 1976 #586: 129-30] concedes that national paper money 'must have an [local] objective social validity of its own' enforced by the nation state. With the benefit of hindsight, it seems legitimate to recast what was troubling Marx here in the following way:- Bullion is in fact an historically specific token of money - albeit a rather effective one. That which tokens of money are tokens off is the social institution of money, not any specific money-object (commodity) such as bullion. Fiat money is then no less of a symbol or token than is convertible notes and coin. It is a state supported manifestation of the institution of money. In neither case - bullion or fiat money - is it the relative conditions of production of gold and other commodities that provides the datum or standard of value. Rather it is the relative conditions of value creation in different national economies that reproduces national currencies (expressed in notes and coins or financial instruments denominated in it) as standard of value.

VIII. **The Next Step**

A. Further research is required to examine Marx' account of money, primarily in *Capital*, in order to see how congruent the non-commodity, value-form account is with Marx's Marxism.

B. A further project would be to investigate the affects of the value-form conceptualisation of money on various contemporary Marxist theories of the capitalist economy, and critique of economic orthodoxy.

C. Empirical investigation is also needed of the development of e-monies, in particular with reference to how well they operate as a store of value (short-term? Long-term?) And under what conditions this role is undermined.

D. The role of residual Bank hoards of bullion would also bear empirical investigation.

E. The concretisation of Money calls ultimately for the filling out of the character mask 'Financial/Money/Banking Capital'.

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[266] Cf [Hayek, 1960 #153: 324-6, 520-1] 'changes in the relative supply of money are ... much more disturbing than changes in any of the other circumstances that effect prices and production' because 'money, unlike ordinary commodities, serves not by being used up but by being handed on'. In this respect, we might say, money is at best a peculiar commodity. The consequence, for Hayek, is that monetary disturbances do not, unlike those in other markets, necessarily stimulate automatic equilibrating forces. Money cannot be reproduced by market forces alone.