VALUE, PRICES AND COMPETITION.

PAPER TO BE PRESENTED AT THE

1998 MEETING, INTERNATIONAL GROUP ON

VALUE THEORY

FEBRUARY 27th TO MARCH 1st, 1998.

EASTERN ECONOMIC ASSOCIATION.

NEW YORK CITY.

by

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First Preliminary version

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The problem.

Marx approach to the theory of prices is unique, it claims that the construction of a framework to understand prices within a capitalist economy demands to set three mutually related notions of valuation:

value, prices of production, and market prices.

Other approaches to pricing differ dramatically. For Neoclassical orthodox economics, it suffices to work with market prices, and the notion of production prices and value are redundant and unnecessary. For Neo Ricardians, it is only necessary the notion of prices of production to have an understanding of prices, and the notion of value and market prices are redundant. Current neo Ricardian theoretical analysis goes on without paying attention to this fact and often dismiss other theoretical views on a critical attitude that pretends to discuss Marx model within their own analytical framework. The attempts to reduce one theory to another is very common. For example, Samuelson (1971) pretends to dismiss Marx theory of value reducing it to a Smithian model of exchanges, where there are not capitalist relations of production. Ian Steedman (1978, 1984) pretends to dismiss Marx theory of value on the basis of a model where labour is homogeneous in advance, and there is no consideration of any relationship with market prices. In both cases, exchange takes place in barter economies. Our basic contention is that such criticisms are misleading in so far they are no considering properly the actual theoretical context under review. Such mistakes are not prevalent only on the Neoclassical and Neo Ricardian file and rank supporters, we can also find them in the Marxian literature. For example, models that pretend to support the labour theory of value, based only on a peculiar production process, not clearly associated to a capitalist process of competition.

Our contention in this paper, is that the understanding of Marx theory of value, prices and capital, has to be understood as a whole, and not in parts. This introduces a great deal of difficulty to present the theory in a clear setting, such that it is possible to develop its analytical potential. Part of the problem with the subsequent debate, is that Marx's presentation, at some stage, impinges on the fundamentals of the relationships such that at times postulates a very definite relationship of "determination" ($\rightarrow$), that is, as if it were a causal relationship, such that it is usually read:

value $\rightarrow$ prices of production $\rightarrow$ market prices.

Given this logical construction, if the first link (the transformation of values into prices of production) is not consistent, consequently the second one is pointless to be considered. Therefore it is not strange that the analysis of competition has not received more attention. If the first link is dismissed as a weak theory, there is no need to bother on the second.

Unfortunately for some Marxist scholars this has also been an attitude. Nevertheless, it is remarkable that for Marx , in spite of many assertions in Capital that would assert that reading, it is also possible to observe in the first and third volumes of Capital (1975) and in the chapter on capital of Grundrisse (1973), that his basic methodological approach would consider that the relationship is not univocal nor rigidly determinate. In fact the view is that the Marxian theoretical building is far more coherent if it is not presented as a univocally deterministic relationship, instead of a more dialectical, logically consistent, set of relationships is postulated. The contention of this paper is that this approach could be far more promising in order to recover a sound, modern and by far stronger view on the formation of prices and values from Marx perspective. The argument will be presented with the aid of Graph theory.[1] This methodological instrument might help to clear some of the issues, that standard algebra might obscure.

Let us advance an example. A theoretical proposition might be constructed following the rule: (a) $\rightarrow$ $\varphi \rightarrow$ (b) , that is to say: a turns into b through the transformation (φ) . The proposition rests on the presumption that a, b and φ are well defined, that is to say, they are no fussy. But it also rests on the notion that every element necessary to form (b) are already contained in (a) and the operator (φ) unambiguously transforms (a) into (b). Graph theory also show us that the proposition can be valid only within a particular theoretical context where the relationship : (a) $\rightarrow$ $\varphi \rightarrow$ (b) can be formed properly. The standard algebra of that expression could be something like: (b) = φ (a).

With this instrument, let us reconsider the ‘transformation’ debate. Indeed this has been an endless debate, among other things, because the limits of the proposition have not been clarified. Right at the beginning the question is if (a), the notion of value, has already been defined such that it contains everything necessary to turn into a particular notion of price, that of a direct price or value. A problem in case is the standard assumption that value turns out of abstract labour. But, how is it the case for abstract labour to be in existence at all?. Initially, value has been conceived as the relevant notion that can explain the ‘sociality through labour’, that is, the way in which the particular model of society rests upon the production of the means of subsistence created by labour. The object of analysis is the reproduction of society by the full development of labour producing commodities. But abstract labour, is a notion not necessarily contained into (a) i.e. within the notion of value. In fact is a presumption, not a ‘given’, for the construction of the notion of value, and abstract labour cannot be but the result of the full valorisation of commodities in the market.

Next is the question of (φ), the so called ‘transformation’. Now it is introduced the notion of ‘sociality through competition’ , that is the set of relationships that originate in the multiplicity of capitals, particularly the strive for the rate of profit, that creates a tendency for the equalisation of the rates of profit. This is not a notion that turns ‘individual things’ into ‘social prices of production’. Neither it is a turn from abstract labour into money prices, because value is conceived as a monetary magnitude right from the beginning. Therefore, what is the realm of the ‘transformation in itself?. It takes for granted the result of competition, but is presented as if the transformation is already contained into (b). Therefore, how is constructed the notion of the price of production?. Would it be the case that (φ) is redundant?.

These difficulties are continuously met in current and past Marxian literature on the theory of prices. The standard ‘transformation’ procedure, in a way has a common result, such that the model somehow comes to an end unsuccessfully , in so far they can not prove the equality of the rates of value to the rates of prices, because:

- The result is restricted to one particular condition: the equality of the organic composition of value . or
- The conditions to standardise the sum of values to the sum of prices would contradict the standardisation through the sum of the surplus value to the sum of profits.
- The conditions for the transformation of raw, individual labour into social, abstract labour are obscure and can not be resolved with the model : (a) $\rightarrow$ φ $\rightarrow$ (b).

The limitations of those results have not been resolved through the manipulation of the mathematical algorithm, for example, introducing a time parsing as a recursive process as in Carchedi (19). The reason is the difficulty with the form of construction of the proposition: The relationship between

[1] Salazar (1985)

values and prices of production, constructed assuming that the result of competition, i.e.: the equalisation of the rates of profit, is assumed in advance, therefore not necessarily demonstrated. It is evident that this condition is not necessarily fully contained within the node (a) and (b). Therefore, the presumption of the convergence of the rates of profit, through competition, excludes the case where it might not produce the result of the equality of the rates of value to the rates of prices. Consequently some elements have to be introduced, not as ‘givens’, but as elements ‘posited’, that is assumed, though constructed at some other stage into the theory. Those elements are not exogenous, but should be posited, that is constructed within the whole theoretical structure at some stage.

The Theory: Context and Relationships .

In Graph Theory, a theoretical construction is understood as a net of relationships of a set of homogeneous beings or “states” of a process. Theoretical constructions are valid only within a particular theoretical context. This characteristic is shared by any theory.

What is the proper context to postulate the relationship of value and prices of production?. Most Marxist suggest that both are consistent in the sphere of Capital. Nevertheless in the discussion of this relationship, it is often neglected the influence of competition. This is so, because the essentials of the analysis of value and prices rests on two principles, that Marx consider them, each one on its own, though not independently:

a) The sociality of labour, that is, the construction of society through the capital-labour relationship. This can be understood as the social base of the whole analytical building upon which the notion of a capitalist economy is built. This encompass the notion that a market economy rests on class relationships and that an equilibrium price rests on exploitation.

   Nevertheless the whole analysis on this issue is developed on the following two assumptions:

   - Labour values are already known. Labour is homogeneous and abstract as a presumption. Abstract labour is posited, and its magnitude has already been determined.
   - The whole analysis is developed in an equilibrium framework. It amounts to assume an efficient competitive market process, or alternatively, rests on the

presumption that it is necessarily stable. In Marx vocabulary, the continuity of reproduction is presumed.

b) The sociality through the "laws of capital", that is the relationships that develop out of the "the multiplicity of capitals". This is not constrained to the process of distribution of surplus value. In fact is essential for the construction - formation - of values and prices. Competition in Marx framework is "the relationship of capital with itself", that can be understood in two forms: the formation of a common rate of profit and the relationship of productive with non productive capitals, particularly financial capitals. This part of the analysis rests on the presumption that value magnitudes are already defined.

The main difficulties in the debate on "transformation", come out of the pretension to obtain a result on the determination of labour values, out of these very particular theoretical contexts. The limitations might be attributable to the efforts to obtain values from the first principle, the sociality of labour, and prices of production out of the second, the sociality through competition. Therefore, we have two distinct levels of analysis, that can not be separated:

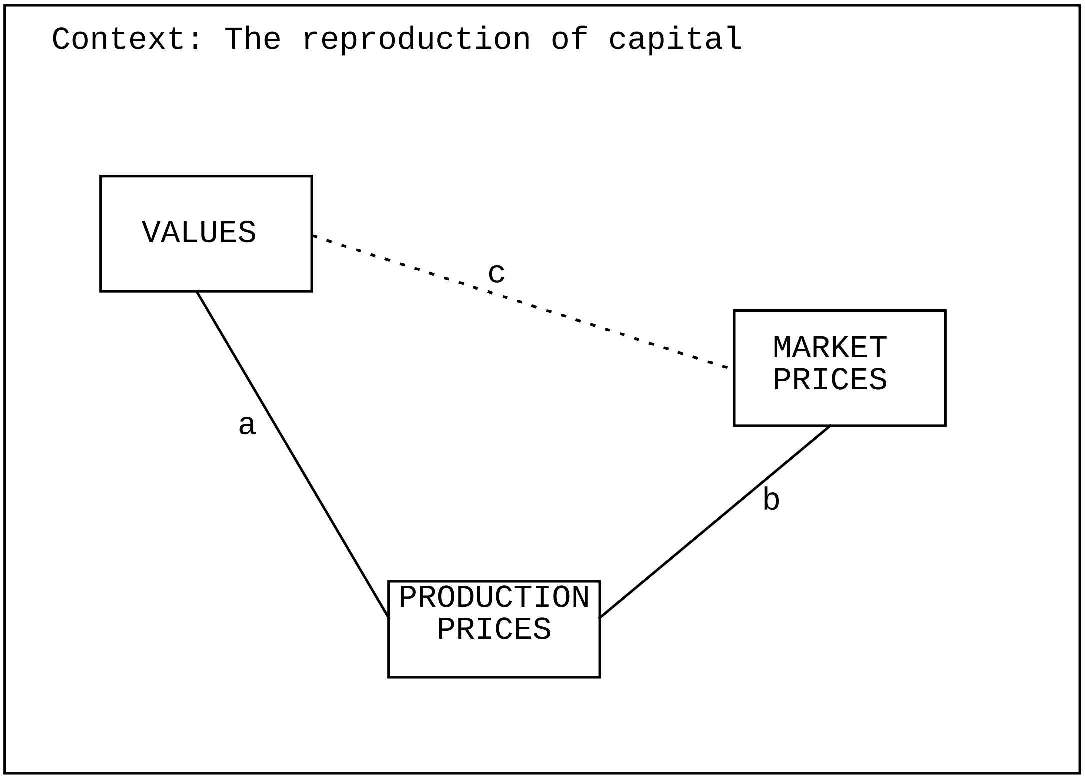
a) Capital in general, and

b) Capital in competition.

Our contention is that the analysis of capital and prices is always concerned with the two levels of analysis and with the three notions of valuation. Therefore, a "linear" way of determination : values $\rightarrow$ prices of production $\rightarrow$market prices ; looks somehow unsuitable to contain the analytical framework where the dynamic interplay {the dialectic character of the relationships} is lost. It is remarkable that this reading can be found in Marx. This argument is backed by the discovery that for Marx himself, the development of his research was different to the form of exposition chosen for Volume I and III. The point under discussion is not on the validity of one line of reading, for example the assertion so often found in Capital, reasserting the way of determination from the ’fundamentals’ to the ‘appearances’ , but that even such “reading” requires the other possible “readings”, those that recover the form of construction of categories and their complex relationships.

The content of an alternative approach could be presented in terms of the following Graph[2], where the deterministic view can be displaced, and a dynamic, basically dialectic set of relationships can be put forward:

GRAPH: VALUE AND PRICES. THE PRIMAL STRUCTURE0



Where:

a is for transformation of values into prices of production

b is for competition, and

c is for the (fundamentals/appearances) relationship.

The model presents the same components, but the relationships are now in terms of Graph theory, in such a way that the possibility of dynamic relationships can take place without breaking with

[2] Graph theory has been widely used in other sciences. For a clear and useful presentation, see Salazar (1985).

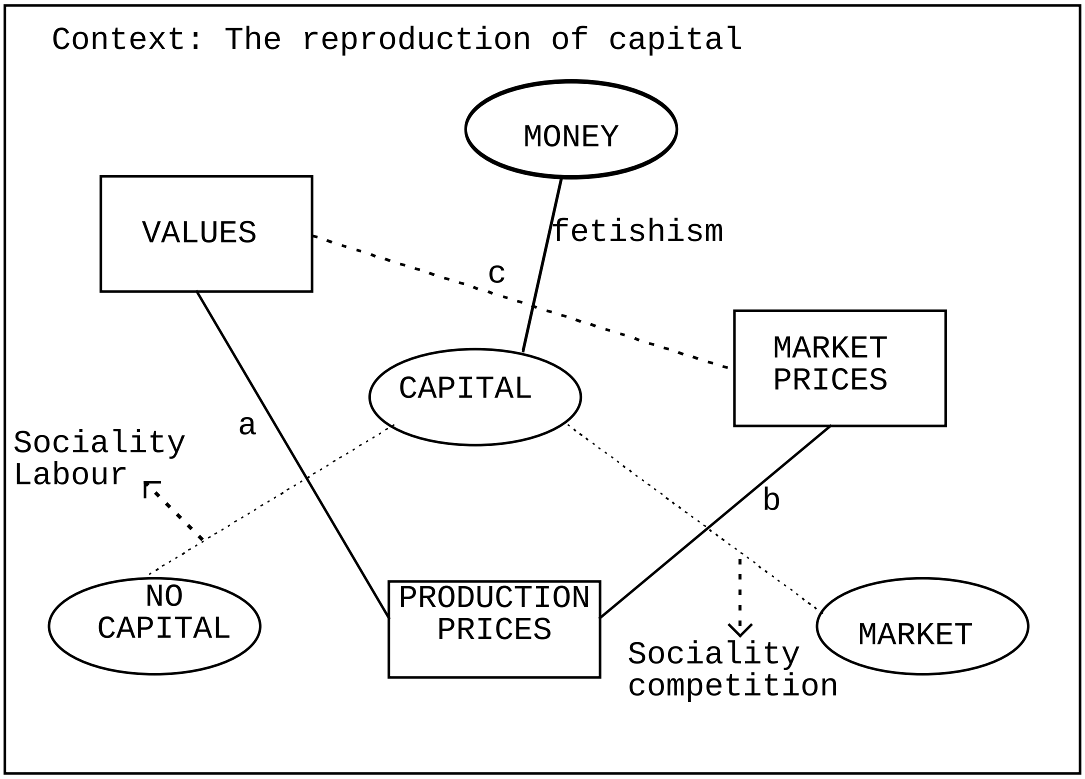
the logical formality of Marx analytical framework.[3] The model means that it is not possible to advance a notion, i.e. value, out of its relationship with the other notions, price of production and market price. A Graph can be oriented, that is contain particular forms of incidence. Nevertheless it can also be expressed open to include different forms of incidence. This makes possible the standard form of determination but it also allows the analysis of the way in which market and production prices have an incidence in the construction of the notion of value. If the whole analytical structure is constituted by the three notions of valuation, therefore it is not possible to formulate any statement about the relationship of, let say, values and prices of production, without considering explicitly the particular relationship that concerns market prices. The relationship with market prices now is evident that can not be referred solely by the “results” of the process of competition, that is the equalisation of the rates of profit, but it also concerns the relationship of values with market prices, that for the time being here is understood as the relationship of 'essentials/appearances'.

The structure expressed in squares, value, production prices and market prices, constitute the primal structure. But the set of relationships altogether provides something different which is not already contained in every node or line: an area of synthesis. The set of relationships of the areas of synthesis in fact produces a complementary set of relationships, which are essential for the model, in particular they express the forms of motion of the primal. Therefore they are a *dual* to the primal structure. A theory has to consider both parts, the primal and the dual. The core of the dual is the notion of capital, which can have different relationships according to its complementary parts: the 'no capital', that is labour, money and the market.

GRAPH: CAPITAL, VALUE AND PRICING.

PRIMAL AND ITS DUAL

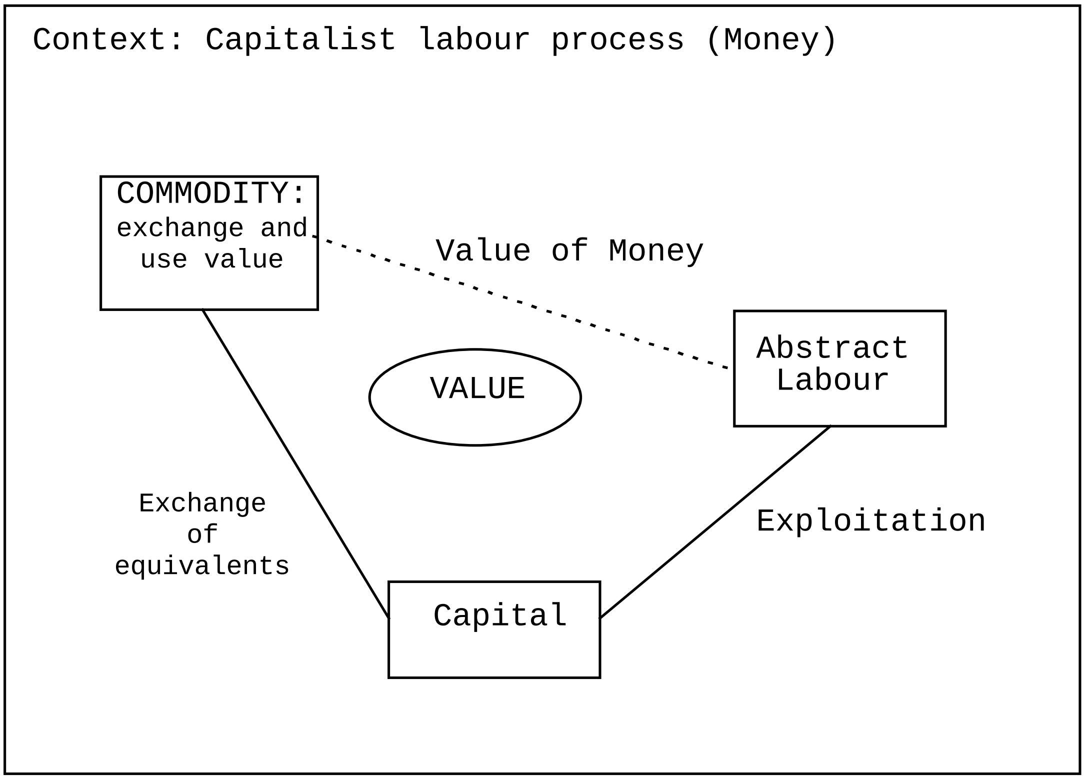
[3] Graph theory is extremely formal from the point of view of a logical construction, such that it is constructed following a well defined syntax: The core of the theory is represented through lines that resemble the essential relationships, while doted lines are relationships derived from the essential relationships. The nodes can represent “states” of a process or theoretical categories.



The dual can be read as follows: the nodes capital, labour and money have an area of synthesis: value. While capital, market and money have an area of synthesis: market prices; and so on.

It is also evident that we could also express the construction of basic notions in the same way, for example, within a particular theoretical framework, the notion of value can be constructed out of the set of relationships of abstract labour, commodity and capital, as 'states' of the same 'substance' in transformation. The relationships are: the labour-commodity relation is conceived initially as an exchange of equivalents, the labour- capital relationship as the rate of exploitation and the commodity-capital is a relationship that gives rise to monetary relationships. The notion of value is introduced as a dual, that is, as a result of the set of relationships of the whole structure. The form of representation makes evident that it is a notion about the exchange of equivalents within a framework where labour is already abstract and where exchange occurs as a monetary procedure.

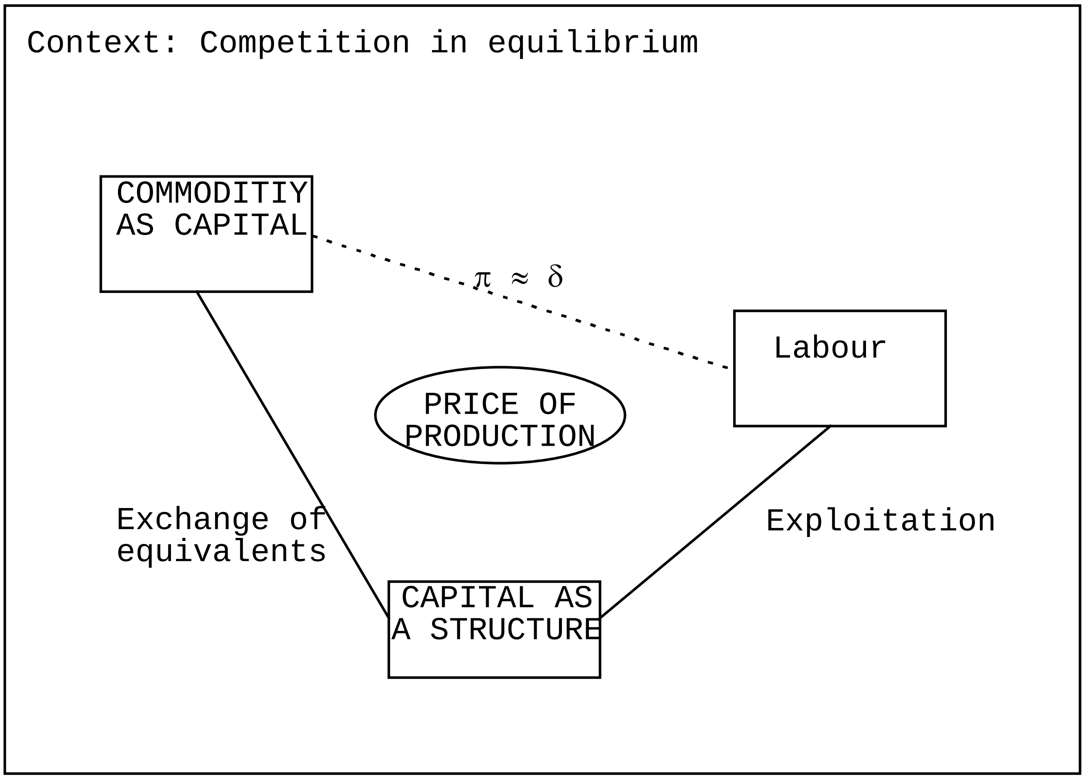
GRAPH: VALUE.



Where : The relationship of capital and commodity , as an exchange value is an exchange of equivalents. The exchange is a monetary relationship, such that it gives rise to value and a surplus which for capital amounts to the rate of surplus value. Value, labour and surplus value are in the dual.

The notion of prices of production can also be analysed in this way. The analytical context now is the sociality through competition, but in equilibrium. Competition now is 'the relationship of capital with itself', which for prices of production means the tendency for the equalisation of profit rates. The relationships are conceived within the context of a monetary economy, and under the presumption that the magnitudes of value produced had already been set. Commodities now are a form of capital and exchange is regulated as capital, under a common rate of profit, though with a magnitude of profits which, as the sum of value was set in advance in the context.

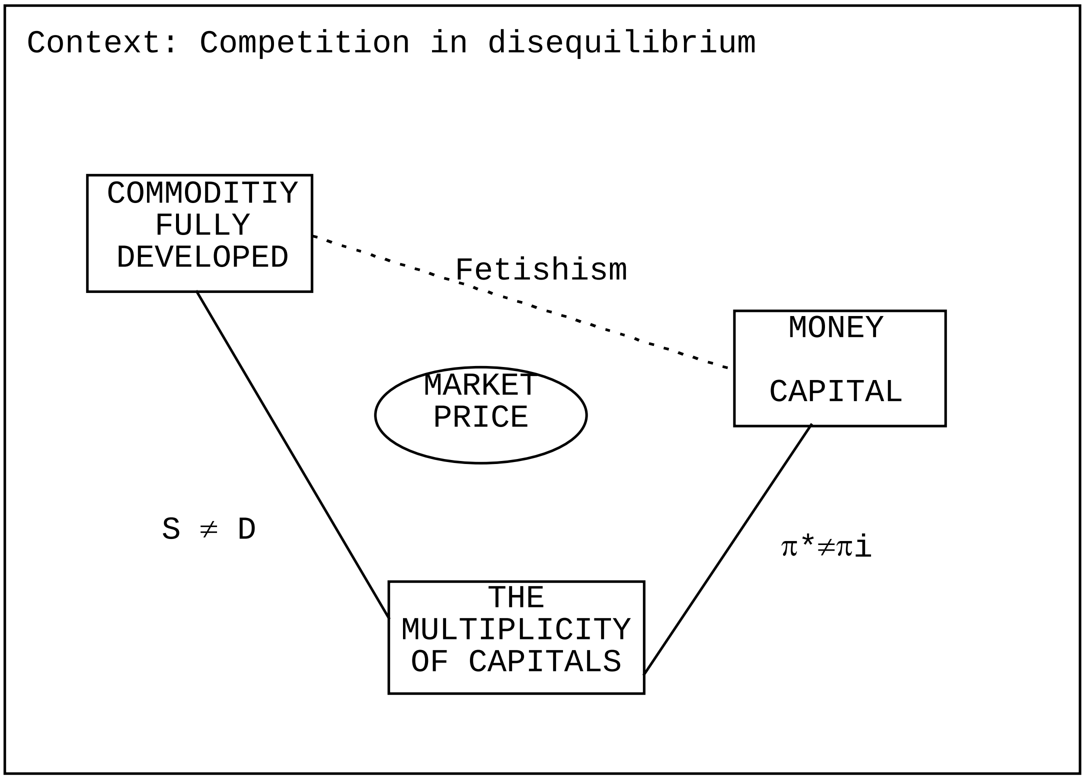
GRAPH: PRICES OF PRODUCTION.



Capital is not 'general' anymore but represents the structure of relationships of the different capitals, which in respect to commodities is expressed in an exchange of equivalents. Here competition expresses in equilibrium, such that the rate of profit (π) is the same as the rate of surplus value (s). The dual express the prices of production, either in the form of a standard rate of profit, a vector of equilibrium prices and an homothetic vector of production.

But the analysis of market prices seems to be an empty space, at least within the Marxian tradition. Our interpretation is that there should be an structure that could be isomorphic to the other two, where we have now a full development of the form of commodity, in relationship with the multiplicity of capitals, that is in competition, but in disequilibrium. Therefore, although the mass of profits continues to be the same, the rates of profits for industries and enterprises may not necessarily be equal. It is competition under disequilibrium.

GRAPH: MARKET PRICES.



This last, and very important component of the theory, expresses the relationship of competition, as the multiplicity of capitals, but in disequilibrium. Supply is not any more necessarily equal to demand, and the rates of profit (πi) are not necessarily equal to the standard rate of profit (π^*).

This representation, gives support to a critical view to the modern theory of pricing, where from the Marxian approach we have that it is not possible to construct the notions of equilibrium and disequilibrium within the same 'analytical box'. It advances the idea that Marx theory of prices was concerned not just with the problem of identification of equilibrium or reproduction magnitudes, but also with the problem of its dynamic construction through the market. The Marxian approach would amount to say that the dynamics of competition is introduced through the equilibrium-disequilibrium relationship of values, prices of production and market prices. The contention from this view, would be that it is not possible to pretend to consider both problems, that is equilibrium and disequilibrium "within the same box", and that the analytical strategy from a Marxian view was to have them differentiated and related partly by the notion of competition, but also through fetishism.

The omission of one 'node' has consequences:

Following the form of construction within Graph theory, it is also possible to analyse the implications for a theoretical construction where some 'node', a notion or a relationship is missing. This is a device that could be helpful in a critical appraisal of other theoretical views. For example, the Neo Ricardian approach pretends to formulate the theory of prices without any other element but the theory of production prices. For them the relationship with values is not necessary, production prices can be estimated without resource to values, nevertheless, it seems that nothing can say neither about market prices nor money prices. Therefore a contradiction appears in terms of their own argument. They identify the centre of gravity of variables, whose movement, market prices, can not be related to that centre of gravity. That is, there equilibrium solution, is the result of a model whose dynamic characteristics can not be established explicitly. In short, the Neo Ricardian solution seems to be suitable to express an equilibrium, of a presumable dynamic system that can not be identified. Therefore it could also represent the equilibrium of a different society, for example of a planned economy, where agents presumably are never out of equilibrium.

On a different account we can also identify the nature of Neoclassical orthodox economics. General Equilibrium prices are, for market prices, a peculiar solution of a system where the equilibrium exist independently of the disequilibrium trajectories that market prices should follow according to its situation of excess demand. It is as if equilibrium magnitudes can be set independently of whatever the condition of disequilibrium may be. Therefore its analysis of "existence conditions" is at odds with the analysis of "stability", even if considered in its own terms. (Hahn, F. (1982); Franklin M. Fisher. (1983)). The impossibility to determine a positive value for money within this theoretical framework, is just but another example of the difficulties that arise due the attempt to introduce an equilibrium notion that exist even independently of the actual market process. (Patinkin (1965); Benetti (1991); Solow & Hahn (1997)). In other words, if the model behaves according to the law of Walras, money disappears.

But the omission of one part of the structure can also be found in the Marxian tradition. Generally, the literature on value-prices of production is built ignoring the relationship on competition. 100 years of theoretical debate on the "transformation problem" might be representative of it. But it also shows that has been unsuccessful in so far it has ignored the problem of competition.

Nevertheless the recent revival on the problem of competition might well also be blamed to have been built ignoring the relationship of values-prices of production.

Both of this problems had lead to:

i) The impossibility to work out a consistent solution of the value-price relationship, that do not come to:

- Stringent limitations in the analysis, e.g. Sum of values = sum of prices but not Sum of profits = Sum of surplus values and that the organic composition of capital has to be the same all across the economy. (Morishima (1974) , Bortkiewicz (1966)) (productivistic approach) or that every sector is growing along a Marx-Von Newman trajectory of homothetic production, (Abraham-Frois-Berrebi (1979).
- The Problem of the introduction of a ‘numeraire’ and not money. Barter relationships and not market relationships.
- The value-price relationship at a quantitative level is not necessarily fulfilled.
- Iterative solutions depend on the "structure", not on the adjustment path: Morishima (1974), and Morishima and Catephores (1978), Charchedi ().
- "Nomenclature" Hypothesis: Identification of production goods, that is inputs, with capital. Identification of values and prices, Benetti & Cartelier (1981).

ii) The ambiguities of constructing a dynamic process about the formation of market magnitudes independently of value magnitudes. For this problem to have a sound solution, it is necessary that market magnitudes can operate in disequilibrium, while capital relationships are consistently expressed to form prices of production and value magnitudes. The failure to observe this condition is expressed in:

- Equilibrium magnitudes pre-exist and are obtained in a pseudo General Equilibrium market process (excess demands are = 0). (Niakido (1985). See Kubin (1989))
- Prices of production are obtained out of a matrix in physical units, not value magnitudes. {Are prices of production = values? or simply do not mater for the approach}. {Flaschel-Semmler (1986, 1987), Dumenil-Levy (1987), Benetti (1986)}

- The process of formation of values and prices is not explicitly exposed, therefore the heuristic value of theory is obscure.

Our contention is that the difficulties with both set of situations derives from the same condition: The pretension to build the relationships, 'transformation' and 'competition' one independently one of the other.

In the three cases, we have then, that the identification of a logically, mathematically consistent solution, placed out of a relationship with either values or market prices, has been achieved at the cost of missing two essential questions of the theory:

a The explanation of the reproducibility of a capitalist economy, ruled by decisions taken by individuals, and

b The explanation of exchange in a monetary, decentralised economy, where exchange takes place in a money-commodity relationship.

The contention of this paper, is that Marx's analysis is concerned with these questions, and not with the solution of a particular set of equilibrium equations. In modern language, the problem is to express a model of a decentralised, monetary economy, ruled by the impulse to maximise the rate of profit. The theoretical 'object' of analysis therefore is not coincident with the ‘object' we find in the Neo Ricardian and Neoclassical models. Furthermore, It seems that the theoretical device introduced by Marx is conceived to answer two questions:

i) The analysis of reproduction, that is under conditions of equilibrium, which has been widely considered in the literature, and

ii) The analysis of the equilibrium-disequilibrium relationships, that generally has been ignored.

If we go back to our scheme, we might guess that the difficulty concerns the relationship of determination of:

- magnitudes: values and capital. That in Neo Ricardian and Neoclassical framework might appear as aggregation problems.
- The equilibrium-disequilibrium relationship, (stability) and
- The nature of capital as:

- a class relationship,
- the social magnitudes of values produced, that is
    - labour - value
    - money - value.
- a self reproducing system: relationship of equilibrium and crisis.

There is one approach that somehow considered the whole setting altogether, and is the one that depart from commodity fetishism.{ Rubin, Rosdolsky, Colleti, Napoleoni and Castaingts (1984), Benetti (), Robles ()}. In this case value is a money relationship that initially is to be identified out of market relationships. Nevertheless commodity relationships express social relationships. In this approach the value of money is essential and opens the discussion about the form in which labour is turned into abstract labour.

Conclusion

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Appendix on the Literature: ???.. Approaches to competition.

Three basic approaches to competition in a classical-Marxian framework have been developed:

1.- The Cross-Dual approach.

Dumenil-Levy (1987) and Flaschel-Semmler (1986).

This approach rests on two distinctive features: Disequilibrium is expressed in differential rates of profit, such that advances of capital respond to differential profitability. This feeds a dual system in prices: $\mathbf{p_i} =$ ¦ $(\mathbf{Q_i})$ and quantities: $\mathbf{Q_i = f\,(p_i)}$. The emphasis on the disequilibrium variable p leads to the analysis of effective demand and a process of adjustment that rests on price and quantities adjustment. The models provide for local stability, such that $\mathbf{p_t \to p^*}$ and $\mathbf{p_{it} \to p^*}$, and only introducing assumptions about the sign of disequilibrium allow for equilibrium. These models provide a strong framework for the analysis of stability conditions in models of prices of production. Nevertheless, there is not a clear statement about its relationship with the formation of values. This means either that the sum of values is assumed constant or simply does not matter for their formulation.

2.- Models on the structure of production.

Nikaido (1984), Benetti (1986).

The variable in disequilibrium is the rate of profit p, that puts in motion investment decisions accordingly. The effects of investment decisions is analysed in terms of its impact on the effectual demand (the amount of demand that is regulated by the advance of capital for the acquisition of inputs and capital goods for production). This allows to analyse the impact of demand on the trajectories of adjustment of quantities and prices. These models are critical to the 'classical conjecture' of market price variables gravitation around production prices magnitudes. Under these models, stability, meant to be convergence of market variables to natural variables, is restricted to models with input-output matrices characterised by a determinant $| A | < 0$. It is to be observed that the matrix [A] is 'a given' in physical units. Equilibrium, therefore does not depend on the nature of disequilibrium but on the previous already given conditions of production expressed in [A] . There are nevertheless two important differences: While Nikaido's model abstracts from time, and its solution works as in a General Equilibrium framework, Benetti's model is explicit about the timing and disequilibrium process, although its stability analysis is confusing due to a changing condition of stability, which is introduced by the mathematical device used. Both these models emphasise that the whole process rests on the physical characteristics of production.

The models considered under items 1 and 2 can be represented in its stability conditions in a more general form as a process such that: $\mathbf{p_t = p_0\, e^{At} + \phi}$, where f is an external impact. Nevertheless, in both sets of models, there is no consideration for the impact of ϕ on matrix [A] as could be the case in a more Classical - Marxian -Schumpeterian model. Furthermore there is no room for the way in which the market process is incident on the formation of values, therefore prices of production are formed out of physical magnitudes and is not necessarily related to the notions of value and capital.

3.- Classical- disequilibrium models.

Kublin (1989), Ortiz (1994).

The main characteristic in these models is that equilibrium may be defined by structural considerations, but stability conditions are path dependent. Therefore, matrix [A] may provide for the identification of prices of production. Nevertheless stability conditions depend on the form in which the disequilibrium is processed through the market.

Two approaches:

classical: The market process follows such that disequilibrium express in a process of rationing that tends towards prices of production. (Kubin (1989).

Effective demand (Schumpeterian): Disequilibrium is expressed in the rates of profit, but the reallocation of capital can react upon matrix [A]. (Ortiz (1994)).

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