

# Money Is Time: The Monetary Expression of Value in Marx's Theory of Value

David Kristjanson-Gural

In this article, I derive the monetary expression of value based upon commodity money and use it to translate values and exchange values from units of labor into units of money. While this analysis has been done at the initial stage of Marx's analysis where he assumes that commodities exchange in proportion to their values, I derive the monetary expression of value at the more developed stage of Marx's 10 analysis where commodities exchange according to prices of production. I then develop a macroeconomic measure of the monetary expression of value and link the micro- and macroeconomic determination of the monetary expression of value. In so doing I provide a conceptual basis for defining the monetary expression of value using contemporary non-commodity money.

Key Words: Karl Marx, Money, Value

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## 1. Money and Value

The more than century-long controversy concerning Marx's theory of value has centered primarily on the question of whether or not it is possible logically to explain the relative prices of commodities on the basis of labor-time. The question of how money expresses labor-time has, until recently, gone relatively unnoticed in spite of the central role that money plays in Marx's exposition of his theory of value. In the last twenty five years, a number of theorists have re-examined the role of money and, as a result, have begun to argue for a monetary approach to Marx's theory of value, suggesting that only by understanding and incorporating Marx's theory of money is it possible to understand his theory of value.<sup>1</sup> A number of these theorists draw on the New Interpretation of the transformation problem and utilize, in particular, the concept of the

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<sup>1</sup> Early contributions include Rubin (1973), Rosdolsky (1954) and Colletti (1973); more recently Moseley (2004, 2005), Lapavitsas (2000), Saad-Filho (2002) and Fine, Lapavitsas and Saad-Filho. (2004).

monetary expression of value to convert value magnitudes from labor hours into units of money (Foley 1982, 2000, 2005; Dumenil 1983; Glick and Ehrbar 1987; Mohun 1994). Money, they argue, represents the necessary form of appearance of value; the monetary expression of value is thus a crucial theoretic concept Marx employs to translate value from its substance – abstract labor – to its form – money. Proponents of the New Interpretation, however, encounter difficulties in providing a theory of the *determination* of the monetary expression of value, relying instead on an *ex post* measure. Important questions have been raised concerning the adequacy of this concept to translate values from abstract labor to money magnitudes at the micro level. Some proponents of the New Interpretation have suggested that the monetary approach implies that Marx’s theory of value is confined to the macro analysis of value flows (Bellofiore, 1989). Others maintain that it provides a consistent account of values and prices at the micro level (Glick and Ehrbar 1987; Mohun 1994; Rieu 2006).

Over the same quarter century, a number of theorists have developed a post-structural approach to Marx’s value theory, an approach that maintains that values and exchange-values are overdetermined magnitudes that can be measured in both labor and money units. Extending the initial work of Wolff, Callari and Roberts’ (1984), these theorists offers new insights into several aspects of Marx’s theory of value including the related problems of abstract labor, the integration of demand into Marx’s theory of prices, crisis theory, the social constitution of value and commodity fetishism.<sup>2</sup> These theorists have provided many important insights into Marx’s theory of value but they do not explicitly theorize the means by which money expresses labor-time.

While they ostensibly adopt the *ex post* measure of the monetary expression of value proposed by the New Interpretation when translating between labor-time and money, they most often theorize

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<sup>2</sup> See Wolff, Callari and Roberts (1984), Roche (1985), Amariglio and Callari (1989), Cullenberg (1994, 1998), Garnett (1994), Roberts (1996, 1997; 2004, 2005), Biewener (1998), Callari, Roberts and Wolf (1998), Kristjanson-Gural (2003; 2005; 2007).

value and exchange-value as magnitudes of socially necessary abstract labor-time. As a result, some theorists working in the monetary approach have dismissed important contributions of the post-structuralist because they assume that money plays no role in the post-structuralist explanation. One purpose of this paper, then, is to overcome this objection to the post-structural approach to value theory by making explicit how money expresses value in a post-structural framework. By integrating the monetary expression of value into the determination of values and exchange-values in the approach developed by Wolff, Callari and Roberts, I will demonstrate that a post-structural approach can integrate money and, in fact, overcomes the difficulties encountered by the New Interpretation: it provides a theoretic basis for the determination of the monetary expression of value and not simply its *ex post* measure.

To proceed, I first must distinguish two related conceptual developments in Marx's value theory – the diachronic, or step-by-step development of the form of value (from exchange-value, to market-value, price of production and market-price of production) and the logical/historical development in the money form (from gold coin, to convertible private paper, state issued paper to non-convertible deposit money). The monetary expression of value developed by advocates of the New Interpretation sidesteps both conceptual developments by positing the monetary expression of value as a ratio of value-added defined by money prices to new (living) labor expended in the period. In so doing, the New Interpretation severs the link between Marx's analysis of the value of the money commodity (gold) and the monetary expression of value. Because it relies on market prices, neither does it integrate Marx's development of the form of value. I will argue that it is necessary theoretically to develop the monetary expression of value with reference to commodity money at the level of the analysis in which commodities are assumed to exchange at prices of production. It is then possible to define a macroeconomic measure of the monetary expression of value which is theoretically linked to its microeconomic measure base on gold. In this way the monetary expression of value is integrated within Marx's value theory.

Below I provide a consistent definition of the monetary expression of value using commodity money and use it to translate values and exchange-values from their expression in labor-time to currency units at the level of the analysis in which commodities exchange at prices of production. I thus overcome the objection that the post-structural approach fails to integrate the monetary expression of value and instead conceives of value and exchange-value primarily in terms of labor-time. I also provide a critique of the accepted view that the value and exchange-value of commodity money are only relevant to the determination of the monetary expression of value at the initial stages of Marx's analysis when commodities are assumed to exchange at their values.

Following this I provide a link between the microeconomic definition of the monetary expression of value and its macroeconomic expression. Specifically, I argue that at the macroeconomic level, the monetary expression of value is defined as the ratio of the total money prices to the total abstract labor of the commodities in circulation and that this ratio is related to the microeconomic expression based on the price of production of gold. I also provide a basis for the evaluation of efforts to define the monetary expression of value based upon non-commodity money. Specifically, I reject the proposal by proponents of the New Interpretation to define the monetary expression of value with reference to the net product in favor of a definition based upon the total product.

In the following section I will briefly examine how the monetary expression of value is conceptualized within the New Interpretation, how it has been adopted by the post-structural approach and some of the objections it has encountered. I will then define the monetary expression of value using commodity money in two stages – first at the initial level of Volume I of Marx's *Capital* when commodities are assumed to exchange at their values and then, at a later stage of Volume III, when commodities exchange at prices of production. In both cases, the monetary expression of value will be used to convert both values and prices of production from labor units (the intrinsic measure of value) to money units (the extrinsic measure). It will then be

possible to provide the theoretic link between the micro determination of the monetary expression and its macro measure. I will conclude with some comments on the implications of this analysis of the monetary expression of value for a number of contemporary theoretic issues surrounding Marx's theory of money.

## **2. The Monetary Expression of Value**

Two conceptual difficulties have hindered the development of the monetary expression of value. The first is that Marx develops his theory of money primarily with reference to commodity money. Marx argues that commodities express their values through exchange against a money commodity, gold or silver, which serves as a universal equivalent. The value of commodity money is determined by the socially necessary abstract labor-time required to produce it. But commodity money is no longer prevalent and so Marx's theory of money is considered to be antiquated; not relevant to understanding contemporary economies. One important theoretical problem facing Marx's theory of money, then, is to explain how money can express the values of commodities when it no longer itself takes the form of a commodity with a value.

A second and related conceptual problem concerns how money expresses values once commodities are assumed to exchange according to prices of production rather than values. Even if contemporary money took the form of gold, the following question would remain: how would gold express commodity values when commodities (including gold) exchange at prices of production that deviate from values? Marx's analysis of monetary exchange is almost entirely restricted to the case of exchange at values; an adequate development of the monetary expression of value must resolve this key issue.

The New Interpretation sidesteps both of these conceptual issues. It provides an *ex post* measure of the monetary expression of value as the ratio of value added to new labor expended (Foley, 1982; 2000, 2005). Proponents of the New Interpretation argue that this ratio adequately defines the exchange-value of money and applies equally to the assumption of exchange at values or to exchange at prices of production or even market prices (Glick and Ehrbar 1987; Mohun

1994, Rieu 2006). In this view the macro determination of value supersedes the analysis of commodity money and renders the determination of the value and exchange-value of commodity money irrelevant to Marx's theory of value. This move appears to eliminate both of the conceptual difficulties of defining the monetary expression of value at once. It also provides an empirically appealing *ex post* measure that allows for the translation from currency units to labor-hours.

Some questions have been raised, however, concerning the conceptual or theoretical justification of this definition and its relationship to other categories that Marx develops. Fine, Lapavistas and Saad-Filho (2004) argue that proponents of the New Interpretation arbitrarily separate the definition of the monetary expression of value (what they term the labor expression of money) from its determination, that they chaotically mix the levels of abstraction and that they are unable to show the implication of the difference between the value and exchange-value of money and how it affects the process of accumulation and how it may be implicated in crises and cycles.

On the other hand, earlier post-structuralist theorists acknowledge the qualitative importance of monetary exchange in Marx's theory. These theorists argue that values and prices of production have a dual measure – in hours and in currency units and they accept the determination of the monetary expression of value developed by Foley and indicate that that is sufficient to translate between value in hours and currency units (Callari, Roberts and Wolff 1998, 46) (Roberts 2005, 136). In their quantitative analysis, however, the post-structural theorists do not attempt to integrate the monetary expression of value and they analyze the relationship between value and exchange-value with reference only to labor hours (Roberts 1997, 2004, 2005; Kristjanson-Gural 2003). This discursive choice helps to emphasize their insistence that exchange-value should be conceived of as a magnitude of abstract labor in contrast to the traditional dichotomy of values in labor-time being transformed into prices of production in units of money (Roberts 2005, 135). It does, however serve to obscure the role of money in their

analysis. I argue here that a post-structural approach provides a means to address the problem of how commodity money expresses value at the level of analysis in which commodities are exchanged at prices of production and it thus provides a means to link the micro determination of the monetary expression of value with its macroeconomic expression. Using the *ex post* measure provided by the New Interpretation does allow a consistent translation between labor and money units, but it cuts off the further theoretic link between the micro analysis of price formation and the macroeconomic ratio. An analysis of this link is important for understanding contradictions between the form and function of money – both for commodity money and non-commodity money once it takes the place of commodity money.

In what follows, then, I will undertake an examination of the theoretic implications that post-structural theory has thus far overlooked – the implications of the diachronic development of the form of value for the monetary expression of value. To do so I will abstract from the historical development of the form money takes and assume a simple monetary system in which paper currency is convertible into gold. I will first briefly discuss the determination of the monetary expression of value in Volume I and then explain the implications of the changes in the category of value and exchange-value of money with the introduction of competition among industries and the formation of prices of production.

### **3. The Monetary Expression of Value**

#### ***3.1 The Monetary Expression of Value in Volume I***

From the beginning of Volume I of *Capital*, Marx argues that value is expressed in money. Initially this expression takes the form of exchange against a money commodity. Marx assumes commodities exchange according to their values - the socially necessary abstract labor-time required to produce them. The assumption of exchange at values allows Marx to develop the conceptual basis of the theory of value and show how commodity money serves to express the exchange-values of commodities while abstracting from the complications that result from

considering exchange in its more developed form (Mohun 1994; Wolff, Callari and Roberts 1984).

What distinguishes monetary approaches to Marx's theory of value is the idea that money is not simply a numeraire; instead it is a central component of a commodity producing economy because it represents the means by which private, independent expenditures of labor are articulated into a social division of labor. Only by means of exchange is the labor expended on the production of a commodity commensurated with other private labors. What distinguishes the monetary approaches from traditional value theory is the emphasis on the role of monetary exchange in effecting a social division of labor and in reducing concrete labor to abstract labor. Value is not determined solely in production but in the articulation of production and exchange and this aspect or characteristic of the concept of value is present from the early stages of Marx's development of value (Rodriguez-Herrera 1994).

In Chapter III of Volume I of *Capital*, Marx argues that gold serves as a universal equivalent and expresses the values of commodities because it itself is a commodity with a value (1954, 97). Gold still functions as a particular commodity, in the production of jewelry for example, but, in its role as money, gold is expelled from the world of commodities and stands apart from them as money in order to measure their values. The value of one unit of gold, determined by the socially necessary abstract labor-time each unit of gold requires for production, can thus be used to express the value of each of the other commodities with which it exchanges (1954: 95). In order to express the exchange-values in currency units, gold may be assigned a currency equivalent: so many ounces of gold are set equal to so many units of currency. This rate of conversion of gold into currency units Marx calls the standard of price (Marx 1954, 100).

The monetary expression of value, at this stage of the development of value, is simply the ratio of the standard of price (x units of currency per ounce of gold) to the value of gold (y hours of labor per ounce of gold). The monetary expression of value thus defines the number of units of currency per hour of socially necessary abstract labor-time (Saad-Filho 2004). Multiplying the

value of a commodity by the monetary expression of value converts the value in hours into units of currency. Since, at this level, the value and exchange-value are equal, this magnitude also represents the commodity's exchange-value. For the remainder of his analysis in Volume I, Marx takes for granted the concept of the monetary expression of value and he uses it to convert freely between value in hours and currency units (1954, 189; 199; 300). Throughout the analysis he assumes that gold serves as the money commodity and that its value is given (Marx 1954, 120).

Algebraically, the values of commodities can be expressed in either hours or currency units according to the following three definitions:

$$(1) \quad m_i \equiv p_s / v_s$$

$$(2) \quad v_i^s \equiv v_i^t m_s$$

$$(3) \quad v_i^t \equiv v_i^s / m_s$$

Where:

$m_s$ : monetary expression of value assuming exchange at values (dollars per hour of socially necessary abstract labor-time)

$p_s$ : Standard of price (dollars per ounce of gold).

$v_s$ : Value of gold in hours of socially necessary abstract labor-time.

$v_i^t$ : Value of commodity i in hours of socially necessary abstract labor-time.

$v_i^s$ : Value of commodity i in dollars.

A change in the monetary expression of value can result from a change in the standard of price, either directly, as the direct result of a change in the official rate of exchange of currency units to gold, or indirectly, in the case of the issuing of new convertible paper currency without a corresponding increasing in gold production (Marx, 1954, 101; Moseley 2004). It could also vary with changes in the conditions of production in the gold industry (Fine, Lapavitsas and Saad-Filho 2004). The monetary expression of the value of commodities thus acquires a relative independence from value even at this initial stage of the analysis (Marx 1954, 104).

A more concrete analysis of the relative autonomy of money prices requires the further development of the categories of value and exchange-values including the consideration of competition between industries and the formation of prices of production. Unfortunately, most of Marx's examples in which he converts value from abstract labor hours into currency units occur at this level of abstraction when Marx takes as given the monetary expression of value and commodities are exchanged at their values.<sup>3</sup> He does not return to any analysis of the monetary expression of value in spite of its obvious conceptual importance and in spite of the fact that many of his quantitative examples at the level of prices of production are denominated in currency units and not labor-time. The question, then, of how the monetary expression of value is determined at the next level of diachronic development, when commodities including gold exchange at prices of production, remains to be explored.

### ***3.2 The Value and Exchange-Value of Commodity Money***

In Volume III, Marx introduces into the analysis competition among producers in different industries and, at this stage, the exchange-value of the commodity can no longer be assumed to be equal to its value. How does this change in the relationship between value and exchange-value affect the monetary expression of value? The value of commodities continues to be determined by the socially necessary abstract labor-time required to produce them. The exchange-value continues to be defined by the amount of socially necessary abstract labor the commodity represents in equivalent exchange. Now, however, the condition defining equivalent exchange must take into account competition among capitals in different industries operating with different ratios of constant to variable capital. Equivalent exchange in this expanded context is exchange at ratios that give the average capital in the industry a rate of profit equal to the general

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<sup>3</sup> In one exception Marx (1968, pp. 388-90) assumes for simplicity that the industry in question has an average composition and therefore the value and price of production do not diverge (Ramos-Martinez 1994).

rate of profit. The price of production defines the socially necessary abstract labor that each commodity represents in equivalent exchange when exchange is assumed to occur at ratios that would result in each industry receiving an equal average rate of profit.

Because the inputs into production must be acquired through exchange and exchange is assumed to occur according to prices of production, the value that they transfer to production is now determined by the price of production of the means of production rather than their value. This insight is due to the recognition that the commodities are produced as products of capital, not simply as use-values (Wolff, Callari and Roberts 1984; Rodriguez-Herrera 1994). The system of equations used to determine the value and exchange-value of commodities is therefore given as follows:<sup>4</sup>

$$(4) \quad \mathbf{v}^i \equiv \mathbf{p}^i \mathbf{A} + \boldsymbol{\lambda}$$

$$(5) \quad \mathbf{p}^i \equiv \mathbf{p}^i [ \mathbf{A} + \mathbf{b}\boldsymbol{\lambda} ] (1+r)$$

$$(6) \quad \mathbf{p}^i \mathbf{y} \equiv \boldsymbol{\lambda} \mathbf{x}$$

Where:  $\mathbf{v}^i$ : row vector of labor values

$\mathbf{A}$  : matrix of physical commodity inputs per unit output

$\boldsymbol{\lambda}$  : row vector of new labor inputs per unit output

$\mathbf{p}^i$  : row vector of prices of production in hours of labor-time

$\mathbf{b}$  : column vector of wage goods advanced per hour

$r$  : general rate of profit

$\mathbf{y}$  : column vector of net output

$\mathbf{x}$  : column vector of gross output

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<sup>4</sup> These equations are presented as identities since they define the relationships among these various concepts (Callari, Roberts and Wolff 1998).

Equation (4) defines the value of commodities. It states that the socially necessary labor-time required to produce each commodity is given by the sum of the price of production of the non-labor inputs and the new labor expended in production. Equation (5) defines the prices of production, the socially necessary labor each commodity represents in equivalent exchange. It is determined as the quantity of labor that each commodity would represent in order that each industry receives an equal average rate of profit ( $r$ ). In order to determine the magnitudes of the values and prices of production, these equations are subject to a net product normalization expressed in equation (6). It states that the sum of the prices of production of the net product ( $\mathbf{p}\cdot\mathbf{y}$ ) denominated in labor hours must equal the sum of the new labor expended ( $\lambda\mathbf{x}$ ). Note that both values and prices of production are denominated in socially necessary abstract labor hours and that the latter act to define the amount of value transferred in production by the means of production. In this approach, therefore, the magnitude of value is not determined independently from the process of exchange; rather it is through the process of exchange that the concrete labors are validated as part of the social division of labor and as such they count only in relation to the social whole. These average or homogenous labor units are allocated to each industry on the basis of the size, composition and turnover time of the capitals. Each capital can thus be conceived of as an aliquot part of the total social capital according to its relation to the other capitals (Roberts 2004).

This post-structural analysis also provides a theoretic basis for the further development of the monetary expression of value. When gold is exchanged according to its price of production, the price of production of gold (denominated in units of abstract labor) is the amount of socially necessary abstract labor one unit of gold represents in equivalent exchange. Like any other commodity, this magnitude of abstract labor will, in general, differ from its value – the abstract labor socially necessary for its reproduction in that period. The difference between the latter value magnitude and the price of production represents a per-unit gain or loss in value for the

gold industry that occurs as a result of the tendential equalization of the rates of profit across industries. Because commodities values deviate from exchange-values, the value of gold is no longer able to serve as a means to convert the values and exchange-values between labor and currency units.

The exchange-value of gold, however, represents an aliquot part of the total social labor each unit of gold represents in equivalent exchange. This amount of abstract labor is attributed to gold via its relationship to the other industries' capitals. The capital advanced and new labor expended in the gold industry participate in the determination of value and exchange-value of all the commodities, gold itself included, as aliquot parts of the total social labor. Gold acquires a value and exchange-value on the basis of the proportion of total social labor required to produce it and the proportion of value it represents in equivalent exchange – an exchange that gives the capital advanced in the gold industry a rate of profit equal to the social average. This latter magnitude serves to measure the value of other commodities with which it exchanges: their prices of production can be expressed as a fraction or multiple of a unit of gold and converted into a currency price via the standard of price.

So while gold no longer acts in isolation to measure commodity values by itself, it can and does act, through its participation as a commodity in the production and allocation of the total social labor, to measure the values and exchange-values of commodities and to express them in units of currency via the standard of price. As such it provides the basis for the determination of the monetary expression of value at this more developed stage of the analysis.

### ***3.3. The Determination of the Monetary Expression of Value***

The monetary expression of value as expressed in equation (1) above is inadequate to express values and exchange-values at this diachronic stage of the analysis since it is predicated on the exchange at values not at prices of production. However, it is possible to derive the price of production of gold as a magnitude of abstract labor. In this way the monetary expression of value can be defined at the level of analysis in which exchange is assumed to occur based upon

prices of production rather than values. The monetary expression of value at this stage in the development of the theory is defined by the ratio of the standard of price to the price of production of gold. Using this ratio, it is possible to represent the values and the exchange-values of the commodities in currency units using the monetary expression of value according to the following definitions:

$$(7) \quad m_r \equiv s_r / p_r$$

$$(8) \quad \mathbf{v}^s \equiv \mathbf{v}^v m_r$$

$$(9) \quad \mathbf{p}^s \equiv \mathbf{p}^v m_r$$

Where:

$m_r$ : monetary expression of value assuming exchange at prices of production (dollars per hour of socially necessary abstract labor-time)

$s_r$ : standard of price (dollars per ounce of gold).

$p_r$ : the price of production of gold in units of socially necessary abstract labor-time

$\mathbf{v}^s$ : the vector of values expressed in dollars.

$\mathbf{v}^v$ : the vector of values expressed in labor-units as defined in (4) above.

$\mathbf{p}^s$ : the vector of prices of production expressed in dollars.

$\mathbf{p}^v$ : the vector of prices of production expressed in labor-units defined in (5) above.

The first identity (7) defines the monetary expression of value at the level of abstraction of prices of production. It defines the number of dollars represented by each hour of socially necessary abstract labor-time when exchange takes place on the basis of prices of production rather than values. The monetary expression of value can then be used in (8) and (9) to translate values and prices of production, respectively, between hours of labor and units of currency.

The price of production of gold only coincides with its value in the restricted case that the organic composition in the gold industry equals the industry average. Only in this restrictive case will  $m_r = m_p$ . In the general case, the price of production of gold will deviate from its value and the

monetary expression of value (defined by  $m_r$ ) will be higher or lower than that based on the value of gold (defined by  $m_g$ ) in the earlier stage of the analysis. The *exchange-value of gold*, not its value, represents the amount of socially necessary abstract labor-time of each unit of gold represents in exchange. In a commodity money system this magnitude determines the monetary expression of value. It is therefore possible to determine the monetary expression of value with reference to the money commodity even when we assume exchange at prices of production and to use this expression consistently to convert values and exchange-value from units of labor-time into units of currency.

### ***3.4 The Macro Measure of the Monetary Expression of Value***

The determination of the monetary expression of value with reference to gold also makes it possible to theorize the relation between the monetary expression of value based upon the money commodity and its macroeconomic expression. Marx argues, contrary to the quantity theory of money, that the quantity of money in circulation adjusts to the requirements of commodity exchange through the process of hoarding and dishoarding (Roche 1986; Lapavistas 2000a). The total money required to exchange commodities in a period will depend upon the average velocity of money in circulation as well as the prevalence of trade credit. Abstracting from the effects of trade credit the quantity of money in circulation can be written as follows:

$$(10) \quad m \cdot v = \mathbf{p} \cdot \mathbf{x}$$

Where

$m$ : quantity of money in circulation

$v$  : average velocity of money

Substituting from equation 9 above and solving for  $m_r$  results in:

$$(11) \quad m_r \cdot v / \mathbf{p} \cdot \mathbf{x} = m_r$$

Assuming that commodities are exchanged at price of production,  $m_r \cdot v$  equals the total prices of production of commodities exchange in the period;  $\mathbf{p} \cdot \mathbf{x}$  is the sum of the abstract socially

necessary labor-time represented by the gross output. The ratio of these two magnitudes equals the monetary expression of value determined with reference to the commodity money – gold. The equation of exchange thus provides a link between the microeconomic determination of the monetary expression of value and its macroeconomic expression.

#### **4. Theoretical Implications and Directions for Further Research**

This analysis provides support for two claims that are at odds with the previous attempts to define the value of commodity money. The first claim is that the price of production of gold can be used to define the monetary expression of value on the micro level – a claim that earlier theorists have rejected. The second claim is that it is possible to define a macroeconomic expression of the price of production of gold – an expression defined by the ratio of the total money prices to the total abstract labor represented in the total output. Here, I will briefly explore the theoretical implications of these two claims.

The claim the value of gold is not relevant to the determination of the monetary expression of value once prices of production are introduced into the analysis can be seen to be only partly true. It is true that the monetary expression of value does not serve, at this level of analysis, to reduce the value or exchange-value of a commodity to the value of gold. It does not reflect the amount of socially necessary abstract labor required to produce one ounce of gold, but the amount that each unit of gold represents in equivalent exchange. Each ounce of gold thus represents an aliquot part of the total social labor and this amount can be compared with the requirements for the production of gold to see the value gained or lost by gold producers due to the specific production conditions in the gold industry. In its role as money, however, gold serves to express the values and exchange-values of the other commodities not with reference to the conditions of production in the gold industry but with reference to each commodity's claim on the total social labor relative to gold.

It is not true, therefore, that the price of production of gold is irrelevant to the determination of the monetary expression of value as some have claimed (Saad-Filho 2002, 98-

9). Nor is it true, however, that the price of production of gold serves as a means to convert values in labor hours into prices of production in currency units. The monetary expression of value serves to express both value (the socially necessary abstract labor-time required to (re)produce the commodity) and prices of production (the socially necessary abstract labor-time the commodity represents in equivalent exchange) from labor units into currency units. It is defined with reference to the value of gold in the case that commodities exchange at their values and with reference to the price of production of gold when commodities exchange at prices of production.

This analysis implies that changes in the price of production of gold will affect the monetary expression of value and thus the general price level. Since each commodity expresses its value and price of production in gold, a change in the price of production of gold does not affect relative prices. However, it will affect the general price level as well as the transfer of value into and out of the gold industry. Speculation and new discoveries of gold may result in an increase or decrease in the market-price of production of gold resulting in excess or insufficient profit in the gold industry. The response of the monetary authorities to changes in the value and price of production of gold may result in gains or losses in value and changes in the monetary expression of value that impact the process of accumulation. This analysis thus links the changes that occur in the monetary sphere with changes that occur in accumulation. The failure to provide this link is one basis of the critique of the approach of the New Interpretation (Fine, Lapavistas and Saad-Filho 2004, 7; Itoh 2005, 187-8).

In order further to elaborate this concept it would be necessary to consider the determination of the monetary expression of value at the next diachronic stage, the stage at which exchange takes place on the basis of market-prices of production. At this stage the second aspect of socially necessary labor-time comes into play – labor expended in accordance with existing social need – and equivalent exchange must take into account whether private labor expended is in proportion to the demand for it (Kristjanson-Gural 2003). In this way it would be possible to

demonstrate the redistribution of value that occurs as a result of changes in demand and supply for the money commodity as well as to theorize how this value enters and leaves circulation. The theoretical development of the exchange-value of commodity money thus provides a means by which the static determination of value and exchange-value can be linked with a dynamic analysis of cycles and crises.

The second result of this analysis is that the monetary expression of value ought to be defined with reference to the total product rather than the net product as the New Interpretation suggests. In order to express the values and exchange-values of commodities in currency units it is necessary to take into account the gross output and to determine the number of times a unit of gold is required to circulate in order to socially validate that gross output. The ratio of the total circulation of a unit of gold to the total output provides the link between the monetary expression of value at the micro level and its macroeconomic measure. By defining the monetary expression of value with reference to ratio of the net product to new labor expended, the New Interpretation cannot make a link between the price of production of the money commodity and the total value it circulates in the period.<sup>5</sup> Thus the theoretic underpinning of the monetary expression of value in their approach is missing.

The present analysis thus provides an important theoretical link between the concept of the monetary expression of value of commodity money, and the macroeconomic expression. For this reason, it is possible to use this analysis to assess how non-commodity money expresses

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<sup>5</sup>While the determination of the monetary expression of value that must be undertaken with reference to the total rather than the net product, the use of either a net or a gross product *normalization* to solve for values and prices of production is valid. Since the net product normalization expressed in equation #6 above also implies that the total value and total prices of production will be equal, i.e. that  $\mathbf{v} \cdot \mathbf{x} = \mathbf{p} \cdot \mathbf{x}$ , either normalization will permit the determination of values and prices of production.

value. In order to do so, two further developments are needed. First, it will be necessary to theorize the effects of trade credit and deposit money on the quantity of money in circulation in a dynamic context. Second, it will be necessary to show how the functions of money (means of circulation, store of value; means of payment) produce contradictions in the form money takes (commodity money, convertible paper, inconvertible deposits) and how these contradictions result in an evolution in the form of money from commodity money to non-commodity money. In fact Lapavistas (1991; 2000b) provides much of the analysis necessary to link these two conceptual developments. The analysis of the evolution in the form of money and the adequacy of the ability of non-commodity money to express value can be evaluated in part with reference to the monetary expression of value derived above.

## **5. Conclusion**

Utilizing the post-structuralist approach to the relationship between value and exchange-value, the price of production of gold can be used to provide the basis for a microeconomic definition of the monetary expression of value. The monetary expression of value can be then used to translate both values and exchange-values from labor to money magnitudes at the level of analysis in which commodities are assumed to exchange according to prices of production.

Using the equation of exchange it is possible also to derive a macroeconomic expression of the monetary expression of value. The derivation of the macroeconomic expression suggests that the proposal to define the monetary expression of value with reference to the ratio of the value-added to the new labor expended ought to be rejected. The macroeconomic expression provides a theoretic basis to evaluate attempts to integrate non-commodity money as well as to analyze changes in the monetary expression of value in a dynamic context.

Money plays an important role in Marx's theory of value and a post-structural approach is able to provide a consistent theoretic account of money. The theory suggests that in the context of capitalist commodity exchange, money is time – it represents a portion of society's abstract labor-time. It does not count as labor-time directly; it fulfils its function only in the context of

the exchange of commodities. Capitalist commodity exchange is thus conceived of as a particular means of comparing concrete labors and measuring them against the complex confluence of the totality of society's labor. More work needs to be done to elaborate this understanding of the role of money and the post-structural approach provides a means to undertake a further theoretical elaboration.

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