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Abstract

The new interpretation (NI) of the labor theory of value has raised awareness among Marxist economists that the value of money must be incorporated in a coherent manner into any solution that is proposed to the longstanding transformation problem. The author proposes a new inconvertible or fiat money form of value that extends Marx’s theory of money in a manner that is consistent with his theory of capitalist exploitation. The fiat money form of value provides a theoretical justification for the value of money that is distinct from, yet consistent with, the NI’s definition of the value of money. Commodity values are then transformed into prices of production in such a way that unifies the NI with the single system interpretation associated with Wolff, Callari, and Roberts and the traditional dual system interpretation associated with Sweezy and Bortkiewicz.

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To identify oneself as a Marxian economist these days working on issues like the “transformation problem” and the value of inconvertible paper money is to experience a sort of scholarly schizophrenia. One cannot help but feel that one’s pattern of thinking must be taking wrong turns with so much disagreement and debate about these key issues. Like so many others, however, I have been eager to participate in this discourse for an extremely paradoxical reason: Marxian economic theory, put simply, seems to make so much sense. It is remarkable that one is able to feel this way in the context of such deep disagreement about core theoretical issues—hence, the schizophrenia.

My contribution to our collective struggle aims to complicate matters further by attempting to unify a number of approaches that have been previously deemed irreconcilable. This approach has the obvious benefit of encouraging consensus on issues that have created considerable division within the Marxist camp. On the other hand, the reasoning must be deemed sound if any benefits at all are to be had. I will thus proceed carefully in an attempt to begin building bridges where previously none have seemed to exist.

Section 1 outlines what the author considers to be the two most pressing theoretical problems facing Marxian theory at the present time: the transformation problem and the determination of the value of money in the case of pure fiat money. The section also identifies the criteria for acceptable solutions to the two problems. Section 2 begins to develop a new form of value, termed the inconvertible or fiat money form of value, as a means of incorporating valueless paper money into Marxian theory in a way that is consistent with Marx’s claim that surplus value arises from the exploitation of labor-power in the production process. Accompanying this new form of value is a new
price-form, termed the inconvertible or fiat money price-form, which provides a specific expression for the value of an individual commodity in terms of a specific quantity of inconvertible paper money. This treatment of the value of money is clarified with a straightforward example of a simple capitalist economy and is related to the New Interpretation (NI) of the labor theory of value associated primarily with Foley (1982) and Dumenil (1984). Whereas the NI only provides a definition for the value of money, the definition proposed in this section can be justified theoretically while remaining consistent with the NI’s definition of the value of money.

Section 3 addresses the transformation problem debate by attempting to unify two seemingly contradictory approaches to that problem: the dual-system approach associated with Bortkewicz (1949) and Sweezy (1970) and the single-system approach associated with Wolff, Callari, and Roberts (1984). It is argued that Borkiewicz and Sweezy abandoned the most theoretically sound approach to their problem after brief consideration of it and then further failed to properly consider the nature of value in Marx’s theory. Rather than rejecting each other’s insights, these two perspectives should combine their strengths to supply the radical solution to the problem that Wolff et al. promise to deliver. The proper solution is provided in a manner that is consistent with the NI’s definitions for the value of money and value of labor power while also maintaining respect for the original definitions of those concepts. A proper interpretation of the results allows us to finally put to rest concerns related to the failure of the invariance conditions to hold. These concerns are, in fact, little more than misguided attempts to merge the appearance of things with their underlying reality for fear that failure to do so marks a denial of capitalist realities. The final section concludes.
1. Criteria for Sound Solutions to Fundamental Problems of Marxist Theory

In the introduction to his collection of essays on Marx’s monetary theory, Fred Moseley (2005) has posed clearly the key problems facing Marxian monetary theory. First, a theory of non-commodity money must be developed that is consistent with Marx’s labor theory of value. Additionally, the causal relationship between prices and the quantity of money must be clearly elaborated in the case of a non-commodity money system (2005(1): 17). Given the importance of the first problem, in particular, Moseley makes a surprising admission about the contributors in his book, specifically that while most authors agree that money need not be a commodity in Marx’s theory, those who adopt this position do not provide an explanation for how the value of money or the monetary expression of labor time (MELT) is determined in the case of pure non-commodity money (2005(1): 15). This problem is arguably more serious than the famous transformation problem because it threatens the coherence of the labor theory of value at the level of simple commodity circulation. If a commodity representing socially necessary abstract labor time is equated with a valueless piece of paper that is not the direct representative of a money commodity, then does not this equation render impossible any rational explanation for the magnitude of paper for which the commodity exchanges?

The question that arises is which criteria must be satisfied in order to render comprehensible the compatibility of the Marxian law of value and the reality of fiat money. The first condition is that fiat money must be interpreted as a form of value, albeit a strange and complex form, that is related to the forms of value Marx analyzed in
diagrammatic fashion. The second condition is that this form of value must specify the sense in which commodity values are being expressed and measured in qualitatively different commodities. Without this specification, no equivalence exists because, again, fiat money is valueless and so the form of value becomes incomprehensible. Finally, the precise quantity of fiat money for which a commodity exchanges must be the direct and natural implication of this specification of the nature of the equivalence of commodity values. If these conditions are fulfilled, then fiat money prices lose their mysterious character.

The much-studied transformation problem is the second problem that has consumed the energy of both Marxian and non-Marxian economists for many decades. The literature is obviously vast and there is no need to review it here, nor is it necessary to defend the claim that Marxists urgently require a satisfactory solution to this problem. What constitutes a satisfactory solution to the transformation problem? The first condition is that whatever solution is proposed must directly address Bohm-Bawerk’s (1949) famous criticism of Marx that Volumes 1 and 3 of *Capital* stand in glaring contradiction to one another. The alleged contradiction, of course, is that the transformation of values into prices of production implies that commodities actually do not exchange in proportion to the quantities of labor required for their production as Volume 1 of *Capital* asserts. In their two volume *History of Marxian Economics*, Howard and King (1989: 50-51) were able to report that Bohm-Bawerk’s critique of Marx remains among the most cogent of all orthodox critiques of the Marxian analysis of value.
The second requirement for a satisfactory solution to the transformation problem is that regardless of the solution that is proposed, it must acknowledge the validity of the formulation of that problem as Bortkiewicz (1949) and Sweezy (1970) specify it.\(^1\) Marx’s two-department model in Volume 2 of *Capital* indicates clearly that sector level models based on simple reproduction were compatible with his method of analysis. To argue that the transformation of values into prices of production should not be considered in that context avoids rather than confronts the problem at hand. A third condition is that the proposed solution must incorporate money, especially fiat money, into the analysis in a more obvious way so as to reflect the historically contingent form of appearance of money that now prevails. As a result, the next section develops this form of value before confronting its specific role in the process of the formation of a general rate of profit.

Before proceeding to the analysis of the fiat money form of value, two additional considerations should be acknowledged in the effort to arrive at a satisfactory solution to the transformation problem. First, if at all possible, the solution must be as accessible to working people as possible. We must not fall into the trap of using sophisticated mathematics as a means of control over the discourse of political economy. David Laibman (2002: 164-165) has identified “mathematicism” as one of a number of false trails that have been pursued in the investigation of the transformation problem. That is, we must not allow the mathematically super-skilled to monopolize the analysis of economic appearances as has been the case in mainstream analysis. For Marx, this

\(^1\) I refer here only to the dual system interpretation and in no way mean to dismiss Fred Moseley’s (2005(2)) concerns about the treatment of the gold sector in their transformation procedure.
consideration outweighed everything else (Althusser, 1997: 9). In a related vein, our solution to this longstanding problem must permit Marxian theorists to move forward in the analysis of the even more complex appearances of capitalist reality.

2. The Fiat Money Form of Value

In Volume 1 of *Capital*, Marx devotes the entire first chapter to a lengthy and difficult analysis of the commodity and the forms through which its value is expressed both qualitatively and quantitatively. His diagrammatic method of exposition for the various forms of value ends with the money form of value, which equates each commodity within the entire span of distinct commodities (taken in appropriate quantities) with a definite quantity of the money commodity. This equivalence is only possible, of course, because each commodity represented contains exactly the same quantity of socially necessary abstract labor time as the quantity of the money commodity with which each is equated.

It is regrettable that Marx does not continue with his diagrammatic method of representation in an effort to discuss another form of appearance of value: the fully convertible paper money form of value. The problem that is encountered if one proceeds in this manner is that one cannot simply replace the quantity of gold in the money form of value with a specific quantity of paper money. At first glance, no basis exists for equating each commodity with a qualitatively distinct object requiring essentially no labor time for its production or for determining the specific quantity of fiat money that serves to measure the value of each commodity. The solution to the qualitative problem is immediately handled by acknowledging that fully convertible paper is the symbolic representative of the money commodity so that it is really each commodity and the
money commodity that are being equated. The paper thus reflects the value of the money commodity making possible a qualitative equivalence between each commodity and the money commodity.

The quantitative problem posed, however, requires that we reflect on the entire quantity of gold to which the fully convertible paper represents a claim. In this case, the total supply of paper money in circulation reflects the total stock of gold held in reserve and promised in payment to the holders of paper. Hence, each aliquot part of the total circulating paper money supply represents an equivalent aliquot portion of the total gold stock. As a result, when a commodity exchanges for a specific quantity of paper money, the equation of exchange is between the commodity and the quantity of gold that the paper price represents even though the appearance is that of equivalence between a commodity and a specific quantity of paper. The only reason this relation is possible at all is that both the commodity and the gold that is represented require the same quantities of homogenous human labor for their production. Furthermore, the paper serves to reflect the value of the gold so that it can serve as the imaginary expression of value for the commodity seller.

A diagrammatic representation of this fully convertible paper money form of value demands that we broaden our purview to include the entire mass of circulating commodities. This case is represented below in Figure 1.
In Figure 1, \( (C_1, C_2, \ldots, C_n) \) represent the total quantities of \( n \) commodities that have been exchanged for paper money where the corresponding \( n \) prices are denoted as \( (m_1), (m_2), \ldots, (m_n) \). Assume that these \( n \) commodities represent all commodities that have been sold during a given period of time and that the velocity of money in circulation is equal to 1. Of course, the paper money prices serve as symbolic representations of specific quantities of the money commodity, gold. The gold prices corresponding to each of the \( n \) commodities are thus \( (G_1, G_2, \ldots, G_n) \).

A number of key differences stand out between this form of value and Marx’s general form of value and money form of value. The most obvious difference is that this form of value requires the use of three categories of terms: commodities, money, and paper. Also, unlike Marx’s exclusive emphasis on the relative and equivalent forms of value, this form of value also includes a *reflected equivalent form* of value (i.e., paper). It is also critical to remember that the paper money prices are not part of the equation but instead only make the relation of exchange possible. A final distinction that is the most important distinction for the further development of Marxian monetary theory is the *necessity* of expanding the representation of this form of value to include all of
commodity circulation. The general and money forms of value expressed the values of the entire universe of commodities in a common price by taking them in the appropriate quantities. In the case of the convertible money form of value it is impossible to arrive at the money price of a specific commodity without taking into account the totality of commodity circulation. This point requires further elaboration because it suggests a modification of the price-form.

Once Marx develops the money form of value, he immediately introduces the price-form as the expression of an individual commodity value in a specific quantity of gold requiring the same amount of labor time for its production (1976: 163). The price-form corresponding to the money form of value can be expressed clearly for a specific commodity t as:

\[
P_t^G = \frac{x oz. \text{ gold}}{1 \text{ hr of labor}} \cdot \frac{y \text{ hrs labor}}{1 \text{ unit of } t}
\]  

(1)

In equation (1), \( P_t^G \) is the gold price of 1 unit of commodity t, x oz. gold/1 hr of labor represents the monetary expression of labor time (MELT) or the inverse of the value of gold, and y represents the number of labor hours required to produce one unit of commodity t. In the case of the convertible paper money form of value, the price-form is expressed rather differently for commodity t as:

\[
P_t^S = \frac{(m)}{G} \cdot \frac{x oz. \text{ gold}}{1 \text{ hr of labor}} \cdot \frac{y \text{ hrs labor}}{1 \text{ unit of } t}
\]  

(2)

In equation (2), \( P_t^S \) is the paper price of 1 unit of commodity t, (m) is the sum of all circulating paper money and is equal to \((m_1) + (m_2) + \ldots + (m_n)\), and G is the sum of all gold maintained in reserve (implicitly circulating) and is equal to \(G_1 + G_2 + \ldots + G_n\).

The convertible money price-form shows clearly that the paper price of commodity t
depends upon the total quantity of gold that implicitly circulates and the total quantity of paper that circulates in its absence. This paper money price-form is not a mere definition. Its determination is implied in Figure 1 above. The convertible money form of value thus requires reference to the entire sphere of circulating commodities and implicitly circulating gold.

Before proceeding to the inconvertible paper money form of value, the convertible paper money price-form must be elaborated for the purposes of comparison. Equation (2) may be written as:

\[
P_t = \frac{(m)}{G} \cdot \frac{x \text{ oz. gold}}{1 \text{ hr of labor}} \cdot \frac{y \text{ hrs labor}}{1 \text{ unit of } t} = \frac{(m)}{L_G^C} \cdot \frac{y \text{ hrs labor}}{1 \text{ unit of } t} \]

In Equation (3), \(L_G^C\) is the total socially necessary abstract labor time that is realized through exchange as gold circulates implicitly. As a result, the paper price of commodity \(t\) may be written as a fractional reflection of the aggregate value of gold implicitly in circulation. Whereas Marx wrote that 20 yards of linen = 2 ounces of gold, we can write 1 unit of \(t\) = \(j\) units of \((m)\) where \(j\) is the numerator derived in equation (3). This modified price-form is only comprehensible once the convertible money form of value is completely developed. Convertible paper money thus serves as a means of circulation but also as a measure of value (albeit reflected value).

Inconvertible paper money appears to present the greatest challenge of all to Marxian value theory. How can a commodity’s value be expressed in a particular quantity of inconvertible paper money or fiat money? In this case, paper money no longer serves as the direct representative of gold or as a claim to gold. It does represent, however, a claim to a specific quantity of any commodity available in the market. Just as
fully convertible paper reflects the value of gold, inconvertible paper reflects the value of all circulating commodities. Commodities are thus directly equated by means of the reflective power of inconvertible paper. The inconvertible money form of value is analogous to the convertible money form of value and may thus be represented similarly as in Figure 2 below.

\[
\begin{array}{c}
C_1 \\
C_2 \\
\vdots \\
C_n \\
\end{array}
= \begin{array}{c}
C_1^\ast (m_1) \\
C_2^\ast (m_2) \\
\vdots \\
C_n^\ast (m_n) \\
\end{array}
\]

Figure 2: The Inconvertible Paper Money Form of Value (or the Fiat Money Form of Value)

In Figure 2, all definitions are the same except that now in place of the implicit gold prices is the entire mass of circulating commodities. As with any reflection, however, the image that the inconvertible paper produces is a transposition of the reality that produced it. That is, the quantities of the n commodities that have their values reflected, listed as \(C_1^\ast, C_2^\ast, \ldots, C_n^\ast\), are qualitatively distinct from their real counterparts. Of course, this must be the case because no commodity can express its value in a commodity that is qualitatively identical to it. It is true that each commodity has yet to be transformed into the qualitatively distinct commodity on the opposite end of the commodity circuit that has been initiated. This distance from the equivalent form of value did not create any problems in the case of convertible paper money nor should it in this case. So long as the reflected equivalent form of value (i.e., the paper) is capable of
reflecting undifferentiated human labor, it does not matter in the slightest that this mass of human labor was expended in the production of the most diverse collection of commodities.

It is now possible to render the inconvertible paper money price-form comprehensible. For commodity $t$, the price-form may now be written as:

$$P_t^s = \frac{(m)}{L_C^C} \cdot \frac{\text{y hrs labor}}{1 \text{ unit of } t} = \frac{L_C^C}{1 \text{ unit of } t}$$

In equation (4), $L_C^C$ represents the total quantity of socially necessary abstract labor time that is required for the production of the total mass of circulating commodities. The close relationship to the convertible paper money price-form should not be overlooked. Although the total circulating paper money supply $(m)$ now reflects the total value of circulating commodities rather than the total value of (implicitly) circulating gold, the two price-forms are otherwise identical. Furthermore, because the labor embodied in the total circulating commodities $(L_C^C)$ is realized with a value equivalent in the form of gold $(L_G^C)$ in the case of fully convertible paper money, the two price-forms are identical after all appearances have been stripped away. This result should come as no surprise given the metamorphosis, $C - M - C'$, with which we are so familiar. One unit of commodity $t = j$ units of $(m)$ as before. The fiat money price-form is thus a fractional reflection of the aggregate value of commodities in circulation.

As in the case of the convertible money form of value, the fiat money form of value is not merely definitional. The value reflected in the form of paper money is determined within the sphere of circulation. The notion that commodities exchange for a fraction of the paper money supply exerts itself as a regulatory law of capitalism because
deviations from that law lead to attempts to restore it. Adjustments to restore paper prices as fractions of reflected value are essential because the routine and regular exchange of equivalent commodity values is only possible in that case. Commodity owners need not be aware of this particular law when engaged in market exchange. The pressures exert themselves independently of the conscious intentions of the commodity owners.

Considerable resistance to the notion that Marx’s theory does not require commodity money continues to persist. Claus Germer is a vocal proponent of the view that money must be a commodity in Marx’s framework given the logic of that theoretical framework (2005: 21). Germer’s primary objection to the designation of circulating paper as money is the concern with which we began, specifically that paper cannot serve as a measure of value since it is not a commodity with a value of its own (Germer, 2005: 33). Nelson (2005: 66, 76) also argues that even though Marx overstated his case, Marx insists that money must be a commodity to serve as a measure of value. It has been argued, however, that to serve as a measure of value, an object need not be a commodity or even possess value as long as it reflects value. In 1910, Rudolf Hilferding proposed precisely this solution to the problem of inconvertible paper money when he claimed that, in an inconvertible fiat money system, “the value of paper money . . . is completely independent of the value of gold and reflects directly the value of commodities” (Hilferding, 1981: 39). With a very appropriate analogy reminiscent of Marx’s own style, Hilferding explains how this reflection is possible.

Just as the moon, long since extinguished, is able to shine only because it receives light from the blazing sun, so paper has a value only because commodities are impregnated with value by social labour. It is therefore a reflection of labour
value which converts paper into money just as it is reflected sunlight which enables the moon to shine. (1981: 40)

This theory of inconvertible paper money never gained widespread acceptance among Marxists. Lenin, for example, charged Hilferding with committing a “mistake” in the theory of money despite his contributions to our understanding of imperialism (1939: 15). Marx was not silent on the issue of inconvertible paper money, however, and his treatment of it within the context of simple commodity circulation shares some key similarities with the analysis presented here.

The presentation of the exchange-value of a commodity as an independent entity is here only a transient aspect of the process. The commodity is immediately replaced again by another commodity. Hence in this process which continually makes money pass from hand to hand, it only needs to lead a symbolic existence. Its functional existence so to speak absorbs its material existence. Since it is a transients objectified reflection of the prices of commodities, it serves only as a symbol of itself, and can therefore be replaced by another symbol. (Marx, 1976: 226; italics added)

Marx’s discussion of the gradual debasement of the precious metals in circulation also suggests the diminished importance of the substance of money. Specifically, when considering the ability of degraded metallic money to continue to serve as a measure of value despite its debased character, Marx pointed out that money appears fleetingly between the two commodities and so its material substance is unimportant (Lapavitsas, 2000: 636). It is not being argued that the theory of money presented here may be entirely found within Marx’s written work on the subject. It is being argued, however, that Marx leaves a clear path to follow in any effort to extend the Marxian theory of value to monetary systems in which paper has completely displaced the money commodity.

This extension of Marx’s theory of money only directly addresses the first of Moseley’s pressing problems for Marxian theory listed above. It offers a means of
reconciling the existence of inconvertible money with the Marxian theory of value. It also carries implications for the causal relationship between the quantity of paper money and commodity values but these implications require elaboration. Although an investigation of this issue is beyond the scope of this paper, a few remarks can be made at this stage. First, it is well known that Marx believed that the quantity of money would adjust to ensure the realization of commodity values and thus his theory of money directly contradicts the quantity theory of money. Duncan Foley, for example, in his preface to Suzanne de Brunhoff’s *Marx on Money*, supports de Brunhoff’s conclusion that it is the quantity of circulating money in Marx’s view that adjusts to satisfy the quantity equation, “a sharp reversal” of the claim that the quantity of money determines prices (1973: vi). This reversal is the natural implication of Marx’s money form of value. If commodities exchange in proportion to the labor time required for their production, then the quantity of gold must adjust to make the realization of commodity values possible. In Marx’s theory, the quantity of money in circulation would adjust to the sum of prices (i.e., to the requirements of circulation) by hoarding and dishoarding and/or by a change in money velocity (Moseley, 2005(1): 4). Given a circulating money commodity, it is only in this fashion that commodity values are capable of being exactly realized.

In the case of inconvertible money, the situation is somewhat different. In that case, the circulating quantity of state fiat money “retains an arbitrary element” to the extent that the state can manipulate it (Fine et al., 2004: 9). As a result, a constant commodity value may not continue to be expressed in the same price as is the case when gold circulates. The regulatory function of hoards fails to operate in the case of inconvertible paper money so as to maintain constant paper money expressions of value.
In Likitkijsomboon’s (2005: 163-164) critique of Marx’s anti-quantity theory of money, he argues that Marx does not provide an analysis of the causal link between an increase in the paper money supply and higher paper money prices and thus what renders the hoarding mechanism ineffective in the case of inconvertible paper money. The reason, however, is that the state cannot guarantee the preservation of the value of money and so hoarding cannot serve the same function (Lapavitsas, 2000: 646). When commodities enter circulation, however, they continue to enter with given values. Their paper prices, however, depend on the total quantity of circulating paper. Both of these assertions are represented in equation (4). As long as commodity values are regularly and routinely realized through simple commodity circulation, the magnitude of each paper money price does not matter in the slightest. Instead, the only characteristic of paper money prices that is of any consequence is the fraction of the total circulating paper money supply that each represents. This condition makes the routine realization of commodity values possible and sharply distinguishes Marx’s money form of value from the fiat money form of value. The quantity of money in the case of inconvertible paper money can, therefore, affect paper money prices but not commodity values.

A great deal of attention has been appropriately paid to the NI’s definition of the value of money in recent years. Although the absence of an explanation for the value of money is a definite shortcoming of the NI, it may also be interpreted as a symbol of its flexibility. As a result, the NI’s definition of the value of money may be both criticized and admired. Fine et al. (2004: 10), for example, argue that the NI’s separation of definition from determination is “completely arbitrary” rendering its analytical power in this respect, negligible. At the same time, Foley is able to maintain that the NI’s
definition of the monetary expression of labor time (MELT) does not commit it to any
particular theory about the determination of the MELT (Foley, 2000: 22). It is equally
consistent with commodity money and fiat money.

As is shown below, the NI’s definition of the value of money as “the ratio of
aggregate direct labor to aggregate value added” (1982: 41) is consistent with the fiat
money form of value developed above. Foley (1982) advocates beginning at the global
level in our interpretation of the labor theory of value so that the total abstract social labor
expended in commodity production (in the form of the net commodity product) has its
value socially expressed in the form of money, regardless of whether money takes the
form of a commodity (1982: 37). Even if one argues, as Moseley does from the
perspective of his “macro-monetary interpretation of Marx’s theory (2000: 284), that
Marx approaches the subject of commodity value from this global perspective, Marx
certainly does not have a well-developed theory of the value of pure fiat money and so it
falls to us to make this extension comprehensible.

Nevertheless, this global approach may be adapted so that it is consistent with
Marx’s method. In a much-contemplated passage, Marx describes what he believes is the
correct method of political economy (1973: 100). He criticizes those who choose to
begin with a “chaotic conception of the whole” and uses the population as a starting point
to illustrate his argument. Instead, Marx argues that the political economist should
proceed from the chaotic conception to the “simplest determinations” and then return to
the whole which has now been transformed into a “rich totality of many determinations
and relations” (1973: 100). Similarly, one must proceed from the quantity of circulating
money to the simplest determinations—in this case, the simple moments of simple
commodity circulation. At this level, Marx’s analysis of commodities and money led to his assertion that abstract labor time determines commodity values and prices. One may then proceed to what was initially a chaotic conception of the whole process of simple commodity circulation to discover the quantity of circulating money once again—now explained as the consequence of commodity values.² The analysis of the fiat money form of value, however, presents the quantity of circulating money as the reflection of the sum of commodity values but the method is the same.

Before proceeding to an illustration of the consistency of the NI’s definition of the value of money with the definition of the value of money implied by the fiat money form of value, the latter definition must be defined and distinguished from Foley’s (1982) definition. The definition of the value of money implied by the fiat money form of value is the ratio of aggregate labor (living and dead) to the aggregate gross value product. De Vroey (1981: 190) also defined the value of money (or its inverse, the MELT) in this way. This definition of the value of money follows directly from equation (4) in which \((m)/L^C\) is the monetary expression of labor time (MELT) and its inverse, \(L^C/(m)\), is the value of money.³ This definition addresses Moseley’s concerns about the inconsistent treatment of constant and variable capital in the NI (2000: 284). On the basis of this definition, all socially necessary abstract labor is reflected in the entire mass of circulating money.

² This is precisely Steuart’s achievement: “He does not mechanically place commodities on one side and money on the other, but really deduces its various functions from different moments in commodity exchange” (Marx, 1970: 165).

³ Again, the velocity of money in circulation is assumed to be equal to 1.
A simple example can illustrate the manner in which these two definitions of the value of money are consistent with one another. Table 1 is the three-sector model of simple reproduction that Bortkiewicz first explored within the context of the transformation of values into prices of production (1949: 204). Department I produces means of production, department II produces means of subsistence or wage goods, and department III produces luxury goods.

**TABLE 1: VALUE CALCULATION ($)**

Assume that all values in Table 1 are in terms of paper dollars. Assuming that the total quantity of living labor performed \((L_v + L_s)\) is known to be 1,231 hours, the value of money as defined by Foley can be easily calculated to arrive at 2.46 labor hours per dollar \(= 1,231 \text{ hours}/\$500\). The value of money derived through an analysis of the fiat money form of value can also be calculated because the aggregate labor embodied in the gross commodity product is immediately implied on the basis of the information given. To understand the reason, it is only necessary to recall that each paper price is a fractional reflection of the aggregate value of commodities in circulation as shown in equation (5).

\[
\frac{L_v + L_s}{L_c + L_v + L_s} = \frac{S + V}{C + V + S} \Rightarrow L_c + L_v + L_s = 2,154 \text{ hours}
\]  

(5)

The value of money that the fiat money form of value suggests must also be 2.46 labor hours per dollar \(= 2,154 \text{ hours}/\$875\). Since each price is a fractional reflection of the aggregate value of commodities in circulation, it is easy to identify the quantities of labor reflected by each price represented in Table 1. Table 2 lists the quantities of socially necessary abstract labor time (SNALT) reflected in the dollar values presented in Table 1.
TABLE 2: VALUE CALCULATION (SNALT)

It is certainly not a coincidence that the value of money calculated according to Foley’s definition is equal to the value of money calculated according to the definition that the fiat money form of value implies. It must be the case as statement (6) expresses clearly.

\[
\frac{L_V + L_S}{V + S} = \frac{L_C + L_V + L_S}{C + V + S} \iff \frac{L_V + L_S}{L_C + L_V + L_S} = \frac{S + V}{C + V + S}
\]  \hfill (6)

This statement of logical equivalence implies the logical consistency of the two definitions of the value of money. The key difference is that the definition implied by the fiat money form of value also provides an explanation for the determination of these prices that is consistent with the Marxian theory of value. In the example, the labor values were inferred from the paper money prices, but theoretically the commodity values exist prior to circulation, albeit in latent form.

Despite the differences in the two definitions of the value of money, Foley’s discussion of individual commodity values sounds surprisingly consistent with the fiat money form of value developed above.

Any particular commodity can be seen as embodying a certain fraction of the total abstract social labor expended in producing commodities; it also exchanges for a certain amount of money (its price), which represents possibly a different fraction of the aggregate abstract social labor expended. This theory thus inherently permits the possibility of a deviation of the price of a commodity from its labor value, that is, the fraction of the aggregate abstract social labor embodied in the commodity (Foley, 1982: 37-38; italics added).

In this fashion, a commodity’s price may deviate from its (reflected) value even in the case of pure fiat money where such a statement is more difficult to comprehend at first than in the case of commodity money. Foley argues that the labor theory of value
interpreted in this way is consistent with any theory of price (1982: 38). While technically true, we should not minimize the regulating influence of the law of value or we risk reducing the labor theory of value to a meaningless definition.

Tables 1 and 2 can be used to illustrate how it is possible for a commodity value to deviate from its price in the context of a pure fiat money system. Once the labor values of the commodities are known, the quantities of paper that reflect those values are fixed as long as the paper value of the total product remains unchanged. Ignoring the consequences of such a change for simple reproduction, a $25 reallocation of spending from department I to department II would cause the paper price of department I’s total product to fall from $375 to $350 (below its value). Similarly, the paper price of department II’s total product would rise to $325 (above its value). Over time, these price/value discrepancies might lead to a reallocation of labor power and means of production from department I to department II until the commodity values once again coincide with prices. In Foley’s view, however, abstract, socially necessary labor and its expression in money form in exchange emerge simultaneously and thus it is impossible to identify one or the other pole as the ultimate determining factor (2005: 39). Patrick Murray has also emphasized that demand plays a role in the constitution of value in that the social validation of labor as socially necessary abstract labor occurs only in circulation (2005: 59). As a result, the paper value of a commodity may change even before any reallocation of productive capital occurs if the deviation of price from value persists for a significant period of time. Even theoretically then, it may be impossible to identify the precise moment when a deviation of price from value transforms itself into a
change in commodity value. This point is extremely important for developing a radical reinterpretation of the transformation problem discussed in the next section.

Before proceeding to an analysis of the transformation problem, the special treatment of constant capital should be considered. Fred Moseley has pointed out that it is possible to transform constant capital into labor time equivalents using the definition of the MELT provided by the NI (Foley, 2000: 24), which is precisely the approach that has been taken to transform the monetary values of Table 1 into the labor time equivalents in Table 2. Foley warns, however, that there seems to be “no plausible interpretation of the labor time equivalent of the constant capital or invested 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)” (Foley, 2000: 24-25). To understand why this relationship fails to hold in the three-department model represented in Table 1, it is helpful to attempt a conversion of the constant capital requirements in each department into the quantities of labor required for their production. For example, the socially necessary labor time reflected by the constant capital employed in department k is reasonably defined as in equation (7).

$$\frac{c_k}{C} (LL_1) + \frac{c_k}{C} (LL_2) + \frac{c_k}{C} C_2 (LL_3) + \ldots = \frac{c_k}{C} (LL_1)(1 + \frac{c_1}{C} + \frac{c_1^2}{C^2} + \ldots) = \frac{c_k (LL_1)}{C - c_1} \quad (7)$$

In equation (7), $c_k$ represents the constant capital employed in department k, C represents the total constant capital employed, and $LL_1$ represents the living labor employed in department I, which again produces means of production. The aggregate labor time reflected by the aggregate constant capital employed across all departments is given in equation (8).
Regardless of the quantity of living labor chosen in Table 2, it is generally not possible to transform the paper prices in Table 1 into labor values in Table 2 such that the labor embodied in the elements of constant capital make sense. That is, at best either the paper prices in Table 1 serve as fractional reflections of the aggregate labor value or the labor values that each department’s constant capital reflects are determined as in equation (7). Both conditions cannot simultaneously hold.

An application of the NI definition of the value of money to the constant capital in this example appears entirely arbitrary. In defense of the NI, Foley raises no objections to using the MELT to derive the labor time equivalents of constant capital (Foley, 2000: 25). Fine et al. (2004), however, take issue with Foley’s claim that the constant capital can be transformed using the NI’s definition of the value of money. They state that there is “no logical or economic reason for treating labors expended at different periods in the past, in the several vintages of constant capital that have passed into the value of the current output, as immediate, directly, and generally equivalent with each other, as well as with labor expended in the current period, via division by the ratio of the flow of living labor to the price of current net output” (Fine et al., 2004: 14). The logical reason, however, is developed above as the fiat money form of value. Therefore, not only is Foley correct to raise no objections to the application of the MELT to constant capital, good reason exists for such an application.

Part of the objection that Fine et al. raise arises from their assertion that the valuation of capital undergoes significant change throughout the course of capitalist development. They argue, for example, that the “forcible and violent changes of
valuation of capital” are not accounted for when using the NI’s definition of the value of money to transform constant capital into quantities of dead labor that can be added to current living labor expended (Fine et al., 2004: 14). On the contrary, the fact that the current dead labor quantities are not clearly related to past dead labor implies that the dead labor embodied in the means of production is constantly updated as a consequence of moral depreciation and other factors. The application of the fiat money form of value provides a plausible interpretation of how these changes occur. If all labor is reflected in the total mass of circulating money, then given the living labor, total value added, and total gross value, the total labor is readily determined. Hence, the labor embodied in the means of production becomes determinate. Of course, the market is responsible for this particular valuation of the means of production and the socially necessary labor time reflected in it. The application of the MELT to the constant capital in each department only reveals the precise consequence of this market valuation. Such an application thus loses its arbitrary character.

3. **Incorporating Value-Form into the Transformation Problem Debate**

Both of the originators of the NI, Duncan Foley and Gerard Dumenil, acknowledge that their interpretation of the labor theory of value does not provide a solution to the transformation problem (Fine et al., 2004: 6). Again, this absence of a solution may be perceived as a weakness to its critics and as an advantage to those who wish to use parts of the NI to construct a radical solution to that problem. It is possible to present one such radical reconstruction of the transformation of values into prices of production that is, at once, both highly accessible and consistent with the fiat money form of value developed above.
The proposed reconstruction of the transformation process requires that the flexibility of the NI be abandoned. Fine et al. (2004: 6), for example, point out that the NI lacks a solution to the transformation problem or putting the matter differently, it is compatible with any pricing solution. One must argue in favor of a particular pricing solution so as to create a unique solution to the problem. The main condition for a unique solution to the problem is that all values must be subject equally to the transformation so that no arbitrary restrictions are placed on the flow of capital between branches of production. Hence, the quantity of variable capital in each department cannot be assumed to be invariant in the transformation as in the NI to obtain the desired invariance conditions as the NI defines them. Itoh (2005: 179-180) presents a simple two-department model of this approach that allegedly solves the transformation problem “in Marx’s spirit.” Allowing all branches of production to be equally subject to the transformation process, far from leading to contradictions, serves as the basis for the radical reconstruction proposed below.

Marxist economists simply must come to terms with the legitimacy of the dual system approach to the transformation problem as Bortkiewicz (1949) originally formulated it. According to Foley, the dual system interpretation of the labor theory of value fails on two counts in that it ignores money and does not lead to a progressive research program (Foley, 2000: 18). Although the dual system interpretation as it was originally formulated is lacking in its treatment of money, it has an important contribution to make to a satisfactory solution to the transformation problem because the basic validity of that approach is sound.
Fred Moseley (2000) has presented an interesting argument in an effort to defend Marx’s transformation procedure from the charge of logical inconsistency while at the same time pointing out difficulties with the NI. His argument rests on the notion that Marx treats constant capital and variable capital in their monetary forms as *given* values, which may or may not be proportional to the quantities of labor embodied in the means of production and wage goods (Moseley, 2000: 297). Hence, when Marx transforms values into prices, no transformation of the monetary forms of the constant and variable capital is necessary. Regardless of whether the textual evidence supports this reading of *Capital*, my main objection to this method of proceeding is that it cannot work in a simple model with simple reproduction like the one found in Bortkiewicz’s (1949) essay. Marx’s transformation procedure disrupts simple reproduction in this case. It certainly cannot be argued that Marx would also object to such a model given the two-department model presented in Volume 2. One would have to argue that a model of simple reproduction is appropriate for an analysis of the reproduction of the total social capital but not for the analysis of the formation of an average rate of profit. This defense does not seem reasonable. Alternatively, one could link together the theory of capitalist crises with the transformation of values into prices of production and argue that capitalist competition inevitably leads to an economic crisis of disproportionality. The problem here is that it is difficult to argue that a uniform rate of profit could ever be approached in a capitalist economy that is continuously plagued by crises with every effort to establish it.

At the same time, Fred Moseley (2005(2)) has argued persuasively that Bortkiewicz and Sweezy, as representatives of the traditional dual system interpretation, have faltered in their analysis of the transformation of values into prices of production
with respect to their treatment of the gold-producing department. Specifically, Moseley points out that their rendering of the solution is inconsistent with Marx’s position that the sum of commodity prices determines the quantity of circulating money rather than the reverse. The notion that a relatively low organic composition of capital leads to a transfer of surplus value from the gold sector to other industries suggests the reverse causality because then the sum of production prices exceeds the sum of commodity values (Moseley, 2005(2): 99, 204). This point is important in any formulation that includes a gold-producing sector because it suggests that it is necessary to maintain Marx’s aggregate equality between values and prices of production from the outset, which is an approach that Bortkiewicz abandons at the beginning of his analysis without explanation (1949: 202). Paul Sweezy makes the same decision, opting for the transformation method that is mathematically simpler and thus more attractive (1970: 117). This view is troubling because it suggests that the appropriate method of transformation is whatever method one finds most convenient.

Without entering into the debate between Makoto Itoh (2005: 185) and Moseley (2005(2)) about the role of the gold-producing department in the transformation process, it can be agreed that in a model without a gold-producing sector (e.g., a fiat money system), it is crucial to maintain the equality between the sum of commodity values and prices of production because the total purchasing power does not change but is simply distributed differently by branch of production. That is, the quantity of circulating money should not depend on the competitive process by which an average rate of profit is determined. Hence, the sum of production prices formed as a result of profit rate equalization must remain the same as the sum of commodity values.
Two restrictive assumptions emerged from the above discussion that allow for a unique solution to the transformation problem in a fiat money system. Specifically, it must be assumed that aggregate commodity value (in dollar terms) must equal aggregate production price (in dollar terms) and that capital is unrestricted in its movement towards the highest rate of profit. Given these assumptions, the conditions for a proper transformation of values into production prices can be formulated in the same way that Bortkiewicz (1949: 202) and Sweezy (1970: 117) originally formulated the problem before abandoning it. That is, if ‘x’ represents the ratio of commodity price to value in department I, ‘y’ represents the ratio of commodity price to value in department II, and ‘z’ represents the ratio of commodity price to value in department III, ‘ρ’ represents the general rate of profit, then conditions (9) through (12) must hold.

\[
(1 + \rho)(c_1x + v_1y) = (c_1 + c_2 + c_3)x \tag{9}
\]

\[
(1 + \rho)(c_2x + v_2y) = (v_1 + v_2 + v_3)y \tag{10}
\]

\[
(1 + \rho)(c_3x + v_3y) = (s_1 + s_2 + s_3)z \tag{11}
\]

\[
Cx + Vy + Sz = C + V + S \tag{12}
\]

In the above equations, C, V, and S refer to aggregate paper values and the numbered terms represent the paper values in each department. In the original formulation, Bortkiewicz assumes \(z = 1\) and abandons the condition that total production price equal total value. This decision ultimately causes aggregate surplus value to equal aggregate profit yet total production price exceeds total value.

Because it is assumed that the fiat money form of value applies, however, department III can be treated as a luxury department and need not serve as the gold department. Hence, the four unknowns in the system are x, y, z, and ρ and can be solved
given the four equations. Solving (12) for x, substituting x into (9) through (11), and adding (9) through (11) together allows us to solve for ρ as in (13).

\[ \rho = \frac{S \cdot z}{C + V + S - S \cdot z} \]  

(13)

If z is assumed to equal 1, then ρ equals S/(C+V) and Marx’s invariance conditions hold, but this approach disrupts simple reproduction using the value data given in Table 1, which is a condition considered necessary for a valid solution. Instead the solutions may be calculated (a computer program is the most efficient means for obtaining the results) thereby generating the results as in Table 3 below.

4 Two sets of solutions can actually be calculated but only the set in Table 3 is economically meaningful. The solutions have been rounded.

4

TABLE 3: SOLUTIONS

On the basis of the solutions presented in Table 3, it is possible to transform the paper values from Table 1 into paper prices of production as in Table 4 below.

5 The figures in Table 4 have been rounded to the nearest dollar.

5

TABLE 4: PRODUCTION PRICE CALCULATION ($)

The results in Table 4 indicate that simple reproduction holds and total production price is equal to total commodity value. Aggregate profit, however, is now below aggregate surplus value. As usual, the so-called invariance conditions fail to hold simultaneously. It appears as though we simply swapped Bortkiewicz’s surplus value/profit equality for

---

4 Two sets of solutions can actually be calculated but only the set in Table 3 is economically meaningful. The solutions have been rounded.

5 The figures in Table 4 have been rounded to the nearest dollar.
the aggregate value/aggregate price equality and emerged no better off than previously.

Is it reasonable to evaluate these results in any other way?

We can begin to approach this question with a consideration of the value of money and its basic determinants. Clearly, the total circulating paper money supply has not changed given the condition that aggregate value and aggregate production price are equal. In addition, the aggregate socially necessary abstract labor performed throughout society has not changed nor is there any immediate reason to expect that the free flow of capital should affect the sum total of labor performed in society. As a result, the aggregate socially necessary labor performed continues to be equal to 2,154 hours. The fact that both the total quantity of circulating money and the aggregate labor performed remain constant implies that the value of money has not changed. This maintenance of a constant value of money before and after the transformation procedure is consistent with both the NI and with Moseley’s interpretation of a commodity money system (Itoh, 2005: 184). The stability of the value of money throughout the competitive process carries great implications for a radical reinterpretation of the results of the transformation procedure.

Table 5 below presents the quantities of socially necessary abstract labor time that each paper production price reflects in circulation. One need only multiply each paper production price by the value of money to obtain the quantity of socially necessary abstract labor time that each reflects. Alternatively, each paper production price may be interpreted as a fractional reflection of the aggregate value of commodities in circulation.

**TABLE 5: PRODUCTION PRICE CALCULATION (SNALT)**
This application of the value of money to determine the quantities of labor required for production appears to indicate a change in labor requirements. This feature of the NI has not gone unnoticed. For example, Mohun points out that the NI is compatible with an infinite number of conceivable transformations with each price system serving as a different redistribution of the labor times (Fine et al., 2004: 6). The key difference, in this example, however, is that a unique price system has been defended on the basis of the unrestricted flow of capital across departments. Subsequently, a unique distribution of socially necessary abstract labor time has also been implied. The next question that arises is, of course, what is the meaning of these newly calculated quantities of labor time?

To begin to understand how these quantities of labor time might be interpreted, it is instructive to reflect on the meaning of socially necessary abstract labor time in Marx’s theory. According to Foley, when Marx introduces the category of socially necessary labor, he does so as a correction to Ricardo’s casual language (2000: 7). Perhaps a great deal more is at stake here with respect to our understanding of the transformation problem. In other words, might this notion also be conceived as a transformation problem in itself, albeit one that is simple mathematically speaking and hence not requiring considerable elaboration of its quantitative aspects?

For example, consider an industry with three producers such that producer A requires 8 hours of total labor time to complete a chair (including both living and dead labor both performed by producer A), producer B requires 10 hours of total labor time to complete a chair, and producer C requires 12 hours of total labor time to complete a chair. 10 hours of labor time are socially necessary on average for the completion of one
chair. Hence, each chair produced represents 10 hours of socially necessary labor time for its production and assuming the normal state of market demand, each will fetch an equivalent value in the market thus transforming the concrete labor embodied in each chair into abstract labor and each use value into a commodity. In this case, producer A receives a value equivalent of 10 hours in exchange even though only 8 hours were worked. Producer A thus receives a price that is higher than would be paid if producer A was paid according to the private concrete labor expended in the production of the chair. At the same time, producer A receives a price that is exactly equal to the chair’s value defined as the amount of abstract labor that is socially necessary on average for its production. The point is that producer A does not actually work for 10 hours even though he/she is paid as if 10 hours are actually worked.

Once we understand commodity value, we need not constantly return to the fact that an individual producer is likely to actually work either more or less than the average in the industry. Marxists generally proceed with Marx through Volume 1 of Capital in analyzing the division of the working day into necessary and surplus labor and do not let this transformation from actual labor time into socially necessary labor time trouble us for a moment. Perhaps because we follow Marx throughout Volumes 1 and 2 and much of Volume 3 of Capital with this understanding of socially necessary labor time, we find it difficult to transform our understanding again when we arrive at his discussion of the formation of an average rate of profit. We wish to cling to Marx’s brilliant analysis of capitalist exploitation and resist transforming our understanding of commodity value yet again. Our ability to advance the state of Marxian theory beyond the realm of
competitive capitalism, however, depends primarily on our ability to accomplish that very thing.\(^6\)

The new question that naturally follows is how should the notion of socially necessary abstract labor time be reinterpreted within the context of capitalist competition. Wolff et al. (1984) provide the answer to this question. They argue that the transformation problem debate is rooted in a failure to properly distinguish between the Ricardian and Marxian analytical frameworks. In their view, the very notion of value is transformed throughout the three volumes of *Capital* at each stage of the analysis. Wolff et al. emphasize that the analysis of circulation was, in Marx’s view, indispensable for the determination of socially necessary magnitudes of labor time (1984: 121). As a result, the labor quantities reflected in the paper money prices in Tables 4 and 5 represent new or modified forms of value. Socially necessary labor time now refers to labor that is deemed socially necessary to reproduce capitalist commodities within the context of capitalist competition.

Perhaps it should be clarified that with respect to the transformation of values into prices of production, it is the process of capitalist competition which modifies our understanding of the concept of commodity value. It is in Volume 2 that Marx deepens our understanding of value in his analysis of the process of circulation of capital whereas in Volume 3 he treats the capitalist class process as a whole. Wolff et al.’s emphasis on the role of circulation in the constitution of commodity value (newly understood) may

\(^6\)Christopher Arthur (2005: 121) has also pointed out the need to recalculate socially necessary abstract labor time within the context of *intra*-branch competition as well as within the context of *inter*-branch competition.
have contributed to their problematic belief that the circulation process as understood in Volume 3 has no bearing on the living labor component of commodity value. They thus exempt this characteristic of the capitalist production process from the process of transforming values into prices of production (Wolff et al., 1984: 126). They may also fall into this line of reasoning because it is difficult to abandon the earlier value categories. No logical problem arises from arguing that more or less socially necessary living labor is performed after the transformation procedure. Their basic point is entirely accurate, however, and is reflected in their definition of production price as the “magnitude of labor-time just exactly large enough (socially necessary) to reproduce the capitals of each industry on an equal profit footing with those in all other industries” (Wolff et al., 1984: 125). The concept of value is thus transformed and in this way both of Marx’s aggregate equalities hold as identities (Wolff et al., 1984: 128). In particular, profit and surplus value (reconceived) are now equal.

Should this new way of comprehending the law of value trouble us because it is not “really” the labor time that regulates the rate at which commodities exchange for one another? On the other hand, should we defend it on the grounds that it is the best approximation to reality that political economy has to offer? It is exactly this false empiricism that Engels slips into in an effort to combat the criticisms of Conrad Schmidt. Louis Althusser’s defense of the law of value against both Schmidt and Engels can be applied to the solution formulated here so as to address this concern.

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7 See Howard and King (1989: 48) for a discussion of the private correspondence between Engels and Schmidt on this matter.
For Marx the concept of the law of value is in fact a concept perfectly adequate to its object, since it is the concept of the limits of its variation, and therefore the adequate concept of the field of its inadequacy – and in no sense an inadequate concept by virtue of some original sin which affects all concepts brought into the world by human abstraction. Engels therefore transfers to an empiricist theory of knowledge, as a native weakness of the concept, precisely what constitutes the theoretical strength of Marx’s adequate concept! (Althusser, 1997: 82)

Ironically, Conrad Schmidt is another theorist who much earlier proposed that the definition of socially necessary labor would play a key role in the transformation procedure, but he errs with his argument that the labor required to produce the surplus product is not socially necessary labor (see Howard and King, 1989: 26). In any case, it is the erroneous belief that aggregate profit must equal aggregate surplus value (as originally defined) that has created the transformation problem. It is inconsistent with Marx’s method to assert that the appearance of social reality must correspond to its essence. It is the empiricist drive for accurate measurement that will foster resistance to solutions such as the one proposed here.

The transformation does not imply that the previously defined system ceases to exist. That is, we do not lose the insights of that system when we transform it into a new system, nor are workers any less exploited because the surplus labor appears to have fallen in the course of the transformation. David Laibman’s point that labor value exists in conjunction with profit rate equalization is very instructive here (2002: 167). Instead of replacing one system with another, the two systems coexist. This solution thus reinforces the fundamental claim that profit arises from the appropriation of surplus labor.

The key conclusion is that profit corresponds to surplus labor. It does not equal surplus value as originally defined, but it does represent socially necessary surplus labor,
which is the important thing. According to Foley, his interpretation allows us to sustain what is arguably Marx’s central claim in Volume 3 that profit arises from unpaid labor (1982: 42). It should be clarified that Foley’s interpretation also allows us to sustain the claim that profit arises from unpaid labor as *originally interpreted* prior to the analysis of capitalist competition. That is, we can maintain that profit equals surplus value, but all we really need to show is that profit represents socially necessary surplus labor. It is Foley’s attempt to maintain Marx’s alleged invariance conditions, even if only in modified form, that interferes with the more important goal of demonstrating that profit represents socially necessary surplus labor.

This proposed solution also allows us to address Bohm-Bawerk’s claim that Volumes 1 and 3 of *Capital* stand in direct contradiction to one another in that Marx abandons the law of value to explain the equalization of profit rates (1949: 30). He explains that, “his solution is obtained at the cost of the assumption from which Marx has hitherto started, *that commodities exchange according to their values*. This assumption Marx now simply drops” (Bohm-Bawerk, 1949: 21; italics in original). Has Marx in fact entered into a contradiction? Do commodities exchange according to the quantity of socially necessary abstract labor time embodied in them after the transformation from values into prices of production? Based on the foregoing analysis, the answer to the latter question is clearly yes. It is that claim that was made in Volume 1 and continues to hold throughout Volume 3. The only difference is that our understanding of what constitutes socially necessary abstract labor time has deepened.

The transformation problem is not a mathematical problem or even a theoretical problem. It is a problem that we have generally in adjusting to Marxist philosophy. The
problem is a problem of transforming our thinking such that we continue to see exploitation in newly modified forms of appearance. Stating that the amount of surplus labor has fallen from 492 hours to 431 hours in this example does not change the amount that workers are actually working. Exploitation is two-sided, however, and the capitalists now only receive profit payments suggesting that 431 hours of surplus labor have been performed. We have merely moved closer to the appearance of things and now have the power to trace it to its roots. Workers are not treated any differently as a result of this redistribution and reinterpretation of the payments, but the form of appearance has changed.

4. Conclusion

The NI, though insightful, has failed to convince because it does not directly address the challenges that Bortkiewicz and Bohm-Bawerk pose to Marxian value theory. By introducing the fiat money form of value and through a unification of the dual system and single system interpretations of the transformation problem, however, the insights of the NI can be used to directly address those longstanding criticisms of Marxian value theory. The main contribution of the NI is that it provides a method of incorporating money into the analysis in a coherent manner.

The advantages of this unified approach are considerable. It addresses Moseley’s concern about the NI’s failure to treat constant and variable capital consistently in the transformation (2000: 309). It also defines the key variables in terms of money and gives methodological priority to the prior determination of aggregate magnitudes as Foley does (Moseley, 2000: 306). On the other hand, it denies Moseley’s claim that the monetary values of constant and variable capital should be treated as given and thus not subject to
the transformation procedure. In this way, it tackles the challenges that Bortkiewicz poses and resolves them through a reinterpretation of socially necessary labor time. Foley (2000: 32) admits that Wolff et al.’s solution is consistent with the NI as long as it defines the MELT in the same way as the NI so it is not problematic to merge the one with the other.

The value of labor-power has also been transformed into the production price of labor-power. It appears as though the value of labor-power exceeds the production price of labor-power. Because the value of labor-power refers to the socially necessary labor time required to reproduce labor-power as a commodity, however, its price and value continue to be equal just as profit continues to equal surplus value (newly defined).

Foley’s definition of the value of labor-power as the money wage multiplied by the value of money is perfectly consistent with both the value and price systems presented. Furthermore, Foley’s definition of the value of labor power as the money wage multiplied by the value of money is perfectly consistent with the notion that a given level of workers’ means of subsistence regulates the value of labor power (Foley, 1982: 42).

Even though the total wages paid fell from $300 to $280 during the course of the transformation, the price of wage goods fell equally. Therefore, workers are able to purchase the same quantity of wage goods in either case. Similarly, although profits are lower than the original surplus value, the total production price of luxury goods is also below its original monetary value. As a result, capitalists appropriate the same surplus product regardless of whether competition among capitals is being considered.

The proposed solution raises some terminological difficulties because when reference is made to ‘surplus value’ or the ‘value of labor-power,’ for example, it must be
specified whether this magnitude is defined within the context of capitalist competition. As a result, it is best to adhere to the term “value” within the context of pre-transformation capitalism and reserve the term “production price” for post-transformation capitalism. To argue then that surplus value and profit are unequal is only a matter of choice of language. The important point, again, is that profit represents socially necessary surplus labor. The claim that commodities exchange in proportion to their production prices then in no way contradicts the law of value (or should we say “law of production price?”).

The foundation of this proposed solution to the transformation problem is, of course, the fiat money form of value. Its analysis is both simple and difficult. The deepening of capitalism during the transition from a commodity money system to a fiat money system has led to a contradictory result. The basis of commodity value has become even murkier to the casual observer of economic appearances because commodity value no longer finds its expression in a universal equivalent that is itself the physical product of significant human labor. At the same time, the origin of commodity value has become even more transparent to the serious critic of capitalism because commodity exchange has become so entrenched that the labor embodied in commodities at opposite ends of a commodity circuit is equated without the mediation of a thing possessing value itself, but instead a thing that only reflects value. It is only by means of reflection that it is possible to discern the reflective power of inconvertible paper money. Hegel was the first to identify this double meaning of the term ‘reflection.’

The word ‘reflection’ is originally applied, when a ray of light in a straight line impinging on the surface of a mirror is thrown back from it. In this phenomenon we have two things—first an immediate fact which is, and secondly the deputed, derivated, or transmitted phase of the same. Something of this sort takes place
when we reflect, or think upon an object; for here we want to know the object, not
in its immediacy, but as derivative or mediated by, or based upon, something else.
The immediate Being of things is thus conceived under the image of a rind or
curtain behind which the Essence lies hidden. (Hegel, 1975: 163)

As a result of this new understanding, it can be concluded that this fiat money is no such
thing. It is not money because the state declares that it is such by fiat. This form of value
is so named because that is its form of appearance. Of course, the value that it reflects
and the source of its monopoly position as a measure of reflected value are derived from
its relationship to the total mass of commodity values in circulation. Regardless of
whether this interpretation of the labor theory of value is present in Capital, it is
consistent with the spirit of that work insofar as it seeks to expose the exploitative
character of capitalist reality through an examination of its contemporary appearances.
REFERENCES


### TABLE 1: VALUE CALCULATION ($)

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### TABLE 2: VALUE CALCULATION (SNALT)

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<td>739</td>
</tr>
<tr>
<td>III</td>
<td>123</td>
<td>222</td>
<td>148</td>
<td>492</td>
</tr>
<tr>
<td>Total</td>
<td>923</td>
<td>739</td>
<td>492</td>
<td>2154</td>
</tr>
</tbody>
</table>

### TABLE 3: SOLUTIONS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>1.1199</td>
</tr>
<tr>
<td>y</td>
<td>0.9333</td>
</tr>
<tr>
<td>z</td>
<td>0.8751</td>
</tr>
<tr>
<td>ρ</td>
<td>0.24998</td>
</tr>
</tbody>
</table>
### TABLE 4: PRODUCTION PRICE CALCULATION ($)

<table>
<thead>
<tr>
<th>Department</th>
<th>( P_c )</th>
<th>( P_v )</th>
<th>Profit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>252</td>
<td>84</td>
<td>84</td>
<td>420</td>
</tr>
<tr>
<td>II</td>
<td>112</td>
<td>112</td>
<td>56</td>
<td>280</td>
</tr>
<tr>
<td>III</td>
<td>56</td>
<td>84</td>
<td>35</td>
<td>175</td>
</tr>
<tr>
<td>Total</td>
<td>420</td>
<td>280</td>
<td>175</td>
<td>875</td>
</tr>
</tbody>
</table>

### TABLE 5: PRODUCTION PRICE CALCULATION (SNALT)

<table>
<thead>
<tr>
<th>Department</th>
<th>( L_{Pc} )</th>
<th>( L_{Pv} )</th>
<th>( L_{\text{profit}} )</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>620</td>
<td>207</td>
<td>207</td>
<td>1034</td>
</tr>
<tr>
<td>II</td>
<td>276</td>
<td>276</td>
<td>138</td>
<td>689</td>
</tr>
<tr>
<td>III</td>
<td>138</td>
<td>207</td>
<td>86</td>
<td>431</td>
</tr>
<tr>
<td>Total</td>
<td>1034</td>
<td>689</td>
<td>431</td>
<td>2154</td>
</tr>
</tbody>
</table>