TOTALITY, TAUTOLOGY, AND TRANSFORMATION: PERSPECTIVES ON THE

MARXIAN "TRANSFORMATION PROBLEM"[1]

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Fred Moseley's (FM's) *Money and Totality* (hereafter, *M&T*) is a significant work of Marxist scholarship, but not, I maintain, for the reasons it primarily intends. While this work offers a stimulating and extensively developed perspective for addressing long-standing issues in Marxian economics, I argue that it cannot coherently be understood to refute the well-known inconsistency critique of Marx's analysis of the "transformation" of values into prices in the third volume of *Capital* (Marx 1991, hereafter cited as *C* III[2]).

The argument here will be developed in the following steps.[3] In section 1, I argue that FM's "Macro-Monetary" approach is most accurately understood as a substantial *revision* of Marx's theoretical account, rather than a mere *interpretation* of it, as FM suggests. In the second section, I raise several concerns regarding the explanatory content of FM's approach. In section 3, I deconstruct FM's "algebraic summary" of his macro-monetary system from Chapter 2 of *M&T* to show why it cannot be understood to demonstrate the quantitative claims that FM asserts. Section 4 discusses recent economic literature on Marxian value theory, not addressed in FM's text, that suggests an analytically coherent alternative to the "transformation" approach. The final section closes with some remarks concerning the key contributions of FM's work.

1. Marx's definitions of theoretical terms and their implications

FM represents his "macro-monetary" approach as an "interpretation" of Marx's theoretical account in the four drafts of *Capital*. A significant aspect of FM's account involves specifications of key terms such as *value price* and *surplus value* that appear to differ fundamentally from Marx's own formulations in volumes I and III of *Capital*. I discuss the bases for this assessment below. To the

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[2] Similarly, the first two volumes of *Capital* (Marx 1976, 1992) will be cited respectively as *C* I and *C* II. Passages from Marx's 1861-63 economic manuscript printed in *Marx-Engels Collected Works* (1988, 1989a, 1989b, 1991, 1994) will be cited as *MECW* plus the relevant volume number.

[3] Some of the points discussed here are advanced in more skeletal form in Skillman (2018).

extent that this assessment is correct, FM's approach represents a fundamental *revision* of Marx's account, rather than a mere "interpretation."

1.1. *Commodity value-prices*

FM defines the *value-price* of commodities as "the price form of appearance of value in units of money…" (29-30). Putting aside for a moment what determines the *value* of a commodity, I note here that this is not Marx's definition of the term. In the third volume of *Capital*, Marx explicitly expresses *value-price* as the monetary expression of values in the specific scenario that commodities are assumed to exchange at their respective values (i.e., a scenario in which commodity prices bear a constant proportion to their respective values): "It is…a very different matter whether commodities are sold at their values (i.e., whether they are exchanged with one another in proportion to the value contained in them, at their value prices) or whether they are sold at prices which make their sale yield equal profits on equal amounts of capitals….(*C* III, 275).

FM, however, applies the concept to a case in which commodities do not necessarily exchange at their respective values. The potential issue that arises from this divergence from Marx's conception is that there are claims Marx derives on the explicit premise that commodities exchange at their respective values that do not necessarily follow when they don't. A relevant example here is Marx's demonstration that the rate of surplus value (S/V), in which S and V are determined by value prices and denominated in money, is equal to the ratio of aggregate surplus labor to necessary labor. But if commodity prices are not understood to be proportional to their respective values, as Marx assumes in *Capital* I, then this equality need not obtain in the general case, and would have to be explicitly derived (rather than simply asserted, as in FM's algebraic summary).

1.2. *Commodity values*

If value-price is the "price form of appearance of [commodity] value", then what is the value of a commodity, and how is that value determined? In the first chapter of *Capital* I, Marx argues that the substance of commodity value is labor, and that the magnitude of a commodity's value is "exclusively" determined by the labor time socially necessary to reproduce it (*C* I, 128-9). He later adds that this labor time includes both the new labor directly expended in producing the commodity and the labor embodied in the means of production used up in producing the good.

FM argues, in contrast, that this is only Marx's definition of commodity value for the case of pre-capitalist "simple commodity production"; with respect to commodities produced under the capitalist mode of production, in contrast, FM reads Marx as asserting that the portion of commodity value that is transferred from the means of production corresponds to the *actual* constant capital expended in producing the commodity, determined in equilibrium by the *prices of production* of used-up means of production, and is thus not proportional to the labor time necessary to produce these means of production (30). This formulation implies that, under capitalism, commodity values must be primitively expressed in money terms, and that commodity values may vary without any corresponding alteration in the labor time socially necessary for their production.

The textual basis for FM's reading of Marx on this point is apparently two-fold, deriving from passages in the *Results of the Immediate Process of Production* and in the *Theories of Surplus Value* section of the 1861-63 manuscript that constitutes the second "draft" of *Capital*. However, as FM notes, Marx's discussion in the former text of value transferred from used-up means of production to the commodity is explicitly premised on the assumption of commodity exchange at value, so that the value transferred by used-up means of production is proportional *by assumption*

to the labor embodied in these means. Thus this passage cannot be taken as evidence for FM's interpretation.

The passage from the 1861-63 manuscript, part of Marx's critical response to the writing of Samuel Bailey, could be taken as indicating support for FM's interpretation. However, if read in the context of Marx's subsequent discussions of commodity, both in the 1861-63 manuscript and in the three volumes of *Capital*, this single passage seems like a very thin and unreliable reed from which to hang this fundamental reinterpretation of Marx's notion of commodity value.

First, later in the 1861-63 manuscript, Marx explicitly contradicts FM's interpretation of commodity valuation under the capitalist mode of production:

> The *value of a commodity* is determined the total labor time, *past* and *living*, which enters into it,
>
> Which is contained in it; hence not only by the labor time which is added in the final production
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> process, from which the commodity as such emerges, but by the labor contained in the fixed
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> capital and circulating capital, or in the conditions of production last to be added, by the labor time
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> contained in the machinery, etc., the *matieres instrumentals* and the raw material,..(MECW 33, 136).

Moreover, and perhaps more tellingly, in the three volumes of *Capital*, from the first chapter of *Capital* I to the last substantive chapter of *Capital* III, Marx repeatedly affirms that commodity values are determined solely by the labor time socially necessary for the production, whether or not produced under the capitalist mode of production. (see, for example, *Capital* I, 144-5, 168, 186, 190, 260, 274, 293, 300, 318, 325, 675; *Capital* II (Marx 1978), 123, 462; *Capital* III, 133, 180, 238, 265-66, 272, 283, 780, 783, 998, 1021). In particular, Marx does not alter this stipulation when referring explicitly to commodity values arising specifically under the conditions of *capitalist* production (*Capital* II, 462; *Capital* III, 265, 998). Consequently, the weight of textual evidence would appear to come down decisively against FM's interpretation.

This assessment is not altered by the fact that, beginning in Chapter 7 of *Capital* I, Marx typically refers to value magnitudes in pecuniary terms, as this simply reflects his assumption (motivated at the end of Chapter 5), that commodity prices are *proportional* to their respective values and thus represent them exactly up to a given factor of proportion (*Capital* III, 275). As noted earlier, Marx refers to commodity prices defined in this way as *value prices* (*ibid.*).

Marx explicitly maintains the assumption of price-value proportionality after the fifth chapter of *Capital* I, throughout *Capital* II (as noted at *Capital* III, 263) and his discussion of *cost prices* prior to analyzing the transformation of values into prices (*Capital* III, 203, 252), and in the fragment from the penultimate draft of *Capital* known to Marxian scholarship as "The Results of the Immediate Process of Production" (*Capital* I (Appendix), p. 966). Thus, wherever Marx refers to commodity values in pecuniary terms in these texts, he invariably does so in a context where commodity prices are understood as exact proportional representations of commodity labor values.

1.3. *Commodity prices of production*

FM asserts that Marx's defines *prices of production* not as unit prices, but instead as the "sum of the total annual costs in an industry plus the average annual profit," so that "[a] better name for Marx's prices of production would be 'gross annual industry revenue'" (34). It is true that in the extended passage FM cites from the fragment known to Marxian scholarship as the *Results of the Immediate Process of Production*, Marx refers to price of production both in the sense of a unit price and as an industry aggregate; however, the passage does not specify Marx's basic definition of the term.

I think it's clear from Marx's treatment of the concept in *Capital* III, however, that Marx posits "price of production" as a *unit* price. There are three bases for this assessment. First, when Marx

first introduces the concept of *price of production*, he defines the term with reference to a given commodity, rather than the revenue generated by all the commodities produced in a given industry. Second, Marx later compares his definition to prior definitions from the economic literature, all of which refer to unit prices. Third, Marx uses the term "price of production" in contexts in which FM's "aggregate" interpretation is nonsensical or inappropriate.

On the first point, after introducing the notion of prices of production in the chapter on the "transformation problem" Marx states that "the production price of *a commodity* equals its cost price plus the percentage profit added to it in accordance with the general rate of profit, its cost price plus the average profit" (*C* III, 257; emphasis added; also see *C*.III, 263, 265, 399). Second, in the following chapter, Marx writes that "…what we call price of production is in fact the same thing that Adam Smith calls 'natural price', Ricardo 'price of production' or 'cost of production', and the Physiocrats '*prix necessaire*'" (*C*.III, 300), all of which are notions of *unit* price (see, for example, Smith (1937), 55). Third, Marx often refers to price of production for an individual capitalist, or as the price paid by a consumer for a given commodity, which clearly does not involve the notion of industry aggregates (e.g., *C*.III, 259, 263).

1.4. *Surplus value*

In his algebraic summary in Chapter 2 of *M&T*, FM defines aggregate surplus value **S** as the difference between aggregate *value prices* (which, as noted in point (1.1) above, are not taken individually to be in constant proportion with their respective labor values, unlike in Marx's account) and the sum of aggregate constant and variable capital. Thus, to arrive at aggregate surplus value in FM's system, one must calculate value prices by deriving a multiplier **m** equal to the inverse of the labor value of the money commodity, which is then used to transform aggregate

current-period labor expenditures, with the result then added to aggregate constant-capital expenditures. This is clearly not the case in Marx's formulation, in which aggregate surplus value is understood to be equal to aggregate profit (gross of interest and land rent), based on commodity prices actually obtaining in the capitalist system.

Specifically, in Chapter 4 of *Capital* I, Marx initially expresses the circuit of capital as $M-C-M$, such that the first phase $M-C$ represents a *purchase* of commodities and the second phase $C-M$ represents a *sale* of commodities in exchange for money (*C*.I, 248). Noting that this circuit can only make economic sense if the initial and final *M* differ quantitatively, Marx rewrites the circuit of capital as $M-C-M'$, and on this basis, defines *surplus value* (**S**) as the increment ($\Delta M = M'$ minus M), subject to the caveat that this increment is the result of the value embodied in the initial monetary outlay *M* "valorizes itself" (*verwertet sich*) (*C*.I, 251-2).

In the following chapter, Marx specifies that the "self-valorization" of the value embodied in *M* entails that (1) the increment ΔM must correspond to the production of new value rather than the mere redistribution of values in circulation at the initial outlay of *M* (*C*.I, 265), and cannot reflect labor expended by capitalists supplying that initial outlay (*C*.I, 266). To reflect these conditions, Marx expands the expression of the circuit of capital in Volume II of *Capital* to $M-C...P...C'-M'$ where "…*P*…" denotes a process of production occurring outside of the exchange process, yielding a mass of commodities C' of greater aggregate value than the commodities *C* purchased by the initial outlay of *M* (*C*.II, 110). This is the form of the circuit of capital cited by FM (27).

Similarly, Marx defines *constant* and *variable capital* in pecuniary terms without stipulating any necessary quantitative relation to the values of commodities purchased with these forms of capital. Thus, he defines *constant capital* (**C**) as "that part of capital which is turned into means

of production, i.e. the raw material, the auxiliary material and the instruments of labor, [that] does not undergo any quantitative alteration of its value in the process of production," and *variable capital* (**V**) as "that part of capital which is turned into labor-power [and thus] does undergo an alteration of value in the process of production" (*C*.I, 317). These transformations of money into commodities correspond to actual purchases in respective markets for material commodities and labor power (*C*.II, 110).

Therefore, by Marx's definitions, $M = \mathbf{C} + \mathbf{V}$, where the division of the initial monetary outlay *M* into constant and variable capital is dictated by productive input requirements and the respective prices of means of production and labor power, $M' = \mathbf{C} + \mathbf{V} + \mathbf{S}$, and the increment $\Delta M = M' - M = \mathbf{S}$ reflects the differential between the initial purchases of means of production and labor power and the subsequent sales of commodities newly produced using these inputs.

These definitions have two immediate corollaries pertaining to FM's analysis in *M&T*. First, no *quantitative* connection between surplus value and commodity values (whether expressed in money or in labor time) is implied by Marx's definition of surplus value, contrary to expressions (1) and (4) in FM's algebraic summary, which stipulates, at minimum, that the determination of aggregate surplus value depends on the labor value of the money commodity. While Marx clearly analyzes the determination of **C, V**, and **S** in *Capital* I on the basis of the specific theoretical scenario in which all commodities exchange at their respective values, he never asserts that this condition is part of the *definitions* of these terms.

This assessment is corroborated by Marx's stipulation in *Capital* III of the quantitative equivalence of *surplus value* and *profit*, regardless of whether commodities are understood to exchange at their respective values. Marx repeatedly states that in the aggregate, profit and surplus value are the same thing; profit is simply the "mystified" form of surplus value, in which it is seen

as emerging from some magical property of capital rather than from the exploitation of labor (*C* III, 127, 139, 242). Note in this connection that when Marx refers to the equality of aggregate profit and aggregate surplus value in the course of his "transformation" analysis, he does not treat this as an *inference* from his transformation procedure, but rather as a stipulation made *prior* to his transformation analysis (*C* III, 267), while in FM's system this equality is treated as an *inference*.

Second, since, by Marx's definition, surplus value presumes the sale of commodities produced using the inputs purchased by *M*, and since these commodities must be sold at given market prices, the *production* of surplus value is necessarily simultaneous with its *distribution*. To assert otherwise entails either changing Marx's explicit definition of surplus value in *Capital* I or else making the absurd assumption that commodities are first sold at their value-prices in some capitalist nether-world before being sold at their actual prices (in competitive equilibrium, at their prices of production) in actual capitalist markets.

The presumption that the *production* of surplus value might precede its *distribution* is, admittedly, suggested by Marx's accounts of surplus value in the first two drafts of *Capital* (the *Grundrisse* and the Economic Manuscript of 1861-63). However, the perception that production of surplus value might coherently be understood as preceding its distribution might be driven by the fact that, in this draft, Marx typically treated *surplus labor* and *surplus value* as though they were *identical* (see, for example, MECW *30*, 88, 176, 178, 192, 242, 320, 328; *MECW 31*, 71, 274, 539; *MECW 32*, 68, 469, 543). No such identity can be presumed in Marx's *Capital* I account, however. There, Marx specifies that surplus value, unlike surplus labor, is denominated in money units, and that it emerges from the completed circuit of capital, involving the *sale* of newly produced commodities at given prices.

1.5. The "transformation" problem revisited

In Marx's representation of the "transformation of values into prices of production" in chapter 9 of *Capital* III, he posits a capitalist economy with five industries or "spheres of production," with unequal organic compositions of capital (represented by given sectoral ratios of constant to variable capital), which have already produced given levels of surplus value based on the assumption that all commodities exchange at their respective values, subject only to the condition that *surplus* rates of *value* are equalized. It is evident that the commodities in these sectors are *not* bought and sold at their respective prices of production, since sectoral profit rates are not equalized.

Since different sectoral rates of profit are generated under these conditions, Marx poses the "transformation problem" as one of showing that economy-wide equalization of the rate of profit, given the stated sectoral magnitudes of constant and variable capital and "initial" surplus value, results in a "redistribution" of *pre-existing* surplus value such that aggregate values (expressed in monetary form) are equal to aggregate prices of production. As noted earlier, Marx does not assert a parallel inference concerning the equivalence of aggregate surplus value and aggregate profit (both gross of interest and land rent), because he has previously *defined* aggregate surplus value as being equal to aggregate profit: "We saw in the first Part of [this volume] how surplus value and profit were identical, seen from the point of view of their mass" (*C* III, 267).

The reader will have anticipated the clash between this formulation of the "transformation problem" in *Capital* III and Marx's definition of surplus value in *Capital* I (which, as FM notes, was written *after* the material subsequently edited and published by Engels as volume III of *Capital*): since the output of production financed by the initial outlay of *M* in the circuit of capital must be *sold* in order for the circuit of capital to be completed, and thus for surplus value to exist, Marx's representation of the transformation problem in *Capital* III assumes, in effect, that

commodities are first sold in some capitalist nether-world in which sectoral rates of profit are not equalized, and then somehow *resold* in an "actual" capitalist economy subject to the "equilibrium" condition of a single economy-wide rate of profit.

The essential inconsistency of this representation can be seen in the fact that there is necessarily some distribution of embodied labor times corresponding to the regime in which profit rates are equalized across sectors, although neither Marx nor FM has any way of calculating these magnitudes. Nonetheless, there is clearly no "redistribution" of values, as the same equilibrium that yields prices of production yields *at the same time* a particular distribution of labor values, even though prices of production and value-prices are disproportionate. The key difference is that, unlike in Marx's representation, this distribution is not premised on the initial exchange of commodities at their respective values.

It is clear, furthermore, that Marx *explicitly recognized* this problem, and acknowledges that analytical errors can arise if inputs as well as outputs are not valued at their respective prices of production:

> The [transformation procedure] given above also involves a modification in the determination of a commodity's cost price. It was originally assumed that the cost price of a commodity equaled the *value* the commodities consumed in its production. But for the buyer of a commodity, *it is the price of production* that constitutes its cost price and can thus enter into forming the price of another commodity. As the price of production of a commodity can diverge from its value, so the cost price of a commodity, in which the price of production of other commodities is involved, can also stand above or below the portion of its total value that is formed by the value of the means of production going into it. It is necessary to bear in mind this modified significance of the cost price, and therefore to bear in mind too that if the cost price of a commodity is equated with the value of the means of production used up in producing it, it is always possible to go wrong (*C* III, 265; latter emphasis added).

Note further that this assessment does not require that inputs be valued at the *same* prices of production as the outputs, so the fact that constant and variable capital magnitudes are taken as given in the current production period is irrelevant.

FM seemingly trivializes the inherent inconsistency in Marx's account, treating it as merely a matter of moving from a "partial" to a "complete" explanation of the determination of prices and aggregate surplus value. But it is much more than this, as the "partial" and "complete" explanations are mutually incongruous and inconsistent with Marx's definition of surplus value in *Capital* I.

2. General Theoretical Considerations with respect to FM's Macro-Monetary Account

2.1 The Metaphysical nature of FM's account

FM's macro-monetary system depends in a fundamental way on the unique existence of the parameter **m**, defined as the inverse of the magnitude of labor time socially necessary to produce a unit of the money commodity (gold). This magnitude is invoked to determine aggregate value prices, and in turn, aggregate production of surplus value, as well as the relationship between variable capital and necessary labor time.

The properties of **m** depend in turn on the possibility that this magnitude, which must reflect both direct labor and the labor time embodied in the means of production used up in producing gold, can be uniquely determined. However, Moseley explicitly rejects the conditions assumed by the "standard interpretation," according to which embodied labor times are determined by a system of simultaneous input/output equations, typically based on the assumptions of fixed input coefficients and constant returns to scale. This information is also combined with a given real wage rate in order to determine prices of production and the equilibrium profit rate.

FM rejects this system on the grounds that production is sequential, rather than simultaneous, such that outputs follow from an anterior commitment of inputs. It should be noted that such sequential production does not of itself contradict the formal condition of simultaneity, so long as the system can be taken to be in a steady state in equilibrium, so that given production and distribution conditions persist from one period to the next. In that case, temporal sequentiality is entirely consistent with formal simultaneity.

More critically for FM's theoretical approach, if such formal simultaneity *cannot* be assumed, as FM appears to insist, then the labor time socially necessary to produce a unit of gold, or of any other commodity, is in general indeterminate. The key problem here lies in determining the labor transferred from the means of production used up producing the money commodity, which depends in turn on the labor embodied in the means of production used up in producing the means of production used to produce the money commodity, which depends in turn on the labor embodied in the means of production used up in producing the means of production used in producing the means of production used in producing the money commodity, etc. In this case, there are far more variables than there are equations determining them, so that a particular labor value for the money commodity cannot be determined, much less uniquely so.

The indeterminacy problem becomes even worse if the traditional assumptions of fixed coefficients and constant returns are dropped. In the former case, the existence of alternative techniques implies that the particular technique used, and thus the commodity's labor value, cannot be determined without knowing the relative prices of productive inputs, assuming that capitalists choose the technique that minimizes unit costs for given input prices. In the latter case, the scale of production, and in turn the inputs required per unit of output, will depend on the level of market demand for the money commodity.

Given his rejection of the assumption of effectively simultaneous production conditions, FM bears the burden of proving that the labor value of the money commodity is determinable. However, he establishes no basis for such a conclusion, let alone providing a demonstration of how such a value can be uniquely determined. As a consequence, FM's theoretical system is essentially *metaphysical*, in the sense that it depends on a term "that is neither analytic [i.e., logically derived from explicitly stated axioms] nor subject to empirical verification" (*Webster's Third New International Dictionary* II, 1420). FM's theoretical claims cannot be empirically verified, even in principle, because he has not demonstrated that the labor value of the money commodity, and thus the magnitude **m**, is determinate.

A similar issue arises with respect to the determination of "abstract socially necessary labor time," which requires two complex modifications of empirical data on labor time: skilled labor must somehow be "reduced" to units of average or unskilled labor time, while "socially necessary" labor expenditures must be assessed under "average" production conditions in each sector.

2.2 The analytical subordination of labor in FM's account

A core aspect of Marx's critical assessment of the capitalist mode of production in *Capital* involves his insistence on the analytical primacy of commodity labor values, as seen in his repeated assertions that commodities' values, determined solely by the direct and indirect labor time socially necessary to produce them, "regulate" their average or equilibrium prices (*C* I, 269n; also see C I, 156, 168, 436, 476; *C* III, 277, 280, 774, 1020-21). According to Marx's consistent formulation in *Capital*, then, causation runs strictly from the labor time socially necessary for producing commodities to the determination of their average or equilibrium prices.

In positing that value prices are determined in part by constant capital expenditures, however, FM abandons this fundamental explanatory principle in Marx's account. Since constant capital expenditures are determined by the prices (of production, in equilibrium) of means of production, socially necessary labor time can no longer be considered the sole causal determinant of commodity prices. There is instead, in FM's account, a sequential process in which prices from previous periods irreducibly feature in the determination of current-period prices and values. Consequently, FM has indirectly, and perhaps inadvertently, affirmed one of the central points of the "standard interpretation's" critique of Marxian value theory, to the effect that commodity values cannot be considered analytically primary in determining capitalist outcomes.

2.3 The obscure basis of value price determination

FM asserts that aggregate value-prices are determined by the sum of aggregate constant capital expenditures $\mathbf{C}$, taken as given in the current production period, and aggregate current-period expenditures of direct labor $\mathbf{L}$ multiplied by a factor $\mathbf{m}$ representing the quantity of the money commodity (gold) produced per hour of abstract labor time. He refers to the latter product as "the new-value component of the value price of commodities," denoted $\mathbf{N}$, and describes the equation $\mathbf{N} = \mathbf{mL}$ as "*the key assumption in Marx's labor theory of value*" (p 31, emphasis original).

This characterization raises some immediate questions. First, FM gives no citation to Marx's work in support of this claim, and so far as I know, Marx never asserts this "key assumption." There are also several reasons to think that this attribution is suspect, starting with the fact that Marx, unlike FM, defines "value prices" as being proportional to their corresponding labor values, determined solely by socially necessary labor time, and thus having nothing to do with constant

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capital expenditures (determined by prices of production in the preceding period), as dictated by FM's formulation.

But there is also a difficulty with FM's characterization of "the new-value component of the value price of commodities," taken on its own terms. According to FM, his formulation is based on the premise that "[a]n hour of abstract labor *in all other industries*" is assumed to produce the same quantity of money value, **m**, as one hour of abstract labor gold industry (31; emphasis added). Enlarging on this point, FM writes (31-32):

> The difference between gold labor and all other labor is that one hour of abstract labor in the gold industry produces actual money value directly, as money itself, whereas one hour of abstract labor in all other industries produces the same amount of money value in the new-value component of the value-price of commodities…'

The difficulty with this formulation is that no indication is given of what it means to speak of "the money value produced per hour of abstract labor" in a non-gold producing industry if it were *not* the case that this magnitude, whatever it is, were assumed to be equal to **m**. Consequently, it is impossible to determine the significance or restrictiveness of this assumption. Is it tantamount to assuming that production conditions, (e.g., organic compositions of capital) are equal across industries? If not that, then what? It is impossible to tell from FM's account. In view of this, I argue that, without further elucidation by FM, the expression of aggregate value prices in terms of **C, m**, and **L** can only be taken as *definitional*, and thus bearing no implications about the comparison of production conditions across industries. And if it were to imply a particular restriction about comparative production conditions, the relevance of this restriction would presumably need to be justified on empirical grounds

2.4 *Necessary labor* **has no clear meaning in FM's account**

FM's definition of *necessary* (as opposed to *surplus*) labor time, which he attributes to Marx's account in Chapter 9 of *Capital* I, is "the number of hours of abstract labor that it takes the average worker to produce (money) new value that is equal to the average variable capital that is paid to the worker *per day*…" (33). However, this is a subtle but significant alteration of Marx's actual definition, which is initially stated in terms of labor, not money:

> We have seen that the labourer, during one portion of the labour-process, produces only the value of his labour-power, that is, the value of his means of subsistence. Now since his work forms part of a system, based on the social division of labour, he does not directly produce the actual necessaries which he himself consumes; he produces instead a particular commodity, yarn for example, whose value is equal to the value of those necessaries or of the money with which they can be bought. The portion of his day's labour devoted to this purpose, will be greater or less, in proportion to the value of the necessaries that he daily requires on an average, or, what amounts to the same thing, in proportion to the labour-time required on an average to produce them. If the value of those necessaries represent on an average the expenditure of six hours' labor, the workman must on an average work for six hours to produce that value….That portion of the working day, then, during which this reproduction takes place, I call "necessary" labor time… (*C* I,).

Marx's illustrations of this concept are also stated in monetary terms, to be sure, but that is justified by his explicit assumption, motivated in Chapter 5, that all commodities exchange at their respective values, so that commodity prices are proportional to their labor values. FM does not invoke this assumption in his framework.

Moreover, in FM's approach the current-period labor time necessary to replace the total labor embodied in the means of subsistence cannot be determined, even in principle, because there is no equation specified labor values in FM's system; in its place is an expression for "value price," or the "monetary expression of values," which includes the term **C**, aggregate constant capital

expenditures, that has *no specified relationship* to labor magnitudes, unlike in Marx's account. In place of Marx's explicit stipulation of commodity exchange at value, FM simply asserts the assumption that necessary labor time is equal to variable capital expenditures times the labor value of the money commodity. For reasons explained in the next section, there is no evident justification for this assumption. My point here is the more basic one that the concept of "necessary labor" does not even have a coherent meaning in FM's framework, because the total labor embodied in a given bundle of means of subsistence is *undefined* in his system, so that any specification of that magnitude is necessarily arbitrary.

3. *Non Sequitur* or Simple Tautology? Deconstructing FM's Algebraic Summary of the "Macro-Monetary" Interpretation of Marx's Theory

The point that must be noted immediately is that FM's "algebraic summary" of his macro-monetary system in chapter 2 of *M&T* is *only* that—an algebraic summary of aggregate relationships that FM believes to hold, including the proportionality of variable capital and necessary labor, the corresponding proportionality of surplus value and surplus labor, the equivalence of aggregate value prices and aggregate prices of production, and the equivalence of aggregate surplus value and aggregate profit. All of these results are merely asserted, rather than being derived as necessarily following from previously specified conditions. Indeed, it is unclear that such demonstrations are even possible in FM's formal system, given the high levels of aggregation at which most of the key terms are specified.

Consequently, FM's asserted results are *tautological* in the most basic sense of the term: they follow only because FM says that they do. In what follows, I provide some illustrations of why the asserted relationships cannot be expected to hold in the general case, given FM's definitions

of terms. However, objections to these specific counter-demonstrations, even if they were valid, do not serve to establish that FM's results are anything more than simple tautologies, if they are not false in general. Only an explicit formal derivation of the claimed results can achieve that.

3.1 Definition of aggregate value-prices and aggregate surplus value

The first seven equations of FM's algebraic summary in *M&T* (pp. 28-32) give expressions for aggregate value-prices and aggregate surplus value. These are:

(1) $\mathbf{S} = \mathbf{VP} - \mathbf{K}$

(2) $\mathbf{K} = \mathbf{C} + \mathbf{V}$

(3) $\mathbf{VP} = \mathbf{C} + \mathbf{N}$

(4) $\mathbf{N} = \mathbf{mL}$,

implying

(5) $\mathbf{VP} = \mathbf{C} + \mathbf{mL}$,

(6) $\mathbf{S} = (\mathbf{C} + \mathbf{N}) \textbf{-} (\mathbf{C} + \mathbf{V})$, and thus

(7) $\mathbf{S} = \mathbf{N} \textbf{-} \mathbf{V} = \mathbf{mL} \textbf{-} \mathbf{V}$, where:

VP denotes aggregate *value-prices* of commodities produced and sold in the current period, where *value-price* is defined as "the price form of appearance of [commodity] value in units of money" (29-30);

S denotes aggregate *surplus value* in the current period, denominated in money units;

C denotes aggregate *constant capital* expenditures on means of production in the previous period, determined by physical input requirements and corresponding prices of production in the previous period, and taken as given in the current period;

V denotes aggregate *variable capital* expenditures on labor-power, determined by direct labor input requirements and corresponding wage rates, and taken as given in the current period (though it is not specified whether means of subsistence are bought at the *previous period's* or the *current period's* prices of production;

K denotes aggregate *cost-prices* of commodities, defined as the sum of aggregate constant and variable capital;

Lc denotes aggregate *direct* labor expenditures in the current period[4];

N denotes the aggregate "new value" produced by current-period labor; and

m denotes the quantity of the money commodity (say, gold) produced per hour of abstract socially necessary labor.

Equations (1) and (2) imply $\mathbf{S} = \mathbf{VP} - (\mathbf{C} + \mathbf{V})$ and equations (3) and (4) imply (5), $\mathbf{VP} = \mathbf{C} + \mathbf{mL}$. Note that while **C, V,** and **L** can in principle by determined by empirical referents (respectively, total expenditures of money on means of production and labor power, and of current-period labor under average production conditions), determination of **S** requires the determination of aggregate value-prices, which requires in turn information on the determination of **m** and an explanation of the basis for the assumption that $\mathbf{mL} = \mathbf{V} + \mathbf{S}$, as dictated by equation (4).

To facilitate investigation of these questions, suppose that there are *n* commodity-producing industries in the economy in addition to the one producing the money commodity (gold), with a given non-gold industry denoted by subscript $j = 1, 2, ..., n$. Now let $\mathbf{\Lambda_g}$ denote the labor time socially necessary to produce a unit of gold, including both direct labor and labor embodied in

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used-up means of production, and similarly let Λ_j denote the labor time socially necessary to produce a unit of industry j's commodity.[5]

FM's definition of **m** implies that $\mathbf{m} = 1/\Lambda_g$. He then assumes that the quantity of money value per hour of socially necessary labor time is also equal to **m** for all industries, but the implications of this assumption are entirely unclear, as no expression is provided in *M&T* for this variable in the case of industries not producing the money commodity. Thus, it can't be determined *what* is being equated to **m** for all industries, so it is impossible to tell how plausible or realistic this assumption is, or how it provides more information than is already contained in the equation $\mathbf{m} = 1/\Lambda_g$. Thus, FM's equation (5) should be taking as *defining* value prices in terms of constant capital expenditure **C**, the labor value of gold Λ_g, and aggregate current-period direct labor expenditure **L**, rather than reflecting any underlying assumption about the equalization across industries of money value produced per unit of abstract labor time.

With this caveat in mind, consider the determination of aggregate surplus value **S** in FM's system, noting that by definition $\mathbf{V} = \mathbf{wL}$, where **w** is the average wage rate per hour of labor expended in the economy. Then from FM's equation (7) and this expression for **V**, we have

(7') $\mathbf{S} = \mathbf{mL} - \mathbf{V} = \mathbf{mL} - \mathbf{wL} = [(1/\Lambda_g) - \mathbf{w}] \cdot \mathbf{L}$.

This indicates that surplus value in FM's system is determined by production conditions in the money commodity-producing industry *alone*, as given by $1/\Lambda_g$, net of the average wage rate **w**, multiplied by total current-period labor expenditure. The magnitude of **w** is determined in turn by the prices of production of means of subsistence. Since Λ_g conveys no information about prices

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[5] I'm using Λ to denote total socially necessary labor time, including the labor embodied in used-up means of production, in order to distinguish it clearly from the *direct* or *living* labor time, denoted by L.

of production in either the previous or the current period, or about production conditions in any industry but that producing gold, it is unclear why this expression has anything to do with Marx's description of surplus value, or with the determination of total profit in actual capitalist economies. There is, in particular, no reason to believe that $\mathbf{S}$ would be equal to aggregate profits.

3.2 Necessary labor, surplus labor and surplus value

With equation (8) of the algebraic summary (p. 34), FM asserts a proportional relation between surplus value in given industries and the surplus *labor* extracted in those industries. Specifically, FM writes:

(8) $\mathbf{S_i = mL_i \text{-} V_i = mL_i \text{-} mNL_i = m(L_i \text{-} NL_i) = mSL_i}$, where

$\mathbf{S_i}$ denotes the surplus-value produced by the average worker per day;

$\mathbf{L_i}$ denotes the total current-period labor expended the average worker per day;

$\mathbf{NL_i}$, or necessary labor per day, denotes the portion of current-period labor expended by the average laborer in a day that just suffices to replay the variable capital expended in purchasing that worker's labor power; and

$\mathbf{SL_i = L_i \text{-} NL_i}$ denotes surplus labor per day, or the portion of the average working day left over after necessary labor has been performed.

When aggregated across workers and days, equation (8) becomes

(9) $\mathbf{S = mL \text{-} V = mL \text{-} mNL = m(L \text{-} NL) = mSL}$, [6]

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[6] FM instead writes (9) as $\mathbf{S = dnmSL_i}$, where $\mathbf{d}$ denotes total number of working days per year and $\mathbf{n}$ denotes the total number of workers employed. I've written (9) in this equivalent form in order to avoid introducing additional variables to the system that are not used subsequently.

where **NL** represents aggregate necessary labor and **SL** represents aggregate surplus labor time.

Equation (9) embodies the assumption that $\mathbf{NL} = \mathbf{V}/\mathbf{m}$, that is, that aggregate necessary labor time is just equal to aggregate variable capital divided by money value produced per hour of labor. This relationship is not derived explicitly, and it is unclear why this equation holds. On one side of the equation, **NL** represents the total labor time socially necessary to produce means of subsistence consumed by workers producing in the current period, while on the other, **V** represents total current-period labor expenditure multiplied by the average wage rate, which, as FM notes, is determined in turn by the prices of production of the means of subsistence. Since **m** is not itself determined by prices of production, however, it is unclear how division by this factor serves to "deflate" a measure based on prices of production to a measure representing necessary labor time.

In order to examine this point more closely, let *B* represent the subset of industries producing means of subsistence commodities, let $\mathbf{b_j}$ denote the quantity of commodity *j* consumed by a representative worker, and let $\mathbf{pp_j}$ as the unit price of production of good $j \in B$. Then by definition, aggregate variable capital **V** is given by

(8') $\mathbf{V} = \mathbf{wL_c} = \sum_{j\in B}\mathbf{pp_j}\mathbf{b_j}\mathbf{L_c} = \sum_{j\in B}\mathbf{PP_j}\mathbf{L_c}$,

where $\mathbf{PP_j}$ denotes aggregated production prices in sector *j,* assuming, as Marx does, that all wages are spent on means of subsistence.

Thus, FM's equation (9) requires

(9') $\mathbf{NL_c} = \sum_{j\in B}\mathbf{PP_j}\mathbf{L_c}/\mathbf{m} = \Lambda_g \sum_{j\in B}\mathbf{PP_j}\mathbf{L_c}$

which has no apparent sense. First, Λ_g is determined (albeit in a manner that FM does not spell out) solely by production conditions in the money commodity industry, with no reference to the wage or profit rate, and thus has no established relationship to aggregate prices of production based

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on profit rate equalization. But second, even if such a connection were shown, this does not establish the connection between **m** and aggregate prices of production *for the subset of the economy producing means of subsistence*. Thus, the proportionality of surplus value and surplus labor indicated by FM's equation (9) does not obtain in general.

3.3 Prices of production, the rate of profit, and Marx's "aggregate equalities"

Equations (10) – (12) of FM's algebraic summary provides expressions for prices of production and the general rate of profit, intended to describe a capitalist economy in a hypothetical equilibrium state in which the rate of profit is equalized across industries. Specifically, FM writes:

(10) $\mathbf{PP_i} = \mathbf{K_i} + \mathbf{RM_i}$

(11) $\mathbf{R} = \mathbf{S}/\mathbf{M}$, where

$\mathbf{PP_i}$ denotes aggregate prices of production in industry *i*;

$\mathbf{K_i}$ denotes aggregate cost prices in industry *i*;

$\mathbf{M_i}$ denotes the total capital stock in industry *i*, denominated in money; and

$\mathbf{R}$ denotes the "price rate of profit."

FM is careful to distinguish $\mathbf{R}$, the profit rate based on "actual (equilibrium) prices" in the economy, from the so-called "value rate of profit" (36). However, it should be clear from the preceding analysis (as reflected in equation (7')) that there is no evident basis for believing that $\mathbf{S}$ as specified in FM's system is equivalent to aggregate profits based on prices of production. To see this, let $\mathbf{PP}$ denote aggregate prices of production in the economy and $\mathbf{\Pi}$ denote aggregate profits in this economy. Then it is evidently the case that

(10') $\mathbf{\Pi} = \mathbf{PP} - (\mathbf{C} + \mathbf{V})$.

Comparison with FM's equations (1) and (2) shows that $\mathbf{\Pi} = \mathbf{S}$ if and only if $\mathbf{PP} = \mathbf{P}$. This equality has not been established. However, if it were true, it then follows from FM's equation (5) that $\mathbf{PP} = \mathbf{C} + \mathbf{mL}$, which implies in turn that $\mathbf{m} = (\mathbf{PP} \text{-} \mathbf{C}) / \mathbf{L}$. Thus, for Marx's "aggregate equalities" to obtain in FM's formal system, given FM's specification that $\mathbf{m} = \mathbf{1} / \mathbf{\Lambda_g}$, it must be the case that

(11') $\mathbf{1} / \mathbf{\Lambda_g} = (\mathbf{PP} \text{-} \mathbf{C}) / \mathbf{L}$

It should be clear, however, that (11') will not hold except by accident. The left-hand side of the expression is determined solely by production conditions in the gold-producing industry, with no reference to prices of production or production conditions in other industries. The numerator of the right-hand side, in contrast, is determined by prices of production in two different periods, the current period (for $\mathbf{PP}$) and the previous period (for $\mathbf{C}$) and the denominator depends on direct labor inputs and total outputs in all other industries. Thus, FM's subsequent assertions of Marx's aggregate identities (38-40) simply *do not obtain* in the general case, unless one of two conditions were true, both of which involve directly or indirectly establishing the conclusion by *assuming* it.

First, one could, of course, *define* $\mathbf{m}$ to be given by $(\mathbf{PP} \text{-} \mathbf{C}) / \mathbf{L}$, but in that case the aggregate identities hold only because they were arbitrarily *assumed* to obtain in the first place. Second, Marx's aggregate identities would obtain if it were the case that commodity value-prices were assumed to be identical to their corresponding prices of production. But in that case, Marx's transformation problem is "solved" only by assuming it away. Thus, FM's algebraic demonstration is a *non sequitur* if it is not a simple tautology.

4. The irrelevance of Marx's "transformation" analysis

The point of Marx's transformation analysis in *Capital* III was to demonstrate that profit rate equalization due to capitalist competition does not vitiate his argument in *Capital* I that the source of capitalist profit is surplus labor involving the exploitation of labor power. As discussed in section 2 above, this argument is misconceived, in that it posits a capitalist nether-world in which products are first sold, and surplus value is established, on the basis of value prices yielding unequal sectoral rates of profit, and then somehow resold in a market system that "redistributes" the surplus value previously established by equalizing these profit rates. There is no coherent reason to think that capitalism "produces" surplus value in this manner, even in principle.

In addition, Marx's "transformation" procedure obscures the point that a given production-price regime with equalized sectoral profit rates must correspond to a sectoral distribution of direct and indirect labor times embodied in commodities, so there is no "transformation" to analyze: assuming that labor values are determinable (which is no small assumption), labor values and prices of production always co-exist in the same equilibrium. Thus, the real question is whether the existence of a positive rate of profit in the equal-profit rate equilibrium corresponds to the existence of surplus labor. If this result holds, attempts to square the circle by showing the *equality* of aggregate values and prices of production are essentially superfluous.

Marx had no mathematical basis for pursuing this question, as doing so requires the ability to derive both labor values and prices of production from a given set of production conditions and information on the real wage rate. One of the important contributions of the "standard interpretation" criticized by FM is to establish explicit conditions under which the correspondence of a positive profit rate with a positive rate of exploitation, known as the

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"fundamental Marxian theorem," obtains (Roemer (1986), 23). Such analysis is a double-edged sword, however, because it also reveals the limited set of conditions under which Marx's notion of commodity valuation in terms of labor time has coherence.

FM's approach, as we have seen, is to omit any primitive expression of the total labor time necessary to produce any bundle of non-money commodities, substituting an arbitrary assumption about the connection between variable capital (determined by money prices) and current-period labor expenditures. This procedure effectively imposes the Fundamental Marxian Theorem by fiat, rather than deriving it by analysis of underlying conditions of production and class distribution.

An alternative procedure has been pursued in the axiomatic approach to value theory put forward by Roberto Veneziani and Naoki Yoshihara in a string of recent papers (Yoshihara and Veneziani 2009, 2013; Veneziani and Yoshihara, 2015, 2017). The key to their approach is to define exploitation in labor terms, but without invoking the notion of labor "embodied" in given bundles of commodities. Unlike in FM's approach, however, they define exploitation at the microeconomic level by contrasting the labor times agents with different wealth levels must perform in order to afford reference bundles on their budget frontiers, relative to labor time required *on average* to afford these bundles. The latter serves as a coherent basis for defining "necessary labor time" rather than simply stipulating it as in FM's approach, and makes possible determination of the correspondence between positive profit and exploitation. In the economic settings they study, there is thus no necessity of asserting any equivalence between aggregate prices of production and aggregate value prices.

5. The Significance of *Money and Totality*

Although I don't think that FM's analysis in *Money and Totality* can be understood to provide a coherent resolution of the "transformation problem," there is no doubt that it makes a significant contribution to Marxian scholarship. In my view, this is true for two reasons. First, the work provides a panoramic economist's view of the development of Marx's economic analysis over the four main drafts of his *Capital* project, culminating in his publication of the first volume of *Capital*, while raising interesting theoretical questions prompted by particular passages in Marx's unpublished notebooks. Whether or not one agrees with FM's answers to these questions, his work provides a starting point for new lines of investigation into Marx's economic thought.

The second reason is somewhat more speculative. FM emphasizes, correctly, that the key concepts of Marx's theory of value and exploitation, particularly *surplus value*, *constant capital*, and *variable capital*, are denominated in *monetary* terms and are generally expressed as *macroeconomic* aggregates. Thus there is presumptive validity to an approach to Marxian theory that emphasizes the role of money operating at a macroeconomic level. Furthermore, as FM notes, this represents a key departure from Sraffian and mainstream equilibrium analysis, in which money is essentially superfluous. However, my reading of *Money and Totality* is that the theoretical implications of this emphasis have only begun to be explored. Thus this aspect of FM's approach, too, offers promising grounds for future lines of research in Marxian economics.

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