

**MONEY HAS NO PRICE:  
MARX'S THEORY OF MONEY AND THE TRANSFORMATION PROBLEM**

**by Fred Moseley**

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Gold is a commodity like all other commodities,  
and at the same time,  
it is not a commodity like other commodities.

Marx, *The Grundrisse*, p. 151

According to the standard interpretation of the “transformation problem” in Marx’s theory (i.e. the Bortkiewicz-Sweezy interpretation), the money commodity (e.g. gold) is treated as essentially the same as all other commodities. In the first place, it is assumed that the money-commodity has a value-price (price proportional to labor-time) and also has a price of production, which could be different from its value-price, just like all other commodities. Secondly, it is assumed that the rate of profit is equalized in the gold industry, just like in all other industries. Finally (assuming that the composition of capital in the gold industry is below the average composition of capital), it is argued that the prices of production of other commodities (with a higher composition of capital) are increased as a result of the equalization of the profit rate in the gold industry, so that the total price of production of commodities is greater than the total value-price of commodities.

This paper argues that this standard interpretation of the transformation is mistaken on all three of these important points, that have to do with the money commodity (and is also wrong in other fundamental respects as well). I argue that the money commodity has neither a value-price nor a price of production, so that a transformation of the former into the latter is not possible. Further, I argue that the rate of profit is not equalized in the gold industry, because of the special characteristics and functions of the money commodity. Finally, I argue that, since the rate of profit is not equalized in the gold industry, the prices of production of other commodities

cannot possibly be affected by a non-existent equalization of the profit rate in the gold industry. Hence, Marx's conclusion that the total price of production of commodities is *always equal* to the total value-price of commodities (and that total profit is always equal to total surplus-value) remains valid, no matter what the composition of capital in the gold industry.

The first section of the paper presents my interpretation of the role of money in Marx's theory in general and in the transformation problem, and then the second section critically examines the Bortkiewicz-Sweezy interpretation of Marx's theory of money and the transformation problem. My general interpretation of the transformation problem is presented in Moseley (1993, 2000, and 2004).

### **1. Marx's basic theory of money and the transformation problem**

Part 1 of Volume 1 is usually thought of as the part of *Capital* in which abstract labor is derived as the "substance of value" that determines the exchange-values of commodities. However, this derivation, as important as it is, is only the beginning of Part 1 - it is accomplished in the first ten pages. The rest of Part 1 - the remaining one hundred pages - is about *money*, and presents Marx's basic theory of money. Section 3 of Chapter 1 derives the necessity of money in a commodity-producing economy, as the "necessary form of appearance" of the abstract labor contained in commodities (as derived in Section 1). Chapter 2 discusses the actual emergence of money out of the actual process of circulation. Chapter 3 discusses the main functions that money performs as part of the circulation of commodities: *measure of value* (the objective social representation of the abstract labor contained in commodities), *means of circulation* (the means by which commodity-owners exchange their commodities for other commodities), and *money* itself (hoards, means of payments for debts, and "world money" or international reserves). This basic theory of money is entirely ignored by Bortkiewicz and Sweezy. In other words, Bortkiewicz and Sweezy attempt to interpret the role of money in the determination of prices of production in Volume 3, without having first considered Marx's basic theory of money in Volume 1. This omission is bound to lead to mistakes, as we shall see below.<sup>1</sup>

## 1.1 Money has no price

The most important conclusion of Marx's theory of money in Part 1 of Volume 3, relevant to the role of money in the determination of prices of production in Volume 3, is that the money commodity (e.g. gold) itself *has no price*.<sup>2</sup> According to Marx's theory in Part 1, the *price* of a given commodity is the outward, visible expression of the value of commodities (i.e. the socially necessary labor-time contained in commodities) in terms of a quantity of the money commodity (e.g. gold). It follows from this concept of price (e.g. quantity of gold) that gold itself cannot have a price, because the socially necessary labor-time contained in gold cannot be expressed or measured in terms of gold itself, but can only be expressed in terms some *other* commodity. Marx emphasized from the very beginning of his theory of money (in the discussion of the "simple form of value") that the commodity whose value is being expressed and the commodity which serves as the measure of value are "mutually exclusive" from each other, i.e. a commodity cannot serve as its own measure of value.

The same commodity cannot, therefore, simultaneously appear in both forms in the same expression of value. These forms rather *exclude each other as polar opposites*. (C.I. 140; emphasis added).

And elsewhere:

*[M]oney has no price*. In order to form a part of this relative form of value of the other commodities, it would have to be brought into relation with itself as its own equivalent. (C.I: 189; emphasis added)<sup>3</sup>

Gold has neither a *fixed price nor any price* at all, when it is a factor in the determination of prices and therefore functions as money of account. In order to have a price, in other words to be expressed in terms of a *specific* commodity functioning as the *universal* equivalent, this other commodity would have to play the same exclusive role in the process of circulation as gold. But two commodities which exclude all other commodities would exclude each other as well. (Cr. 75)

The price of the commodity which serves as a measure of value and hence as money, *does not exist at all*, because otherwise, apart from the commodity which serves as money I would need a second commodity to serve as money - double

measure of value. ... *There can therefore be no talk of a rise or fall in the price of money.* (TSV.II: 201; italicized emphasis added)

We will see below that, because gold does not have a price, there is no price of gold that could be transformed from a value-price to a price of production in the theory of the distribution of surplus-value in Volume 3.

## 1.2 Circulation of capital in the gold industry

Because gold has no price, the circuit of capital is different in the gold industry from all other industries. The value-product of the gold industry is not a commodity with a price, but rather a definite quantity of gold itself. Gold is not like all other commodities, which have to be sold in order to be converted into money. Instead, gold is *already money*, as a result of the production process, prior to circulation. Therefore, the circuit of capital in the gold industry is represented by the following unique formula:<sup>4</sup>

**M - C ... P ... M'.**

Notice that the third phase of the circuit of capital in the gold industry is simply **M'**, instead of the usual **C' - M'**. The price of the commodity-product (**C'**) is missing, because gold has no price. The product of gold production is money itself, not a commodity with a price that has to be converted into money.

Marx discussed this unique form of the circuit of capital in the gold industry in the following passages from Volume 2 of *Capital*.

The formula for the production of gold, for example, would be **M - C ... P ... M'**, where **M'** figures as the commodity product in so far as **P** provides more gold than was advanced for the elements of production of gold in the first **M**, the money capital. (C.II: 131)

Let us firstly consider the circuit of turnover of the capital invested in the production of precious metals in the form **M - C ... P ... M'**. ... Let us start by considering only the circulating part of the capital advanced as **M**, the starting-point of **M - C ... P ... M'**. In this case *a certain sum of money is advanced* and cast into circulation in payment for labour-power and in order to purchase materials of production. The money is not

withdrawn again from circulation by the circuit of this capital, and then cast in afresh. The *product in its natural form is already money*, it does not need to be first transformed into money by exchange, by a process of circulation. It moves from the production process into the circulation sphere not in the form of commodity capital that has to be transformed back into money capital, but rather as money capital that has to be transformed back into productive capital, i.e. has to buy new labour-power and materials of production. The money form of the circulating capital, that consumed in labour-power and means of production, is replaced not by the sale of the product, but rather by the natural form of the product itself, i.e. not by withdrawing its value again from circulation in the money form, but rather by adding money newly produced. (C.II: 401-02; italicized emphasis added)

We will see below that, because the value-product of the gold industry is a definite quantity of gold ( $M'$ ), this quantity of gold remains the same in both the Volume 1 theory of value and surplus-value and the Volume 3 theory of the distribution of surplus-value and prices of production.

### 1.3 Quantity of money in circulation

Another important conclusion derived in Part 1 of Volume 1, that is related to the role of money in the determination of prices of production, is that the *quantity of money in circulation* is determined by the *sum of the prices* of all the commodities in circulation and also by the *velocity* of money (the rapidity with which the money in circulation is used over and over again). The sum of prices in turn depends on the labor-times contained in the commodities and the labor-time contained in a unit of gold. We can see that this conclusion is the *opposite* of the “quantity theory of money” of Ricardo and many others, which Marx severely criticized (C.I. 219-21; Cr. 102-07 and 157-87).

Marx argued that the actual quantity of money in circulation would tend to adjust toward the quantity of money required for circulation, as determined by the sum of prices, through the *hoarding and dishoarding* of money and/or through a *change in the velocity of money* (C.I. 217-19; Cr. 136). For example, if the actual quantity of money

were less than what was required by the sum of prices, then money would be taken out of hoards (“dishoarded”) or the velocity of money would increase. And vice versa, of course.

The total quantity of money required for circulation (TM) consists of two parts: the money already existing in circulation (MC) and the gold produced in the current period of production (MP); i.e.  $TM = MC + MP$ . The vast majority of the total money required for circulation is supplied by money already existing in the sphere of circulation, which was produced in previous periods. This is another unique characteristic of money - it does not pass through the sphere of circulation only temporarily, on the road to its ultimate destination of consumption outside the sphere of circulation. Instead, unlike all other commodities, the money commodity remains in the sphere of circulation indefinitely, until it wears out and is replaced by new gold. The quantity of gold currently produced must be enough to replace the worn-out gold and to accommodate any increase in the total price of commodities.

We will see below that Bortkiewicz and Sweezy consider only the quantity of gold currently produced, and ignore entirely the much larger quantity of gold already existing in circulation, which leads them to erroneous conclusions regarding the effects of a change in the quantity of gold currently produced on the prices of commodities.

#### **1.4 Surplus-value in the gold industry**

The surplus-value produced in the gold industry ( $S_G$ ) during a given period is equal to the difference between the quantity of gold produced ( $M'_G$ ) in that period and the initial quantity of money-capital advanced ( $M_G$ ) to purchase means of production and labor-power in the first phase of the circuit of capital in the gold industry. Algebraically:

$$(1) \quad S_G = \Delta M_G = M'_G - M_G.$$

We have already seen that the value-product of the gold industry is not a commodity with a price, but is rather a definite quantity of gold produced ( $M'_G$ ). This

quantity of gold is *taken as given*, as the *actual* quantity of gold produced in the gold industry during a given period of time.

Furthermore, the initial money-capital ( $\mathbf{M}_G$ ) is also *taken as given*, as the *actual* quantity of money-capital *advanced* to purchase means of production and labor-power in the gold industry. This assumption is consistent with Marx's general method of determination of the initial money-capital (constant capital and variable capital) in Marx's theory of surplus-value in Volume 1, as discussed in Moseley 1993, 1997, and 2004.<sup>5</sup>

Since the value-product of the gold industry ( $\mathbf{M}'_G$ ) is the actual quantity of gold produced, and the initial money-capital ( $\mathbf{M}_G$ ) is the actual quantity of money-capital advanced in the gold industry, it follows that surplus-value in the gold industry ( $\mathbf{S}_G = \square\mathbf{M}_G$ ) is the difference between these two actual quantities, i.e. is equal to the *actual* surplus gold produced, over and above the actual initial money-capital advanced. Unlike all other industries, the surplus-value in the gold industry does not consist of a part of the price of the output (since gold has no price), but instead consists of a definite quantity of surplus gold "from the start", i.e. as the direct result of the production process itself, prior to circulation.<sup>6</sup> This important point is clear in the following passages:

*The gold-producing capitalists possess their entire product in gold, including the part of it which replaces constant capital, the part which replaces variable capital, and the part which consists of surplus-value. One part of the society's surplus-value thus consists of gold, and not of products that are turned into money only in the course of circulation. It consists of gold from the start and is cast into the circulation sphere in order to withdraw products from this. (C.II: 410; emphasis added)*

[In the gold or silver industry], *surplus-value is directly in gold or silver as a surplus of gold or silver. (MECW.33. 193; emphasis added)*

### **1.5 Profit in the gold industry: no "sharing" of surplus-value**

Volume 3 of *Capital* is about the *distribution of surplus-value*, i.e. the division of the total surplus-value produced in a given period into individual parts - first the

equalization of the profit rate across industries (Part 2), and then the further division of surplus-value into industrial profit, commercial profit, interest, and rent (Parts 4-6). The equalization of the profit rate across industries analyzed in Part 2 involves the determination of the *price of production* of commodities. The transformation of value-prices into prices of production redistributes the surplus-value produced in a given period across industries in such a way that the rates of profit in all industries are equal. The result of this redistribution of surplus-value is that the profit received in each industry is in general *not* equal to the surplus-value produced in that industry. In this way, there is a “sharing” of surplus-value among capitalists, like “hostile brothers who divide among themselves the loot of other people’s labor” (TSV.II: 29), or a form of “capitalism communism” in which the profit received in each industry is proportional to the total capital invested in that industry, rather than equal to the surplus-value produced in that industry. (SC: 193) (See Moseley 1997 and 2002 for further discussions of this important point.)

However, according to Marx’s theory, there is *no sharing of surplus-value between the gold industry* and other industries, because the profit received in the gold industry is *always identically equal* to the surplus-value produced in the gold industry. We have seen above that the surplus-value produced in the gold industry ( $S_G$ ) is the actual quantity of surplus gold produced, i.e. is equal to the difference ( $\square M_G$ ) between the actual quantity of gold produced ( $M'_G$ ) and the actual money-capital advanced in the gold industry ( $M_G$ ):

$$(1) \quad S_G = \square M_G = M'_G - M_G.$$

Similarly, the profit received in the gold industry ( $\square_G$ ) is also equal to this *same actual* surplus quantity of gold produced ( $\square M_G$ ), i.e. is equal to the same difference between the actual quantity of gold produced ( $M'_G$ ) and the actual money-capital advanced in the gold industry ( $M_G$ ):

$$(2) \quad \square_G = \square M_G = M'_G - M_G$$

Since gold has no price, it also has no price of production. There is no price of gold that could be transformed from a value-price to a price of production, in order to share surplus-value and equalize the rate of profit in the gold industry. Instead, as we have seen above, the value-product of the gold industry is a definite quantity of gold ( $\mathbf{M}'_G$ ), which is the same for the determination of both the surplus-value produced in the gold industry (equation 1) and the profit received in the gold industry (equation 2).<sup>7</sup>

Similarly, the quantity of initial money-capital ( $\mathbf{M}_G$ ) is also *the same* in both of these equations - the *actual* quantity of money-capital advanced in the gold industry - which is *taken as given* both in the determination of the surplus-value produced and in the determination of the profit received in the gold industry. Again, this assumption is consistent with Marx's general method of determination of the initial money-capital (constant capital and variable capital) in Marx's theory of surplus-value in Volume 1 and his theory of prices of production in Volume 3, again as discussed in Moseley 1993, 1997, and 2004.<sup>8</sup>

Since both the value-product in the gold industry ( $\mathbf{M}'_G$ ) and the initial money-capital advanced in the gold industry ( $\mathbf{M}_G$ ) are the same in both equation (1) and equation (2), it follows that *the profit received in the gold industry is always identically equal to the surplus-value produced* in the gold industry ( i.e.  $\Pi_G = S_G = \Pi \mathbf{M}_G$ ). Thus, according to Marx's theory, *there is no "sharing" of the surplus-value* produced within a given period between the gold industry and all other industries. The surplus-value produced in the gold industry within a given period is a definite quantity of actual surplus gold produced, which cannot change into a different quantity of profit through the sharing of surplus-value with other industries.

This conclusion implies that, if the composition of capital in the gold industry is not equal to the average composition of capital (and if it is assumed that the rate of surplus-value in the gold industry is equal to the average rate of surplus-value), then the rate of profit in the gold industry would not be equal to the general rate of profit. Under the

assumption of equal rates of surplus-value, the only way the rate of profit in the gold industry could be equal to the average rate of profit would be if the composition of capital in the gold industry were equal to the average composition of capital. On the other hand, the assumption of equal rates of surplus-value could be dropped, which would provide another way the rate of profit could be equalized in the gold industry.

Marx assumed that the composition of capital in the gold industry was *lower* than the average composition of capital (as he generally did for all of mining and agriculture). This assumption of lower than average composition of capital in the gold industry was clearly valid during Marx's time in the 19th century, and it also appears to have been true in the 20th century.<sup>9</sup> In this case, the rate of profit in the gold industry is *higher* than the average rate of profit. The excess profit is collected by the owners of the gold mines as their absolute rent.<sup>10</sup>

Marx discussed this conclusion about the rate of profit in the gold industry in the following passages from the *Manuscript of 1861-63*:

As regards absolute rent, let us take a gold mine. We assume that the capital employed is £100, the average profit £10, rent £10, and that half the capital consists of constant capital (in this case, machinery and auxiliary materials) and half of variable capital. The £50 of constant capital means nothing more than that it contains the same amount of labour-time as that embodied in £50 of gold. That part of the product which is worth £50 therefore replaces this constant capital. If the rest of the product is worth £70 and if 50 workers are set to work with the £50 of variable capital, then the labour of these 50 workers must be expressed in £70 worth of gold, of which £50 goes to pay wages and £20 represents unpaid labour. The value of the products of all capitals of the same composition will then be 120; the product will then consist of 50c and 70, [the 70] corresponding to 50 working-days, that is, 50v plus 20s. A capital of 100, utilising more constant capital and a smaller number of workers, would produce a product of less value. However, all ordinary industrial capitals, although the value of their products would, in these circumstances, amount to 120, would only sell them at their production price of 110. *But in the case of the gold mine, this is impossible quite apart from the ownership of land, because in this case the value is*

*expressed in the product in kind. A rent of £10 would therefore of necessity arise.* (TSV.III: 403-04; italicized emphasis added)

*The production of gold and silver is distinguished from all other branches of production by the fact that here, rather than comparing the value of the product with the value of the outlay, we must compare the money value of the outlay, the expenses monetarily expressed, with the total amount of the product. The outlay, £100, = a certain mass of gold. Its price of £100 is merely the expression in the language of money of account of the fact that the outlay = a certain quantity of gold. Hence if the product is 130, i.e. if it contains 3/10 more gold than the outlay, the profit = 30%. The rate of profit (which here includes rent) is determined purely by the excess of the use value obtained (gold) over the outlay (similarly in gold), expressed in the same use value (gold). And this is entirely independent of the value of the gold. An equalisation of the profit can here only take place to the extent that if the rate of profit = 10% and the excess of gold = 30, this 30 may be split up into rent and profit.* (MECW.33: 191; emphasis added)

We will see below that Bortkiewicz and Sweezy assume that the rate of profit is equalized in the gold industry in a given period through the usual mechanism of “sharing” surplus-value with other industries. However, we can already see that, according to Marx’s theory of money and his logical method, such a “sharing” of surplus-value is not possible in the gold industry.

## **1.6 Total value-price equal to total price of production**

I have argued in previous papers that both of Marx’s two aggregate equalities (total price of production = total value-price and total profit = total surplus-value) are *always identically true* by the nature of Marx’s logical method (see Moseley 1993, 1997, and 2004). These equations are not conditional equalities, which may or may not be true, but rather follow from Marx’s method of determination of price of production and profit.

This conclusion is not affected by the consideration in this paper of the nature of money and role of money in the distribution of surplus-value across industries. Since the gold industry does not participate in the sharing of surplus-value or the equalization of the profit rate across industries, the price of production of all other commodities cannot

be affected by a non-existent sharing of surplus-value in the gold industry. Hence the total price of production of all other commodities is also not affected, and remains identically equal to the total value-price of all commodities. This point will become clearer after the discussion of Bortkiewicz and Sweezy's interpretation of Marx's theory in the next section. Bortkiewicz and Sweezy argue that the equalization of the profit rate in the gold industry does involve the sharing of surplus-value with other industries and thus also affects the prices of production of other commodities, such that the total price of production is *not* equal to the total value-price, contrary to Marx's conclusion. We will see that this mistaken conclusion follows from their failure to understand the unique role of money in Marx's theory.

### **1.7 No equalization of the profit rate in the gold industry**

The previous sections have argued that, according to Marx's theory, there is no sharing of surplus-value between the gold industry and other industries in a single period analysis of the distribution of surplus-value through the transformation of values into prices of production, and thus it is not possible to equalize the rate of profit in the gold industry in such a single period transformation, unless the composition of capital in the gold industry is equal to the average composition of capital. In addition, it also follows from Marx's theory that there is no tendency for the rate of profit in the gold industry to be equalized with other industries over successive periods of time, through the usual mechanism of capital transfers from industries with lower than average rate of profit to industries with higher than average rate of profit.

In the first place, the usual process of equalization is that these capital transfers lead to changes in the supplies of the commodities in the industries involved, and thus ultimately lead to changes in the prices of the output of these industries. However, this usual process is not possible in the case of the gold industry, because gold has no price,

and therefore there cannot be changes in the price of gold that equalize the rate of profit in the gold industry.

One could perhaps imagine that the adjustment process in the gold industry to the general rate of profit might be something like the following, similar to the usual process, but also different in other crucial respects. The process might begin with capital flows between the gold industry and other industries, which would change the relative supplies of gold and the output in these other industries. For example, if the rate of profit in the gold industry were *higher* than the general rate of profit, then capital might flow from other industries to the gold industry, which in turn would increase the quantity of gold produced. In other industries, an increased quantity of output would reduce the price of the output, and thereby lower the rate of profit in that industry toward the general rate of profit. However, this change in the price of the output is not possible in the gold industry, because gold has no price. In this case, it might be assumed that the increased quantity of gold produced would result in a relative oversupply of gold, which in turn would increase the prices of all other commodities, including the prices of the inputs to gold production, which would reduce the rate of profit in the gold industry toward the general rate of profit. We can see that this possible mechanism to equalize the rate of profit in the gold industry (through capital flows leading to changes in the prices of all other commodities) *assumes that a change in the quantity of money currently produced would cause a change in the prices of all other commodities*, i.e. assumes a crude version of the quantity theory of money, which is clearly contrary to Marx's theory, and which Marx severely criticized. (For example, Itoh (this volume) assumes such a process of equalization.)

However, there are two main reasons why such an alternative process of equalization of the profit rate in the gold industry over time, by means of capital flows leading to changes in the prices of the inputs to gold production, *is not possible*, according to Marx's theory. In the first place, such capital flows between the gold industry and

other industries are not likely to occur. We have seen above that the composition of capital in the gold industry throughout the history of capitalism has been lower than average, which means that the rate of profit in the gold industry in the absence of capital flows would be higher than the average rate of profit. In this case, however, outside capital would not be permitted to flow into the gold industry, because gold is a privately-owned, scarce natural resource. The owners of the gold mines would prohibit any such inflows of capital into the gold industry, and would collect the difference between the higher rate of profit in the gold industry and the general rate of profit as their absolute rent, as analyzed in Marx's theory, as we have seen above.<sup>11</sup>

Secondly, there is an even more fundamental reason why, according to Marx's theory, such an alternative process of equalization of the rate of profit in the gold industry is not possible. Even if there were capital flows in or out of the gold industry, and the quantity of gold currently produced increased or decreased, *this would not result in a change in the prices of all other commodities*, because the prices of other commodities do not depend on the quantity of gold currently produced, but instead the sum of prices depends on the total labor-time required to produce them.

The sum of prices, together with the velocity of money, in turn determine the total quantity of money required for circulation. As we have seen above (Section 1.3), the quantity of gold currently produced (MP) is only a very small part of the total money required for circulation (TM). The much larger part of the total money in circulation is the money already in circulation (MC), accumulated from previous periods throughout the history of capitalism. According to Marx's theory of the quantity of money, discussed above in Section 1.3, a change in the quantity of gold currently produced does not change the prices of other commodities, but is instead offset by a change in the velocity of money and/or a change in the quantity of money already in circulation due to hoarding or dishoarding.

For example, in the unlikely case of an above average composition of capital and a below average rate of profit in the gold industry, if an outflow of capital from the gold industry leads to a reduction in the quantity of gold currently produced and a temporary shortage of money in circulation, *this reduction would not affect the total quantity of money required for circulation*, which continues to be determined by the sum of prices (which in turn is ultimately determined by the sum of labor-times, which we assume have not changed) and the velocity of money. Instead, such a reduction in the quantity of gold currently produced would be offset by dishoarding and/or an increase in the velocity of money, in order to adjust the total money in circulation to the unchanged total price of commodities. The prices of all other commodities, including the inputs to gold production, would remain the same, and so would the rate of profit in the gold industry, because of the offsetting effects of dishoarding and/or an increase in the velocity of money.

Thus we can see that, according to Marx's theory, there is no tendency for the rate of profit to be equalized in the gold industry, through the usual process of capital flows, etc. The gold industry almost certainly has a lower than average composition of capital and thus a higher than average rate of profit. In this case, there is no tendency toward equalization of the profit rate because the private ownership of gold, a scarce natural resource, prohibits the inflow of capital, and enables the owners of the gold mines to collect absolute rent. In the unlikely case of a higher than average composition of capital and a lower than average rate of profit in the gold industry, there is still no tendency toward equalization, because any outflow of capital would be offset by the dishoarding of money and/or an increase in the velocity of money, in order to keep the total money in circulation constant.

Furthermore, even if Marx's theory is wrong on both of these points - i.e. if private ownership of gold is not a barrier to increased gold production when the rate of profit in the gold industry is above average, and/or if changes in the quantity of gold

currently produced are not offset by changes in the quantity of hoards or changes in the velocity of money, but instead lead to a change in the prices of all other commodities - it is still not clear how such a general change of prices would equalize the rate of profit in the gold industry. The presumed effect is that the general price change would include the prices of the inputs to gold production (constant capital and variable capital), which in turn would affect the rate of profit in the gold industry. For example, in the likely case of an above average rate of profit in the gold industry, an inflow of capital and an increase of gold production would lead to an increase in the general price level which would in turn increase the prices of the inputs to gold production and reduce the rate of profit in the gold industry.

However, there are several reasons why this presumed effect on the rate of profit in the gold industry would be very small at best, and more likely to be non-existent. In the first place, as already discussed, there already exists a large stock of money in circulation, so that an increase of gold currently produced would have only a very small effect on the total money in circulation, and thus would have only a very small effect on the prices of all other commodities. For example, if current gold production were 5% of the total quantity of money in circulation, and if gold production were increased by 10%, this would increase the total quantity of money in circulation by only 0.5%.

Furthermore, even if prices generally increased, the effect of this general increase on the prices of the inputs to gold production is likely to be small at best. In the first place, there are no raw material costs for the gold industry, because they own their own raw material - gold! Secondly, the machinery and equipment used in gold mining lasts a long time and is replaced only very infrequently. The main cost in gold production is wages; over half of the total costs in the South African gold industry, which produced most of the world's gold in the 20th century, has been wage costs (Wilson, p. 160). Therefore, the main way in which a general price increase (or decrease) could have a significant effect on the rate of profit in the gold industry would be if the increase in the

price of wage goods led to an increase in the wages of the gold miners, thereby reducing the rate of profit. However, this effect also does not appear to be very likely. Wages in South African gold mines were set by the employers for long periods of time (and were backed by apartheid laws), and were not responsive to changes in the prices of wage goods. Indeed, it is more likely that such a general price increase would result in an increase of wages in *other industries*, while wages in the gold industry remained the same, thereby increasing the differential between the rate of profit in the gold industry and elsewhere, rather than reducing it. The last remaining way in which a general price increase could increase the price of inputs to the gold industry would be an increase in the price of auxiliary materials (e.g. explosives, fuel and stores). However, given all the above, it seem very unlikely that an increase in the price of these auxiliary materials could be large enough to equalize the rate of profit in the gold industry. It seems much more likely that the monopoly ownership of gold would not allow an inflow of capital in the first place, and even if gold production were somehow increased, this increase would either have no effect on the general price level (as in Marx's theory), or would have only a very small effect on the price level, or an increase in the price level would not significantly affect the price of inputs in the gold industry, and hence not affect the rate of profit. Therefore, even if it is assumed that an increase in the quantity of gold currently produced leads to an increase in the general price level, this general price increase is not likely to increase the prices of the inputs to gold production, and thus is not likely to equalize the rate of profit in the gold industry with the general rate of profit.

Furthermore, even if the rate of profit in the gold industry were somehow equalized with other industries by means of capital flows, etc. over successive periods, there would *still be no sharing of surplus-value* between the gold industry *within a single period transformation* of values into prices of production (which analyzes the end result of such a multi-period equalization process). Over successive periods, constant capital and variable capital in the gold industry might change in such a way as to equalize the rate

of profit, but the only way this could happen (assuming equal rates of surplus-value) would be if the composition of capital in the gold industry converged to the average composition of capital. In this case, the magnitudes of constant capital and variable capital would still be *the same* for the determination of both the surplus-value produced and the profit received in the gold industry - the actual quantity of money-capital advanced to purchase means of production and labor-power in the gold industry. Therefore, the profit received would still be identically equal to the surplus-value produced in the gold industry in this single period transformation. From which it follows that the conclusions reached above in Sections 1.5 and 1.6 - that the distribution of surplus-value in the gold industry does not affect the prices of other commodities, and thus that the total price of commodities is always identically equal to the total value of commodities - would still be valid, even if the rate of profit in the gold industry were somehow equalized.

Finally, if the assumption of equal rates of surplus-value is dropped, then the rate of profit in the gold industry might be equalized is through an *unequal* rate of surplus-value, especially in the case of a lower than average rate of profit. In this case, the rate of profit in the gold industry might be increased by a higher than average rate of surplus-value, i.e. by lower than average wages.<sup>12</sup> In this case as well, the conclusions reached in previous sections - no sharing of surplus-value within a single period transformation of values into prices of production, etc. - *would still remain valid*. The lower than average wages would be the same in the determination of both surplus-value and profit in the gold industry, and thus surplus-value and profit in the gold industry would continue to be identically equal.

## 2. Bortkeiwicz and Sweezy's misinterpretation of money in Marx's theory

The rest of the paper critically examines Bortkeiwicz and Sweezy's interpretation of the role of money in the transformation problem in Marx's theory. The first point to make is that Bortkeiwicz and Sweezy do not discuss at all Marx's basic theory of money presented in Part 1 of Volume 1 of *Capital*. Sweezy explicitly acknowledges that his book does not include Marx's theory of money:

Price, as Marx uses the term in Volume 1 of *Capital*, is merely the money expression of value. As such, its analysis belongs to the theory of money, which we shall not attempt to present in this work. (p. 34)

Without a clear understanding of Marx's basic theory of money, Bortkeiwicz and Sweezy make basic mistakes in their interpretation of the role of money in Marx's theory of prices of production in Volume 3. And yet, money turns out to be crucial in their critique of Marx's theory of prices of production!

In general, Bortkeiwicz and Sweezy do not understand the uniqueness of the money commodity in Marx's theory and treat the money commodity just like all other commodities. This is their fundamental mistake. It is assumed that the money commodity has both a value-price and a price of production, just like all other commodities, contrary to Marx's theory. It is also assumed that the rate of profit is equalized in the gold industry, just like all other industries, again contrary to Marx's theory. It is also assumed, in their single period transformation of values into prices of production, that the rate of profit is equalized through a sharing of surplus-value, just like all other industries. The following subsections examine each these mistakes in turn.

It should be noted at the outset that the Bortkeiwicz-Sweezy theory of prices of production is fundamentally different from Marx's theory of prices of production, in the following important respects (please see Moseley 1993, 2000, and 2004, for a further discussion of these differences). In Marx's theory of prices of production, the givens are: (1) the actual quantities of money constant capital and variable capital advanced to

purchase means of production and labor-power and consumed in the production of commodities; and (2) the general rate of profit, which is equal to the ratio of the total surplus-value (as determined in Volume 1) to the total capital advanced (which is taken as given). On the other hand, in the Bortkeiwicz- Sweezy theory of prices of production: (1) the initial givens are hypothetical quantities of constant capital and variable capital (proportional to the labor-times embodied in the means of production and means of subsistence), rather than the actual quantities of constant capital and variable capital; and (2) the general rate of profit is not determined prior to prices of production by the Volume 1 theory of the total surplus-value, but are instead determined simultaneously with prices of production. Because these two theories are so fundamentally different, the conclusions derived from the Bortkeiwicz-Sweezy theory of prices of production *do not apply to Marx's theory* of prices of production.

In addition, Bortkeiwicz and Sweezy present the determination of prices of production in terms of *reproduction schemes*, which is also contrary to Marx's theory.<sup>13</sup> Marx did not present his theory of prices of production in terms of the reproduction schemes, but rather in terms of five industries, which were not grouped into departments. The purpose of Marx's reproduction schemes in Part 2 of Volume 3 has nothing to do with the determination of prices of production, but rather is to explain the replacement of the constant capital portion of the price of commodities, and the critique of what Marx called "Smith's dogma", according to which the constant capital component of the price of commodities disappears at the aggregate level (i.e. the aggregate price is entirely resolved into wages plus profit plus rent, with no component for constant capital (see Moseley 1998 for a further discussion of Marx's reproduction schemes).

Furthermore, Bortkeiwicz and Sweezy add a *third department* to their reproduction schemes (Marx's reproduction schemes only have two departments), which consists of *capitalist consumption goods* and also, in the same department, the *money commodity* (e.g. gold). The units of measurement of capitalist consumption goods are

adjusted so that they all exchange with one unit of gold, i.e. that the value-price of all capitalist consumption goods = 1 unit of gold. Thus the actual value-price of capitalist consumption goods, with their actual units of measurement, are not explained by the Bortkeiwicz-Sweezy interpretation. Also, including both the money commodity and capitalist consumption goods in the same department implicitly assumes that the gold industry and these industries which produce capitalist consumption goods have the same composition of capital.

## 2.1 Money has no price of production

As a commodity produced in Department III, Bortkeiwicz-Sweezy assume that the money commodity (e.g. gold) has both a value-price and a price of production that equalizes the rate of profit, just like all other commodities. The unit of measurement of the value-price of gold is a definite quantity of gold (e.g. one ounce of gold), just like the value-price of all other commodities. Thus, the value-price of 200 ounces of gold is - 200 ounces of gold! But this makes no sense, from the point of view of Marx's theory. The price of gold cannot be a quantity of gold, because, according to Marx's theory, price is the measure of value for commodities, and the value of gold cannot be measured or expressed in terms of gold itself. The value of gold can only be measured or expressed in terms of some other commodity. Therefore, the Bortkeiwicz-Sweezy interpretation starts off with a fundamentally incorrect concept of the "price" of gold in terms of gold itself.<sup>14</sup>

Similarly, in the Bortkeiwicz-Sweezy interpretation, gold also has a "price of production", whose unit of measurement is also a definite quantity of gold, but whose magnitude *could be different* from the value-price of gold. But how is this possible? How is it possible for the price of production of 200 ounces of gold be different from 200 ounces of gold? According to Bortkeiwicz and Sweezy, by changing the unit of measurement for the price of production of gold! For example, if the unit of measurement

were 1/2 ounce of gold, then the price of production of 200 ounces of gold would be **400 1/2** ounces of gold. The magnitudes of the value-price and the price of production of 200 ounces of gold would be different, because the same 200 ounces of gold would be measured in different units. (Bortkeiwicz 1907a, p. 12 and 1907b, p. 202; Sweezy, p. 117)

Such a conception of the “price of production” of gold is obviously totally foreign to Marx’s theory of prices of production. In Marx’s theory, the unit of measurement for both the value-price and the price of production of commodities is the same - a definite, given quantity of gold, e.g. 1 ounce of gold. Furthermore, such a conception of the price of production of gold also has no significance in reality. Even though the magnitude of Bortkeiwicz and Sweezy’s price of production of gold is different from the value-price of gold, the value-product of the gold industry - the quantity of gold produced ( $\mathbf{M}_G$ ) - remains exactly the same and cannot change (200 ounces of gold), as Marx emphasized. This actual 200 ounces of gold is what matters in the real capitalist economy. This magnitude of gold is compared with the initial money capital advanced in the gold industry ( $\mathbf{M}_G$ ) in order to determine the surplus-value produced in the gold industry ( $\mathbf{S}_G = \Delta \mathbf{M}_G$ ) and to determine the profit received in the gold industry ( $\Delta_G = \Delta \mathbf{M}_G$ ). Bortkeiwicz’s invention of something called a “price of production” of gold, that could be measured in different units from the price of gold, has no significance whatsoever for the determination of the actual surplus-value produced and the actual profit received in the gold industry.

This bizarre assumption (that the units of measurement are different for value-prices and prices of production) is necessary, according to the Bortkeiwicz-Sweezy interpretation, if one wants the total “price of production” to be equal to the total “value-price”. However, this assumption also leads to the conclusion, according to their logic, that total profit is not equal to total surplus-value, because the given quantity of surplus gold produced, which represents surplus-value, will now be measured in a different unit.

On the other hand, if one assumes that the unit of measurement is the same for both value-prices and prices of production, then, according to their logic, the opposite conclusions follow: total profit will equal total surplus-value, but total value-price will not equal total price of production.<sup>15</sup> This latter case is the assumption made by Bortkiewicz and Sweezy. We will return to this point below.

## **2.2 No tendency for rate of profit to be equalized in the gold industry**

The second mistake in Bortkiewicz and Sweezy's interpretation of money and the transformation problem is that they assume that the rate of profit is equalized in the gold industry, just as in all other industries. The "price of production" of gold is assumed to be equal to the costs of production plus the general rate of profit times the capital advanced, as for all other commodities. Bortkiewicz and Sweezy do not explain the actual process through which the rate of profit is equalized in the gold industry; they just assume that it is obvious that the rate of profit is equalized, as in all other industries.

But it is not obvious; indeed it is wrong, according to Marx's theory. We have seen above that, according to Marx's theory, there is no tendency for the rate of profit to be equalized in the gold industry, for two main reasons: (1) because gold is a privately owned, scarce natural resource, with a lower than average composition of capital, which means that the higher rate of profit in the gold industry does not result in an inflow of capital, but rather results in absolute rent for the owners of the gold mines; and more fundamentally (2) because gold is the money commodity, which means that the quantity of money in circulation is not determined by the equalization of the profit rate in the gold industry, but is instead determined by the "needs of circulation", i.e. by the sum of the prices of all other commodities. If there were capital transfers in or out of the gold industry, due to unequal rates of profit, which resulted in changes in the quantity of gold currently produced, these changes would be offset by changes in the velocity of money and/or increases or decreases in the quantity of money in hoards, so that the total money

in circulation would remain the same. The prices of all other commodities, including the prices of the inputs to gold production, would also remain the same, and hence the rate of profit in the gold industry would also remain the same. In other words, there is no tendency for the rate of profit to be equalized in the gold industry, because of the special characteristics of the money commodity.

### **2.3 No sharing of surplus-value**

Since there is no tendency for the rate of profit to be equalized in the gold industry, it is not appropriate to assume equal rates of profit in a single period transformation of value-prices into prices of production, as Bortkiewicz and Sweezy do. Bortkiewicz and Sweezy assume that the rate of profit is equalized through the *sharing of surplus-value* between the gold industry and all other industries. As a result of this sharing of surplus-value, the profit received in the gold industry is (in general) *not equal* to the surplus-value produced in the gold industry. More specifically, Bortkiewicz and Sweezy assume that the gold industry has a lower than average composition of capital, and thus has a higher than average “value” rate of profit. Hence, in the equalization of the profit rate, some of the surplus-value (supposedly) produced in the gold industry is transferred to other industries with a higher composition of capital.

The mechanism through which this sharing of surplus-value between the gold industry and other industries is supposed to happen, according to Bortkiewicz-Sweezy, is that the *inputs* of constant capital and variable capital *change*, i.e. these inputs are different in the determination of prices of production than they are in the determination of value-prices. Since Bortkiewicz and Sweezy assume that the “price of production” of gold is equal to the “value-price” of gold, surplus-value cannot be shared between the gold industry and other industries through a change from the “value-price” to a different “price of production” of gold.

In the Volume 1 theory of value and surplus-value, constant capital and variable capital in the gold industry (and elsewhere) are assumed to be equal to the *value-prices* of the means of production and means of subsistence, respectively. Thus we can see that, according to this interpretation, constant capital and variable capital in Volume 1 are *not* equal to the *actual* quantities of money-capital advanced to purchase means of production and labor-power in the gold industry, but are instead to these *hypothetical* quantities of money-capital, that are equal to the value-prices of the means of production and means of subsistence ( $C_G^*$  and  $V_G^*$ , where the superscript \* indicates these hypothetical quantities of money-capital equal to value-prices).

Furthermore, since constant capital and variable capital in the gold industry are hypothetical quantities, so is the surplus-value in the gold industry that is determined by these hypothetical quantities, according to this interpretation. Surplus-value in the gold industry is determined by subtracting these hypothetical quantities of constant capital and variable capital from the value-price of gold, which is equal to the actual quantity of gold produced ( $M_G'$ ). Algebraically:

$$(3) \quad S_G^* = M_G' - M_G^* \quad \text{where } M_G^* = C_G^* + V_G^*$$

Thus we can see clearly that  $S_G^*$  is a hypothetical quantity of surplus-value because  $M_G^*$  is a hypothetical quantity of initial money-capital advanced.

In the Volume 3 theory of prices of production, according to this interpretation, the inputs of constant capital and variable are *redetermined* as equal to the *price of production* of the given quantities of means of production and means of subsistence, which are in general *not* equal to the value-prices of these goods. These revised quantities of constant capital and variable capital are still not the *actual* quantities of money-capital advanced to purchase means of production and labor-power in the gold industry, because these revised quantities are derived on the assumption of the equalization of the profit rate in the gold industry, and this is a false assumption. Therefore, these revised quantities of C and V are still *hypothetical* quantities ( $C_G^{**}$  and  $V_G^{**}$ ), but they are

*different* hypothetical quantities from constant capital and variable capital in Volume 1 (i.e.  $C_G^{**} \neq C_G^*$ ,  $V_G^{**} \neq V_G^*$ , and  $M_G^{**} \neq M_G^*$ , where the superscript \*\* indicates this second set of hypothetical quantities, equal to the prices of production of the means of production and means of subsistence). In Bortkiewicz and Sweezy's famous numerical example,  $C_G^* = 50$ ,  $C_G^{**} = 64$ ,  $V_G^* = 90$ , and  $V_G^{**} = 96$ .

Again, since the inputs of constant capital and variable in the gold industry are hypothetical quantities, so is the profit received in the gold industry that is determined by these hypothetical inputs, according to this interpretation. The "profit" received in the gold industry ( $\square_G^{**}$ ) is equal to the difference between the "price of production" of gold, which is equal to the actual quantity of gold produced ( $M_G'$ ), and the second set of hypothetical quantities of constant capital and variable capital just discussed, that are equal to the "price of production" of the means of production and means of subsistence ( $M_G^{**}$ ); i.e.

$$(4) \quad \square_G^{**} = M_G' - M_G^{**}$$

Thus we can see clearly that, since  $M_G^{**}$  is a hypothetical quantity, so is  $\square_G^{**}$ .

Furthermore, since  $M_G^{**} \neq M_G^*$ , it follows from equations (3) and (4) that  $\square_G^{**} \neq S_G^*$ . In other words, *the profit received in the gold industry is not equal to the surplus-value produced* in the gold industry, according to this interpretation. There is "sharing" of hypothetical quantities of surplus-value between the gold industry and other industries, because the inputs of constant capital and variable capital change. Bortkiewicz and Sweezy assume that the composition of capital in the gold industry is below the social average, and thus has a higher than average rate of profit. Therefore, in order to equalize the profit rate, some of the surplus-value (supposedly) produced in the gold industry is transferred to other industries with a higher composition of capital. In Bortkiewicz and Sweezy's numerical example,  $S_G^* = 60$  and  $\square_G^{**} = 40$ .

All this is clearly contrary to Marx's theory. We have seen above that, in Marx's theory, the inputs of constant capital and variable capital *do not change* in the

transformation of values into prices of production. Instead, the quantities of constant capital and variable capital are *taken as given*, and furthermore the *same quantities* of constant capital and variable capital are taken as given in the determination of both the surplus-value produced in the gold industry and the profit received in the gold industry - the *actual* quantities of money-capital advanced to purchase means of production and labor-power in the gold industry ( $\mathbf{M}_G$ ).

We have also seen above that the value-product of the gold industry is also the same in the determination of both the surplus-value produced in the gold industry and the profit received in the gold industry - the actual quantity of gold produced ( $\mathbf{M}_G'$ ).

Therefore, it follows, as we have seen above, that the surplus-value produced in the gold industry is *always identically equal* to the profit received in the gold industry; i.e.  $\square_G = \mathbf{S}_G = \mathbf{M}_G' - \mathbf{M}_G$ . According to Marx's theory, there is *no "sharing"* of the surplus-value between the gold industry and other industries in the single period transformation of values into prices of production. The surplus-value produced in the gold industry within a given period is the actual quantity of surplus gold produced, which cannot change into a different quantity through the sharing of surplus-value with other industries. It is not a hypothetical quantity of surplus-value ( $\mathbf{S}_G^*$ ) which changes into a different hypothetical quantity of profit ( $\square_G^{**}$ ), as in the Bortkiewicz-Sweezy interpretation.

#### **2.4 Total price of production = total value-price**

We can now understand why Bortkiewicz and Sweezy reach the erroneous conclusion that the total price of production of commodities is greater than the total value-price of commodities. As we have seen, Bortkiewicz and Sweezy assume that the composition of capital in the gold industry is below average, and thus the "value" rate of profit in the gold industry is above average. According to their interpretation, in order to equalize the rate of profit in the gold industry, surplus-value is transferred from the gold industry to all other industries (with a higher composition of capital). This transfer of

surplus-value from the gold industry to other industries is accomplished by means of an increase in the prices of these other commodities. Therefore, the total price of production of commodities is greater than the total value-price of commodities, because of this alleged transfer of surplus-value from the gold industry to other industries.

Bortkiewicz asserts:

Without paying the slightest regard to the conditions of production of the good serving to measure value and price, Marx simply asserts in general terms that total price = total value. This assertion is not only unproven, it is false. (p. XX)

In response, I would say, that without paying the slightest regard to Marx's theory of money and to the uniqueness of money in Marx's theory, Bortkiewicz simply asserts that the money commodity (e.g. gold) is like all other commodities in that surplus-value is shared between the gold industry and all other industries in order to equalize the rates of profit. However, this assertion is not only unproven, it is false. We have seen above that, according to Marx's theory, there is no sharing between the gold industry and all other industries. Surplus-value in the gold industry is a definite quantity of actual surplus gold produced, which has neither a value-price nor a price of production, and which therefore cannot be shared with other industries. Therefore, there can be no change in the prices of production of other commodities as a result of this non-existent transfer of surplus-value in the gold industry.

Therefore, we can see that Bortkiewicz and Sweezy's conclusion that the total price of production of commodities is greater than the total value-price of commodities *does not apply to Marx's theory*, but instead applies only to Bortkiewicz and Sweezy's misinterpretation of Marx's theory. According to Marx's own logic, the total price of production of commodities is always equal to the total value-price of commodities, and the total profit is always equal to the total surplus-value, as we have seen above. Neither of these two aggregate equalities is affected by the sharing of surplus-value in the gold

industry, because, as we have seen, there is no such sharing of surplus-value in the gold industry. Both of these two aggregate equalities are always true, by the nature of Marx's logical method. They are not conditional equalities which may or may not be true, depending on the composition of capital in the gold industry, or the units of measurement for value-prices and prices of production.

## **Conclusion**

I conclude that the Bortkiewicz-Sweezy interpretation of Marx's theory of the role of money in the transformation problem is a complete and fundamental misunderstanding. In the first place, the money commodity (e.g. gold) has neither a value-price nor a price of production, and thus these two cannot be different magnitudes. Secondly, there is no tendency for the rate of profit to be equalized in the gold industry over time, both because gold is a privately-owned, scarce natural resource (so that the extra surplus-value produced in the gold industry is appropriated by the owners of the gold mines as their absolute rent), and, most fundamentally, because gold is the money commodity, whose total quantity in circulation is determined by the "needs of circulation", not by the equalization of the profit rate in the gold industry. Thirdly, in a single-period transformation of value-prices into prices of production, there is no sharing of surplus-value between the gold industry and other industries, because the surplus-value in the gold industry is the actual quantity of surplus gold produced, whose magnitude cannot change by sharing surplus-value with other industries. Finally, since there is no sharing of surplus-value in the gold industry, the prices of production of all other commodities cannot possibly be affected by a non-existent sharing of surplus-value in the gold industry. The total value-price of commodities is always identically equal to the total price of production of commodities, as Marx argued.



## APPENDIX:

### NON-COMMODITY MONEY AND THE TRANSFORMATION PROBLEM

My paper assumes commodity money throughout, as did Marx and Bortkiewicz-Sweezy. However, I argue that Marx's theory *does not require that money be a commodity*. Instead, what is required in Marx's theory is that there be some *expression of abstract labor* (i.e. a measure of value) that satisfies the following conditions: it must be (1) *observable*, (2) *homogeneous*, (3) *quantitative*, and (4) *socially valid* (i.e. generally accepted by all commodity owners).

At the high level of abstraction of *Capital*, money has to be a commodity, because *Capital* presents a theory of a "pure" capitalist economy, without state intervention. And in the 19th century laissez-faire capitalism (without state intervention) that Marx was analyzing, money was a commodity and money had to be a commodity in its functions of measure of value and store of value. However, in the post-1973 contemporary capitalism, money is no longer a commodity (i.e. is no longer convertible into gold at a fixed exchange rate), and money does not have to be a commodity in Marx's theory. The state-guaranteed fiat money serves the same purpose as gold under the gold standard - it provides an *observable, homogeneous, quantitative, and socially valid* expression of abstract labor. The quantity of fiat money that represents an hour of abstract labor (**m**) (i.e. the "monetary expression of labor") is no longer determined by the labor-time required to produce a unit of gold, but is instead determined by the ratio of the total money in circulation (**M**) (adjusted for velocity) to the total abstract labor to be represented (**L**); i.e.  $\mathbf{m} = \mathbf{M} \mathbf{V} / \mathbf{L}$ . But abstract labor is still adequately represented by fiat money, as it was with commodity money.

What are the implications of non-commodity money for the transformation problem? Strikingly, the Bortkiewicz-Sweezy problem disappears altogether. Bortkiewicz-Sweezy's critique was that the equalization of the profit rate in the gold

industry affects the total prices of commodities, and in general makes total prices of production total value-prices. However, with non-commodity fiat money, prices are no longer exchange-values with the commodity gold. Therefore, the equalization of the profit rate in the gold industry (if there is an equalization, now that gold is no longer money) could not affect the prices of commodities, and thus could not affect the total price of commodities, which continues to be identically equal to the total value-price of commodities.

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## ENDNOTES

1. Suzanne de Brunhoff (1973, p. 69-71) also criticized Sweezy for his failure to consider Marx's basic theory of money in his interpretation of Marx's theory prices of production.

2. Williams 1975, p. 23, and Yaffe 1976, p. 35, also emphasize this point.

3. The references to Marx's works in this paper utilize the following shorthand notation:

C.I.	<i>Capital</i> , Volume 1.
C.II.	<i>Capital</i> , Volume 2.
C.III.	<i>Capital</i> , Volume 3.
Cr.	<i>A Contribution to the Critique of Political Economy</i>
G.	<i>The Grundrisse</i>
MECW.30.	<i>Marx-Engels, Collected Works</i> , Volume 30.
MECW.31.	<i>Marx-Engels, Collected Works</i> , Volume 31.
MECW.32.	<i>Marx-Engels, Collected Works</i> , Volume 34.
MECW.33.	<i>Marx-Engels, Collected Works</i> , Volume 33.
TSV.II.	<i>Theories of Surplus-value</i> , Volume 2.
TSV.III.	<i>Theories of Surplus-value</i> , Volume 3.

4. Howell 1975, p. 53, also emphasizes this unique form of the circulation in the gold industry.

5. Very briefly, I argue that, in Marx's theory of surplus-value in Volume 1, the initial money (**M**) is *taken as given*, as the *actual* quantities of money-capital advanced to purchase means of production and labor-power in the real capitalist economy. The main aim of Marx's theory of surplus-value in Volume 1 is to explain the *actual* total surplus-value, not to explain a hypothetical total surplus-value, that is proportional to the labor embodied in surplus goods, and that must later be transformed into the actual total surplus-value, as in the standard interpretation of Marx's theory. In order to explain the actual total surplus-value, the determinants must be the actual quantities of money-capital advanced to purchase means of production and labor-power in the real capitalist economy, not hypothetical quantities of money-capital proportional to the labor-times embodied in the means of production and means of subsistence.

However, the actual quantities of constant capital and variable capital cannot be determined in Volume 1, because these actual quantities of constant capital and variable capital are identically equal to the *prices of production* of the means of production and means of subsistence, respectively, and prices of production cannot be determined in Volume 1. According to Marx's logical method, the prices of production of commodities

are determined by the equalization of profit rates across industries, and the equalization of profit rates cannot be explained until after the total amount of surplus-value is determined, which is the task of Volume 1. Therefore, the actual quantities of constant capital and variable capital that are equal to the actual prices of production of the means of production and means of subsistence cannot be determined in Volume 1. Since these actual quantities of constant capital and variable capital advanced cannot be determined in Volume 1, they are *taken as given* in the theory of surplus-value in Volume 1. These actual quantities of constant capital and variable capital are explained later, after prices of production have been determined in Volume 3. Please see Moseley 2004 for the most recent and complete discussion of this point.

6. Howell 1975 also emphasizes that “the surplus-value contained in gold appears immediately in socially recognizable form.” (p.53)

7. At a more concrete level of abstraction, the money commodity has a “price” in terms of national currencies. However, this currency price of gold is fixed over long periods of time. Therefore, the same point applies - the currency price of gold cannot be changed from a “value-price” to a “price of production”.

8. Very briefly, I argue that the initial money-capital is taken as given in both of these stages of the theory, and, moreover, that the *same quantities* of money-capital are taken as given in both the theory of value and surplus-value in Volume 1 and the theory of prices of production in Volume 3 - the *actual* quantities of money-capital advanced to purchase means of production and labor-power in the real capitalist economy. The only difference is that, in Volume 3, not only are the aggregate quantities of constant capital and variable capital taken as given, but also the disaggregated quantities of these two components of the initial money-capital in each industry (the sum of the latter is by definition equal to the former). This is the reason why constant capital and variable capital *do not change*, or *do not have to be transformed*, in the transition from the theory of the total surplus-value in Volume 1 to the theory of prices of production in Volume 3: because *the same quantities* of constant capital and variable capital are taken as given in both of these stages of the analysis - the actual quantities of money-capital advanced in the real capitalist economy.

It follows that *Marx did not fail to transform the inputs* of constant capital and variable capital from values to prices of production, because the *same quantities* of constant capital and variable capital are *taken as given* in the determination of both values and prices of production. It also follows that both of Marx’s two aggregate equalities (total price of production = total value-price and total profit = total surplus-value) are always identically true by definition. Please see the papers referred to in the text for a demonstration of this important conclusion.

9. On the South African gold mining industry, which accounted for over half of the world gold production in the 20th century, see Wilson, 1972, Williams 1975, and Innes 1984.

10. Similar interpretations of Marx's theory of a higher than average rate of profit in the gold industry have been presented by Williams 1975 and Naples 1996.

11. Itoh argues that new discoveries will make possible an increase in the supply of gold in spite of the resistance of existing landlords. However, new discoveries are rare, and should not be considered the general case. In addition, even if there are new discoveries, which increases the supply of currently produced gold, the prices of all other commodities still would not change for a more fundamental reason discussed in the following paragraphs.

12. In his exhaustive study of the history of the South African gold mining industry, Innes (1984, Chapter 2) emphasizes that, in the beginning (the 1890s), the rapid expansion of this large-scale, labor-intensive industry resulted in a shortage of labor, which drove wages up significantly. Because the currency price of gold was fixed, the gold capitalists could not pass on the higher wages in the form of higher prices. Therefore profits fell significantly, and the viability of the industry was threatened. The solution of the gold capitalists to this fundamental problem was the system of apartheid which guaranteed a sufficient supply of labor and sufficiently low wages.

13. Yaffe 1976, pp. 35 and 42-43; and de Brunhoff 1973, pp. 69-71 also criticize Bortkeiwicz and Sweezy on this point.

14. Yaffe (1976, pp. 35-37) and deBrunhoff (pp. 69-71) have also criticized Bortkiewicz and Sweezy for their failure to understand that the money commodity has no price. De Brunhoff said: "If money is treated as a unit of account possessing a price, it loses its specificity." (p. 71)

15. The conclusion that total profit = total surplus-value also requires the additional assumption that the composition of capital in the gold industry is equal to the composition of capital in capitalist consumption industries. If the composition of capital in the capitalist consumption industries is not equal to the composition of capital in the gold industry, then one would need separate departments for gold and capitalist consumption goods, and in general the total price of production of capitalist consumption goods would not be equal to the total value of capitalist consumption goods; which implies that total profit would not be equal to total surplus-value.