Int. Journal of Political Economy, vol. 28, no. 4, Winter 1998–99, pp. 55–81.

ISSN 0891–1916 / $9.50 + 0.00.

ALEJANDRO RAMOS M.

Value and Price of Production: New Evidence on Marx's Transformation Procedure

> *Was zahlen Sie für einen Rat, wie man sein Geld anlegt mit Nutzen? Hast du Geld, la es nicht bei dir im Sack, geh' zu den Menschen und säe es aus. Das ist ein Acker, der düngt sich mit Blut, da wächst etwas, da kommt etwas heraus, das produziert die Krone des Gewinns.*
>
> Georg Kaiser, *Der Silbersee*

The central purpose of this article is to highlight a passage of the recently published Main Manuscript of *Capital,* vol. III[1] that was not included in Engels' edition of this book. It is scarcely mentioned in the literature that Marx develops *two* examples of the transformation procedure in what became chapter 9 of the third volume. Ever since Bortkiewicz published his famous articles on the "transformation problem," Marx's commentators have focused only on the *first* example given in that chapter, because it seemed compatible with that interpretation, the *second* example being almost universally neglected. The missing text, which is a fundamental piece in the explanation of the transformation procedure, pertains to this second example and Engels' omission probably contributed to the subse-

The author thanks Marcela Clavijo, Paul Cockshott, Allin Cottrell, John Ernst, Duncan Foley, Alan Freeman, Paolo Giussani, Rolf Hecker, Andrew Kliman, Chai-on Lee, Fred Moseley, Bruce Roberts, Adolfo Rodríguez, Alfredo Saad-Filho, and Michael Williams for helpful discussions. None of these people is responsible for the opinions presented in this work. This article is dedicated to Graciela.

quent confusion regarding the transformation. This article begins by considering the *first example* of the transformation presented in chapter 9 and its connection with the interpretation proposed by Bortkiewicz and his many followers. I shall show that Bortkiewicz substantially altered the textual evidence in order to "adjust" it to his own interpretation. The next section systematically reconstructs the *second example*, focusing initially on the text omitted by Engels. The new evidence contained in the missing passage supports the interpretation of the transformation given by some authors since the 1980s[2] and shows that Marx's procedure is logically consistent. The third section provides a numerical illustration of the *second example* of the transformation procedure in both static and dynamic situations.

The "first example" in chapter 9 and Bortkiewicz's interpretation of the transformation

The extensive literature on the "transformation problem" has not examined the whole of the textual evidence regarding this aspect of Marx's theory.[3] The dominant interpretation—proposed by Tugan-Baranowsky-Baranowsky and Bortkiewicz at the beginning of this century[4]—consists mainly of a possible interpretation of *one* of the two examples presented in what Engels published as chapter 9 of volume III. In this chapter, however, there are *two* illustrations of the transformation procedure,[5] not only one as most of the literature implicitly suggests. Certainly, if both examples had exactly the same features, this would be irrelevant for understanding of Marx's presentation. Yet this is not the case.

The core of the *first example* of the transformation procedure in chapter 9 is a set of two tables widely reproduced, *with important modifications*, by Marx's commentators (shown here as Table 1).[6] Since Bortkiewicz's time, these tables have been interpreted in the following way: Each table corresponds to a set of simultaneous equations, the first being a "system of values" and the second a "system of production prices." In the "system of values," the "value" of commodity j (λ_j) is defined as the sum of the *value* of the used up means of production (c^{λ}_{ij}) + the *value* of the means of subsistence (v^{λ}_{ij}) + surplus value (m_j), that is, as the sum of the "cost price in value terms" + surplus value, $\lambda_j = (c^{\lambda}_{i} + v^{\lambda}_{i}) + m_j = K^{\lambda}_{ij} + m_j$.[7] It is thus claimed that this is the definition of value in the first table; for ex-

Table 1

	Capital	Rate of surplus value	Surplus value	Rate of profit	Used up c	Value of commodities	Cost price
I.	$80_c + 20_v$	100%	20	20%	50	90	70
II.	$70_c + 30_v$	100%	30	30%	51	111	81
III.	$60_c + 40_v$	100%	40	40%	51	131	91
IV.	$85_c + 15_v$	100%	15	15%	40	70	55
V.	$95_c + 5_v$	100%	5	5%	10	20	15
Total	$390_c + 110_v$	—	110	—	—	—	—
Average	$78_c + 22_v$	—	22	22%	—	—	—

	Capital	Surplus value	Value of commodities	Cost price of commodities	Price of commodities	Rate of profit	Divergence of price from value
I.	$80_c + 20_v$	20	90	70	92	22%	+2
II.	$70_c + 30_v$	30	111	81	103	22%	–8
III.	$60_c + 40_v$	40	131	91	113	22%	–18
IV.	$85_c + 15_v$	15	70	55	77	22%	+7
V.	$95_c + 5_v$	5	20	15	37	22%	+17

ample, the value of commodities produced in sphere I would be $(50_c + 20_v) + 20_m = 90$. On the other hand, it is maintained that Marx calculated the prices of production *incorrectly*, in three steps: First, he obtained the "value rate of profit" as the ratio between total surplus value and total advanced capital "in value terms" in the first table—$110_m/(390_c + 110_v) = 22$ percent; then, he transferred the "cost prices in value" (K^{λ}_{ij}) from the first to the second table *without modifying* them—for example, in sphere I, $50_c + 20_v = 70$; finally, he obtained the prices of production by adding $K^{\lambda}_{i} + p'$, where p' is the "average profit" calculated in accordance with the "value rate of profit," $(50_c + 20_v) + 22_p = 92$.

According to Bortkiewicz, Marx's error would lie in the second step because, when constructing the "system of production prices," he had "made the mistake of carrying over certain magnitudes [the so-called 'cost prices in value terms,' K^{λ}_{ij}] without alteration from the table of values into that of prices" whereas "in transforming values into prices, it is inadmissible to exclude from the recalculation the constant and variable *Capital*, vol. Invested in the various spheres of production."[8] In other words, the procedure imputed to

Marx by Bortkiewicz is incompatible with the correct specification of production price as the sum of the *price* of the means of production + the *price* of the means of subsistence + profit, that is, as the sum of the cost *price* + average profit, $P_j = (c^P_{ij} + v^P_{ij}) + p'_j = K^P_{ij} + p'_j$.[9] According to this interpretation, although "Marx recognized the need to transform input as well as output values into prices of production," he "was unable to extend his analysis to allow him to do so."[10] Thus, Bortkiewicz's "correction" is to specify the "system of prices," in which the elements of the cost price are "transformed" into production prices $P_j = K^P_{ij} + p'_j$, while the "system of values" remains as a set of simultaneous equations in which the value is defined as $l_j = K^\lambda_{ij} + m_j$. The widely known results of this algebraical setting are, first, that neither the "value rate of profit" nor the "system of values" plays any role in the determination of production prices[11] and, second, that "it would ... not be permissible to equate total price with total value whilst simultaneously equating total profit with total surplus value."[12]

Perhaps the main feature of this interpretation is a *dual definition of cost price*. In effect, according to these authors, there would be two "cost prices," the already mentioned "cost price in value terms" (K^λ_{ij}) and "cost price in price terms" (K^P_{ij}). It is interesting to note, first, that this peculiar terminological distinction is not found in Marx's text. He presents "cost price" as a single magnitude for which the chosen words ("cost *price*") clearly indicate that capitalists are purchasing the inputs at their (production) *prices*. So, it is manifest that the term "cost *price* in *value* terms" is awkward in itself and the result of confusing *cost price* and the *value contained in the inputs*. More generally, values and production prices are defined *dualistically* as two completely separate "systems" or "worlds," thus severing the real and conceptual *unity* between them: It is the case neither that value is expressed effectively (although contradictorily) by price nor that price is a manifestation of value. Both magnitudes are conceived, rather, as parallel, *nonrelated*, ideal rules of price formation.[13] The dualistic understanding of the value/price *relation* neglects the relation between value-substance (*Wertsubstanz*) and value-form (*Wertform*), that is, the fact that the substance of value (abstract social labor-time) must appear as money[14] and, at the same time, "money is labor time in the form of a general object, or the objectification of general labor time."[15] As Marx argues, the value/price

relation is actually accomplished by means of *quantitative divergences*,[16] one of which is considered in the transformation of values into production prices.

As has been mentioned, the dualistic authors claim that the definitions of value and price of production proposed by Tugan-Baranowsky and Bortkiewicz are simply an algebraic translation of the two tables of the first example in chapter 9. However, to be plausible, this opinion requires a substantial alteration of the textual evidence presented in that chapter. If—as is alleged—the tables were respectively a "system of values" without prices and a "system of prices" without values, the latter *must not contain columns for surplus value and value*. Yet, Marx's second table does present these columns. This "detail" is never mentioned in the literature because the accepted practice is to cite Bortkiewicz's version of the tables. His version *suppresses* these columns in order to make the example "adequate" to his dualistic conception of the transformation procedure.[17] In addition, it is clear that, without suppressing the columns of surplus value and value, the interpretation of the tables as "separate systems" is not plausible. Instead, Marx's original presentation suggests that the tables are *parts of a single-table* example in which the purported difference between K^{λ}_{ij} and K^{P}_{ij} does not exist. This point of view is substantially buttressed by the "second example" of the transformation procedure, considered in the following section.

The "second example": a nondualistic and sequential illustration of the transformation procedure[18]

In Engels' edition of chapter 9, a few pages after the example altered by Bortkiewicz there is a *second*, different illustration of the transformation procedure.[19] Although this example is just as important as the first, it has remained "invisible" for the many authors who have dealt with the "transformation problem." Comparison of Engels' edition of chapter 9 with the Main Manuscript permits one to establish two main differences: Engels omitted a relevant passage, and he included a numerical example that did not appear in the original. As I shall show, the omission reduced the strength of Marx's presentation, contributing to the consolidation of Bortkiewicz's interpretation. Below, I present Marx's "second example" in five subsections that follow his text step by step.

Value and price of production in a passage omitted by Engels

In the Main Manuscript, the "second example" of the transformation procedure begins with a text included in Engels' edition:

> In Volumes 1 and 2 we were only concerned with the *values* of commodities. Now a part of this value has split away as the *cost price*, on the one hand, while the other, the *production price* of the commodity has also developed, as a transformed form of value.[20]

In the Main Manuscript, immediately after this text,[21] there is a passage omitted in Engels' edition:

> Der *Kostenpreiβ* ist, wie wir sehen, immer kleiner als der *Werth* der Waare. Der *Productionspreiβ* kann *kleiner*, *grösser* oder *gleich* dem Werth der Waare sein. Der Werth der Waare = dem Werth des in der Production der Waare aufgezehrten Capitals plus dem Mehrwerth. Nehmen wir wie in der ursprünglichen Entwicklung des Kostenpreises (*Capitel I*) Kostenpreiβ = Werth des in der Production der Waaren vorgeschossenen Capitals, so haben wir folgende Gleichungen:
>
> | | |
> |---|---|
> | *Werth* = Kostenpreiβ + Mehrwerth. | $W = K + m$. |
> | oder *Profit*, als identisch mit *m.p.* | oder $= K + p$. |
> | *Kostenpreiβ* = Werth – Mehrwerth. | oder $K = W - m$. |
> | *Productionspreiβ* = Kostenpreiβ + Profit, berechnet nach der allgemeinen Profitrate = p'. | $P = K + p'$. |
>
> Da $K = W - m$ und $W = K + m$, ist der Werth der Waare stets > als ihr Kostenpreis.
>
> Je nachdem m oder p jeder besondren Productionssphäre größer oder kleiner oder gleich, > < oder = dem durch die allgemeine Profitrate bestimmten Durchschnittsprofit, wird $P > < = W$.
>
> Da $W = K + m$ oder p, und $P = K + p'$ ist $W = P$, wenn $m = p'$, als P, wenn $p' < m$ und $< P$, wenn $p' > m$.[22]

It is clear that, in this passage, Marx briefly notes that value = cost price + surplus value ($W = K + m$), or, rather, W = cost price + produced profit ($W = K + p$), and that *production price* = cost price + appropriated profit ($P = K + p'$), where *profit* p' is "calculated according to the general rate of profit," and therefore differs from the produced profit, p.[23] The conceptual precision of these equations

(*Gleichungen*) is not found anywhere in the published text of volume III. It is important to note, however, that similar formulations are found scattered in other places of the book. For example:

> If we call the cost price K, the formula $W = c + v + m$ is transformed into the formula $W = K + m$, or commodity value = cost price + surplus value. . . . The capitalist cost price of the commodity is thus quantitatively distinct from its value or its actual cost price; it is smaller than the commodity's value, for since $W = K + m$, $K = W - m$.[24]

The actual tables in which Marx presents his "first example" are also compatible with these equations, whereas Bortkiewicz's tables are not.

Now, then, the passage omitted by Engels allows one to trace how the analysis of the more superficial aspects of capitalist society has *modified* the concept of value. First, *value* is no longer presented as the sum of $c + v + m$ (which reveals its inner rationality) but as $K + p$, cost price + produced *profit*. Surplus value has been *qualitatively* transformed into profit—that is, it is no longer presented as generated by living labor but rather in an outward and mystified form, as produced by the whole advanced capital. However, the produced profit coincides *quantitatively* with surplus value.[25] Second, the sum $c + v$ is also transformed *qualitatively* into an mystified magnitude, *cost price*, in which the distinction between constant and variable capital no longer exists. (In the subsection, "What is cost price K?" it will be shown that, as produced profit p, *cost price* must also be transformed quantitatively.) Finally, *production price* is presented as a *form of value*, which has been transformed only *quantitatively*—that is, it differs from value only in magnitude. It is then clear from Marx's equations that cost price, K, is the same magnitude for both W and P. This is at variance with the definition given by Bortkiewicz and his followers for value and production price, in which, as was shown above, the *cost price* in the "system of values" is different from the *cost price* in the "system of prices" ($K^{\lambda}_{ij} / K^{P}_{ij}$).

The "hidden" table

Following the missing text, there is a passage published by Engels in which Marx describes in words a table illustrating the transformation procedure:

> If we take it that the composition of the average social capital is 80_c + 20_v and the annual rate of surplus value m′ = 100 percent, the average annual profit for a capital of 100 is 20 and the average annual rate of profit is 20 percent. For any cost price K of the commodities annually produced by a capital of 100, their price of production will be $K + 20$. In those spheres of production where the composition of capital is $(80-x)_c$ + $(20 + x)_v$, the surplus value actually created within the sphere, or the annual profit produced, is $20 + x$, i.e., more than 20, and the commodity value produced is $K + 20 + x$, more than $K + 20$, or more than the price of production. In those spheres where the composition of capital is $(80 + x)_c$ + $(20-x)_v$, the surplus value or profit annually created is $20-x$, i.e., less than 20, and the commodity value therefore $K + 20-x$, i.e., less than the price of production, which is $K + 20$. Leaving aside any variation in turnover time, the production prices of commodities would be equal to their values only in cases where the composition of capital was by chance precisely $80_c + 20_v$.[26]

The "hidden table," comprised of three spheres of average, low and high composition, may be easily written down (Table 2). This table is directly connected to, and consistent with, the value and production price equations that Engels omitted. Price of production = cost price + average profit and value = cost price + produced profit; there are not two cost prices, one for the "system of values" and another for the "system of prices," but only one, common, magnitude for both values and production prices. In fact, the "hidden table" is simply a semi-algebraic illustration of the preceding formulation, given that the composition of average capital is 80_c + 20_v, the rate of surplus value equals 100 percent, and fixed capital is not employed. This connection between Marx's equations and their subsequent illustration was lost in Engels' edition. It is important to note that this presentation involves a *single* table, thus differing both from the "first example," in which there are two *seemingly* separate tables and, of course, from Bortkiewicz's altered version of it, commonly used as "textual evidence." On the basis of Marx's equations and the single table, the "double equality" (Σ values = Σ prices of production and Σ surplus values = Σ profits) is easily obtained. Values and production prices differ only because surplus values differ from profits, since K is the same for both W and P and surplus value is merely redistributed in circulation.

Table 2

Cost price	Profit	Price of production	Surplus value	Value
1. $K = 80_c + 20_v = 100$	20	$K + 20 = 120$	20	$K + 20 = 120$
2. $K = (80 - x)_c + (20+x)_v = 100$	20	$K + 20 = 120$	$20 + x$	$K + 20 + x = 120 + x$
3. $K = (80 + x)_c + (20-x)_v = 100$	20	$K + 20 - x = 120$	$20 - x$	$K + 20 - x = 120 - x$
$\Sigma\ 3K = 240_c + 60_v = 300$	60	$3K + 60 = 360$	60	$3K + 60 = 360$

The arithmetical example—Engels' addition?

Once Marx has constructed the "hidden table," he undertakes the explanation of the composition of capital (C/V). This is a logical step because, assuming a uniform rate of surplus value, the differences between values and production prices are determined by this ratio. The point is summarized in a sentence published by Engels with modifications:

> Wenn $m + n$ constante Grössen = 100, x irgend eine beliebige variable Grösse; wenn die *Zusammensetzung des gesellschaftlichen Durchschinittscapitals* = $C^m\ V^n$, so sind Capitalien von der Form $C^{m+x}\ V^{n-x}$ Capitalien von *höherer*, dagegen Capitalien von der Form $C^{m-x}\ V^{n+x}$ Capitalien von *niedrigerer* organischer Composition.[27]

After this text, Engels' version of chapter 9 includes an arithmetical illustration[28] that does not appear in the Main Manuscript. This example is shown in tabular form in Table 3. Although this illustration is not in the Main Manuscript, it is simply an arithmetical version of the "hidden table" that assumes $x = 10$. Moreover, the same example is found in a letter to Engels, dated April 30, 1868:

> Now this [the *mass of capital belonging to each sphere of production*] seizes a certain part of the total surplus value, in that proportion in which it forms a part of the total social capital is only achieved if the annual output of commodities in each sphere of production (in the above situation where the total capital = $80_C + 20_V$ and the social rate of profit = $20_m/(80_C + 20_V)$ is sold at the *cost price + 20% profit on the invested value of capital* (regardless of the amount the invested fixed capital which enters, or does not enter, the annual cost price). But the *determination* of the price of the commodities must also *diverge* from their *values*. Only in those spheres of production where the percentage composition of capital is $80_C + 20_V$ does the price $_K$ (*cost price*) + 20 percent of the invested

Table 3

	Constant capital	Variable capital	Surplus value	Rate of profit	Price of the product	Value
1.	80	20	20	20%	120	120
2.	90	10	10	20%	120	110
3.	70	30	30	20%	120	130
Σ	240	60	60	20%	360	360

capital coincide with their *value*. Where the composition is higher (e.g., $90_C + 10_V$) this price is *above* their value, where the composition is smaller (e.g., $70_C + 30_V$), *under* their value.

It is clear that, although the example in the version published by Engels is an application of Marx's equations in the Main Manuscript, these equations are no longer presented *explicitly*. As a result, the numerical example lost its conceptual basis and has passed unnoticed, which has made it easier for later theorists to misunderstand the meaning of cost price. Because, moreover, Engels did not publish this illustration as a *table* but as a part of the text, it is widely believed that in chapter 9 there is only one tabular example of the transformation procedure.[29]

What is cost price K?

It has been shown above that, in the passage omitted by Engels as well as in the "hidden table" and in the arithmetic illustration included later, the cost price of a commodity (K) is the same magnitude for both its value (W) and its production price (P). But what is cost price? What is, as Marx also writes in the missing passage, the "value of the advanced capital in the production of commodities"?[30] Does it correspond to the *value* or to the *price of production* of the inputs which the capitalist purchases at the beginning of the circuit? Bortkiewicz's interpretation of the "first example" of chapter 9 is grounded on the belief that K corresponds to the *value* congealed of those commodities. This opinion gave rise to the charge that Marx "completed only *half* the process of transformation" because although he transformed the outputs, left the inputs (i.e., the cost prices) "in value terms."[31] However, the step-by-step reading of the "second example" makes it clear that Marx has *not* left the inputs in "value

terms." In effect, after considering the composition of capital, Marx grappled with the effect of the transformation on the category of cost price. Then, he writes,

> Es ist durch die jetzt gegebne Entwicklung allerdings eine Modification eingetreten in respect to the determination of the cost price of commodities. Ursprünglich angenommen, daß der *Kostpreiß* einer Waare = dem *Werth* der in ihrer Production *consummirten* Waaren. Da aber der *Productionspreiß* einer Waare als Kostpreiß in die Preißbildung einer andren Waare eingeht und da der Productionspreiß abweichen kann vom Werth der Waare, kann also auch der Kostpreiß einer Waare *über* oder *unter* dem *Theile ihres Gesammtwerths* stehn, der durch den Werth der in sie eingehenden Productionsmittel gebildet wird. Es ist nöthig sich dieser modificirten Bedeutung des Kostpreisses zu erinnern und sich daher zu erinnern, daß wenn in einer besondren Productionssphäre der *Kostpreiß* der Waare und der *Werth* der in ihrer Production consummirten Productionsmittel gleichgesetz werden, stets ein *Irrthum* möglich ist. Für unsre gegenwärtige Untersuchung nicht nöthig näher auf diesen Punkt einzugehn.[32]

In this passage—included with modifications by Engels—Marx gives a clear answer regarding the determination of cost price: K does correspond to the *price of production* of the commodities purchased by the capitalists, not to to the *value* they contain: "There is always the possibility of an *error* if, in any particular production sphere, the *cost price* and the value of the consumed means of production are equated." Therefore, K corresponds to the *production price* of inputs. (It is important to note, however, that this refers only to the particular case in which all capitalists obtain the general rate of profit while, in general, K is determined by the *market price* of the inputs.[33] In this article, I am assuming that commodities are exchanged at their prices of production.)

The published version of the above-quoted passage has been frequently cited out of context as a "proof" that Marx "was aware that he had left the inputs in value terms."[34] However, read in connection with the equations for W and P included in the text omitted by Engels, it is clear that Marx is simply stating that *cost price* has undergone a *quantitative* "modification" that should be added to other "modifications" already considered, namely, the transformation of surplus value into profit, the transformation of constant capital + variable capital into cost price and the transformation of value

into price of production (see above). Now, Marx argues, the *cost price* is also "modified" *quantitatively*, not only qualitatively, because it is determined by the prices of production, not by the values, of the inputs. The *value contained* in the inputs, different from *cost price*, can no longer determine the money-value effectively advanced by capitalists, which in its turn enters as a fraction of *both*, W and P, according to Marx's equations.

It is quite possible that the dualistic widespread belief that Marx presents cost price as a magnitude "in value terms" arises from expressions such as "*Kostenpreiβ = Werth des in der Production der Waaren vorgeschossenen Capitals.*"[35] As cost price is defined as "the *value* of advanced capital," it is interpreted that this cost price is a "not transformed" magnitude belonging to a hypothetical "value system." However, this does not take into account three things: first, that, in itself, the category "cost *price*" is a *transformed* magnitude. Second, that, for Marx, it is natural to conceive the advanced capital as an amount of *value* for the simple reason that, although it is quantitatively determined by the (production) price of the inputs, these production prices are only an outward *form of value*; more generally, production prices are only "transformed forms of *value*" and then, in this sense, "value magnitudes." And, third, since, under the assumptions of the second example, K corresponds to the advanced capital, this magnitude is necessarily determined by the prices that the capitalists must actually pay when purchasing the inputs.

The quantitative modification of cost price has an important implication for the determination of the *magnitude of value* of a given commodity, that is, W: The money-value advanced by capitalists no longer corresponds to the *value* crystallized in the inputs, but to their *production price*. Constant capital—that is, the social labor-time transferred by the means of production to the value of commodities—is not the labor-time *objectified* in the means of production but the labor-time *represented by the money that the capitalists advance* at the start of the circuit, determined by their prices of production.[36] In the same way, variable capital is not the value crystallized in wage goods but the labor-time represented by the production price of those commodities.[37] Therefore, the fraction of *value* corresponding to K is given by the production prices of the inputs; in other words, the labor-time socially necessary to produce the *paid* portion of a commodity corresponds to the labor-time rep-

resented by their monetary production prices.[38] As K is also a component of the *production prices*, value and production price differ only because the produced profit (p) is not equal to the average profit (p'); cost price is the same magnitude for both value and production price.

It is important to note, however, that the quantitative "modification" of cost price permits one to rewrite K as follows:

K = value of inputs + δ,

where δ stands for the divergence between the production price and the value of the inputs. Therefore, Marx's equations can be expressed as:

W = [value of inputs + δ] + p;
P = [value of inputs + δ] + p'.

So, although one fraction of both a commodity's value and its production price does correspond to the value materialized in the inputs, it is not this magnitude, but *cost price*, that actually enters into the formation of both W and P. Marx analyzes this divergence *contained* in cost price in a passage edited by Engels in *Capital,* vol. III, chapter 12, Supplementary Remarks:

> Man hat gesehn, wie die *Abweichung der* Productionspreisse *von den* Werthen entspringt
>
> 1. Dadurch, daß zum *Kostenpreiß* einer Waare nicht der in ihr enthaltne *Mehrwert*, sondern der *Durchschnittsprofit* hinzugeschlagen wird;
>
> 2. Daß der so vom Werth abweichende Productionspreiß einer Waare als Element in den Kostenpreiß andrer Waaren eingeht, wodurch also schon im *Kostenpreiß* einer Waare eine Abweichung von dem *Werth* der in ihr consummirten Productionsmittel enthalten sein kann, abgesehn von der Abweichung, die durch die Differenz zwischen Durchschnittsprofit und Mehrwert hereinkommen kann.[39]

So, in point 2, Marx states that K differs from the "value of the means of production consumed," a distinction that, certainly, does not imply that there are two different "cost prices," one "in value terms" and, another, in "price terms," as maintained by the dualistic interpretation. Moreover, after this passage, Marx rewrites the equations presented in the missing paragraph for the case of average-composition commodities:

> Was nun die *Waaren* angeht, die durch Capitalien mittlerer Zusammensetzung producirt werden, so ist es also möglich, daß ihr *Kostenpreiß* abweicht von dem *Werth* dieses Bestandtheils ihres Productionspreisses. . . . Sobald dieß der Fall, ist der von V erzeugte Mehrwerth = dem Durchschnittsprofit. Andrerseits: Weil er gleich dem Durchschnittsprofit ist, ist der Productionspreiß K + p (der Kostenpreiß + dem Profit) = K + m, praktisch dem Werth der Waare gleichgesetz.[40]

Here, again, K appears as a *single* magnitude for both value and production price, corresponding to the production price of inputs. As in the average-composition commodities $m = p$, $W = P$, value = production price. Marx suggests neither the existence of two "cost prices" nor that K corresponds to the value contained in the inputs.

How does value determine production prices?

Since, as has been seen, prices of production (in the general case, *market prices*) enter through cost price into the formation of *values*, it seems that values are determined by production prices, not the opposite. How, then, does value determine production price? The next passage in the "second example" clarifies the process by which production prices are determined by values:

> Dabei bleibt immer der Satz richtig, daß der Kostpreiß der Waaren stets < als ihr Werth. Denn wie auch der *Kostpreiß* der Waare von dem *Werth* der in ihnen consummirten Productionsmittel abweichen mag, für den Capitalisten ist dieser vergangne Irrthum gleichgültig. Der Kostpreiß der Waare ist ihm gegeben, von seiner Production unabhängige Voraussetzung, während es das Resultat seiner Production ist eine Waare zu produciren, die *Mehrwerth* enthält, also einen *Werthüberschuß* über den Kostpreiß seiner Waare. Sonst—practically speaking—hat der Satz daß *Kostenpreiß* < als *Werth* der Waare, sich jetzt in den Satz verwandelt daß *Kostenpreiß* < als Productionspreiß.[41]

In this passage, Marx relates the cost price to the value of commodities, making it clear that both magnitudes are determined in different phases of capital circuit, that is, they are defined *temporally*.[42] Because commodities are not exchanged at their values but at their production prices, a divergence ("error") occurs, but this is a "*past* error" (*vergangner Irrthum*) that is already given at the *beginning* of the capital circuit. So, cost price is a given magnitude, the "premise" (*Voraussetzung*), of the production process, while the commodity

containing a surplus value is the "result" (*Resultat*) obtained at the *end* of the circuit. To elaborate upon this distinction between "premise" and "result," the circuit of capital can be temporally specified as a sequence of *circulation time* (*M–C*), *production time* (. . . *P*. . .) and, again, *circulation time* (*C′–M′*).[43] Let us suppose that there is no fixed capital, that the monetary expression of labor-time[44] is constant, and that the first circulation phase (*M–C*) takes place on January 1, 2000. On this day, capitalists advance money to purchase means of production and labor-power. They are sold at their production prices, determined by a redistribution of the surplus-labor objectified as surplus value over the preceding year. Social labor-time represented by these monetary production prices is thus the "premise" for a new production process (. . . *P* . . .), which spans from January 2 to December 31. At the end of the year, the consumption of the means of production and labor-power has "resulted" in new commodities whose *value* has been *determined during the production process*. When workers' living labor *consumes* the use-value of the means of production, the labor-time represented by their monetary *production prices* (constant capital) is *transferred* to the value of the new commodities. Workers also perform necessary labor, given by the labor-time represented by the monetary production price of the wage-basket (variable capital). Expenditure of living labor beyond necessary labor "results" in surplus-labor. The latter is crystallized as a surplus value, "over and above" its "premise," cost price, *K*. When considered in relationship to *K*, surplus value assumes the mystified form of produced profit (*p*). So at this point, value and surplus value (= produced profit) are quantitatively determined. The temporal process of value formation can be described by rewriting Marx's equation for value as $K_t + p_{t,t+1} = W^{pt}_{t+1}$. The "premise" of value formation is K_t, given by the production prices fixed at the end of the preceding circuit. On the top of this "premise," living labor creates a surplus value during the production time that elapses between *t* and *t*+1. The "result" is W^{pt}_{t+1}, the value of commodities produced during the *production time* of year *t*+1; the superscript *pt* stands for "production time." At this point, the general rate of profit is also determined as the quotient between total surplus value objectified in the production process and total cost price, the "premise" of the capital circuit.

After production time, on January 1, 2001, a new circulation phase

(C'–M') is accomplished. Then, commodities are exchanged for their production prices, a quantitatively transformed form of their values given by the previously determined magnitudes, namely, K_t and the general rate of profit. The "transformation" means, therefore, that commodities are not exchanged for their values determined in production time ($W^{pt}_{t+1} = K_t + p_{t,t+1}$), but for their production prices. The latter are modified magnitudes, already determined during the production time, which are *manifested* during *circulation time*, $P^{ct}_{t+1} = K_t + p'_{t+1}$; the superscript *ct* stands for "circulation time." As in Marx's equations, production prices differ from values only because the appropriated profit (p') differs from the produced profit (p). The "transformation" brings about only a quantitative change, a change that allows a redistribution of total profit (= total surplus value) in circulation in such a way that all capitalists would obtain the general rate of profit were they actually to sell at these prices.

It is therefore clear that the production prices, which emerge at the *end* of any particular capital circuit, cannot determine the values formed *during* that circuit, but, on the contrary, the latter determine the former. Production price is only an external circulation-modified form assumed by the already determined magnitude of value. Certainly, production prices fixed at the *end* of one capital circuit (i.e., at the beginning of the next) affect the value formation in that next circuit. However, this is only a specific consequence of the fact that social labor-time must appear as money and that this manifestation involves quantitative divergences.[45] Conversely, money and the different price forms (among them, production prices) are only expressions of social labor-time, so that the amounts of social labor-time represented by the *paid* production prices are what must enter into the cost price of the *new* commodities and, then, into their *values*. Under the form of production price, assumed by the values at the end of a capital circuit, social labor-time becomes the determining "premise" for the value formation in the next circuit. Social labor-time and monetary production prices are not absolutely "separate systems," as Tugan-Baranowsky and others have imagined, but related facets of a unique reality: the substance of value and its necessary form of manifestation, which must differ quantitatively for capitalists to obtain the general rate of profit.

Concluding the "second example," Marx sums up the relation between cost price, value and production price as follows:

> The *cost price* of a commodity simply depends on the quantity of *paid* labor it contains, while the *value* depends on the total quantity of labor it contains, whether paid or unpaid; the *price of production* depends on the sum of paid labor plus a certain quantity of unpaid labor that is independent of its own particular sphere of production.[46]

This only translates into words the equations contained in the passage omitted by Engels. First, *cost price* depends on the quantity of *paid labor* it contains. This *paid labor* (K_t) can only be the labor paid through the form of production prices at the beginning of the capital circuit because commodities are no longer sold and bought at their values. Second, *value* (W_{t+1}) depends on the total labor it contains "whether paid or unpaid," so that value is formed as the sum of cost price (paid labor, K_t) + surplus value (unpaid labor, $m_{t,t+1} = p_{t,t+1}$). Finally, *production price* (P_{t+1}) is the sum of cost price (paid labor, K_t) + the amount of profit necessary for obtaining the general rate of profit (p'_{t+1}).

It may seem[47] that to regard the formation of value as a temporal process is to contradict Marx's concept that a commodity's value is determined, not by the amount of labor it actually contains but by the amount of labor needed to reproduce it. To discuss this, let us suppose that, at the beginning of the circuit, a yarn-producing capitalist advances \$100 to purchase a ton of flax. Over the year, the flax is consumed and the social labor-time represented by \$100 is then transferred to the value of yarn. At the end of the year, the capitalist sells the yarn and repurchases flax, finding that its price has fallen to \$90/ton. According to Marx, this implies that the existing *stocks* of flax will be revalued.[48] This revaluation has been interpreted as also implying a retroactive change in the social labor-time *already transferred* from the flax to the yarn during the preceding year so that, at the end of the year, the value transferred from the flax would be \$90, instead of \$100. In other words, the social labor-time paid under the form of cost price would not be determined at the beginning of the circuit but at its end or, more precisely, the input (flax) and output (yarn) prices and values should be determined *simultaneously*, at the end of the circuit. This interpretation, however, does not take into account that, although the *existing* stocks of flax are indeed revalued, the flax purchased at the beginning of the circuit has been consumed, that is, its use-value has been destroyed during the production process. So, at the end of the circuit,

that flax no longer has exchange-value because it no longer exists, and the value represented by its price has already been transferred to the yarn. It is not a stock that can be revalued; nor can the value advanced and transferred be modified retroactively.[49]

An extension of the single-table transformation example

The transformation procedure can be illustrated by means of an example similar to Tugan-Baranowsky's and Bortkiewicz's.[50] In order to do that, Table 3 will be modified slightly as Table 4. The original table has been converted into a simple reproduction schema by adding spheres 1 and 2, interpreted as producers of "machines" (department I), while sphere 3 is department II, which produces "corn." I abstract from technical change and fixed capital, and assume market clearing. The numbers are in money units ($), assuming that the monetary expression of labor-time is constant, $1 = 1 working day.[51] Column Q is the amount of use-values, measured in natural units; *W/Q* and *P/Q* are, respectively, the unit values and the unit production prices. At the start of year 0 (*M–C*), capitalists advance K_t = 240_{c+v}$ to purchase 100 means of production at $2.40 each ($240$_c$), and hire 120 worker-days of labor-power. Because the wage is $0.5 per day, total variable capital is 60_v$, an amount that will allow the workers to purchase 50 means of consumption ($1.20 each). During the year, living labor is spent, transferring constant capital to the new commodities and generating a surplus value (*m*) or profit (*p*) amounting to $60. Value ($W^{pt}_{t+1} = K_t + p_{t,t+1}$) objectified in both departments is, respectively, W_{I} = $200 + $30 = $230 and W_{II} = 100_c$ + 30_v$ = $130. Because total surplus value is $60, the uniform rate of profit is determined as: $60_p/(240_c + 60_v) = 20$ percent. During the next circulation phase (*C′–M′*), commodities are exchanged at their production prices, formed as $P^{ct}_{t+1} = K_t + p'_{t+1}$, that is, their cost price + the corresponding fraction of profit that would allow capitalists to obtain a 20 percent profit on their advanced capital. Values are then transformed into production prices by replacing *p* with *p′*. For department I, $200 * (1 + 0.2) = $240 and, for department II, $100 * (1 + 0.2) = $120. Clearly, the sum of production prices is equal to the sum of values ($360) and total surplus value ($60) has been only redistributed in circulation. Since the initial production prices are stationary, there is no technical change and the wage rate

Table 4
Year 0: Simple reproduction without technical change

	c	v	K	$m=p$	W	p'	P	Q	W/Q	P/Q
I	170	30	200	30	230	40	240	100	2.30	2.40
II	70	30	100	30	130	20	120	100	1.30	1.20
Σ	240	60	300	60	360	60	360			

is constant; at the end of this circuit, values and production prices are the same as those at the beginning.

To explore the effect of technical change, let us suppose that in year 1, capitalists introduce labor-saving innovations, reducing the amount of living-labor from 120 to 100 working days, *ceteris paribus*. The economy is, then, as shown in Table 5.

At the end of year 0, capitalists purchase the 100 newly produced machines for \$240, but only 100 working days, which cost \$50. Therefore, capital advanced at the start of year 1 is lower than that advanced in year 0, releasing \$10. This means that the working class cannot purchase as much corn as it did in the previous year. Notwithstanding this, in order to maintain the simplification of market clearing, it is assumed that capitalists, who buy an extra amount of corn (revenue), spend the money capital released. During year 1, living labor is consumed, producing a surplus value equal to \$50. Unit values are lower than in year 0, reflecting the labor-saving innovations, W_{I} = \$2.20 and W_{II} = \$1.20. The rate of profit is now equal to $50_{p}/(240_{c} + 50_{v})$ = 17.2 percent so that unit production prices are P_{I} = \$2.286 and P_{II} = \$1.114. Total value (\$340) is equal to total production price and total surplus value (\$50) is equal to total profit. Assuming that in year 2 capitalists will purchase the same amount of machines and living labor, we can see that the reduction in the production prices provoked by the innovations will cause another release of money capital. In effect, the machines that were worth \$240 at the beginning of year 1 are now worth \$228.62, and the 100 working days can be purchased for \$46.41, instead of \$50. This releases approximately \$15 that may be consumed by the capitalists as revenue.

It is important to note that the labor-saving innovations *reduce* the rate of profit measured in social labor-time. This differs from the interpretation proposed by Tugan-Baranowsky according to which the effect of increasing productivity is a rise in the profit rate.[52] It

Table 5
Year 1: The effect of labor-saving innovations

	c	v	K	$m=p$	W	p'	P	Q	W/Q	P/Q
I	170	25	195	25	220	33.6	228.6	100	2.2	2.286
II	70	25	95	25	120	16.4	111.4	100	1.2	1.114
Σ	240	50	290	50	340	50.0	340.0			

may seem that this result comes from the fact that the temporally determined prices do not correspond to the equilibrium positions that would be reached after a given number of circuits if the new technique were not modified. However, there is no reason why this equilibrium position would be reached *before* new innovations were introduced. Tugan-Baranowsky's result requires an *instantaneous* adjustment to a situation in which input and output production prices and values are identical, something that could result from the action of a phantom-like Walrasian auctioneer, but not from the dynamic of capital.

Notes

1. MEGA^2 II/4.2 "Die Gestaltungen des Gesammtprozesses," written between summer 1864 and December 1865. This is the "Main Manuscript" Engels refers to in the Preface of *Capital,* vol. III, p. 94. See a critical appraisal of Engels' edition of *Capital,* vol. III, in Heinrich (1996–97).

2. See notes 23 and 42 for the references.

3. A nonexhaustive list of passages in which Marx deals with the transformation can be found in Ramos and Rodríguez (1996), p. 74, n. 10. As far as I know, Marx presents five *tabular* illustrations of the transformation: The first (2 tables, 5 spheres) in *Theories of Surplus Value*, vol. II, pp. 67–68; the second (1 table, 4 spheres) in a letter to Engels dated August 2, 1862; the third (1 table, 4 spheres) in *Theories of Surplus Value,* vol. II, p. 389; the fourth (3 tables, 5 spheres) in *Capital,* vol. III, pp. 255–256; and the fifth (1 table, 3 spheres), ibid., p. 264. The latter will be discussed below.

4. Tugan-Baranowsky (1905), pp. 170–174; Bortkiewicz (1906, 1907a, 1907b). Muehlpfordt (1893 and 1895) presents the same approach and "solution" as Bortkiewicz but was only recently rediscovered by Howard and King (1989), pp. 55–57.

5. *Capital*, vol. III, pp. 255–256 and pp. 263–265; MEGA^2 II/4.2, 231–3 and 240–1.

6. *Capital*, vol. III, pp. 255–256; MEGA^2 II/4.2, 231–3. The Main Manuscript and the published version do not differ conceptually.

7. Superscript λ indicates that the magnitude corresponds to the *value* of inputs, and subscript ij that input i is used in the production of j.

8. Bortkiewicz (1907a), p. 9. The argument had already been raised by a collaborator of Böhm-Bawerk, J.v. Komorzynski: "Marx has disregarded the mutual dependence of the prices of the various products and the same omission is found in many passages where he presents the 'price of production' as 'cost price' including profit but, at the same time, he defines 'cost price' as the 'value' of the consumed constant and variable capital. [For example, Marx asserts that] prices of production 'are equal to their cost elements (the value of the constant and variable capital consumed) plus a profit determined by the general rate of profit" (Komorsynski, 1894, pp. 294, 289). The passage cited from Marx is *Capital*, vol. III, p. 779. Komorzynski confuses the *value of constant* and *variable capital*, which is determined by the *prices* the capitalists pay when advancing money, with the *value of the means of production* and *consumption*, given by the social labor-time materialized in those commodities.

9. Superscript *P* indicates that the magnitude corresponds to the *production price* of inputs.

10. Howard and King (1975), p. 144.

11. Tugan-Baranowsky (1905), p. 174; Samuelson (1970).

12. Bortkiewicz (1907a), p. 12.

13. "Value-calculation means to determine the exchange-relationships of goods according to the Law of Value. Price-calculation means to determine the same exchange-relationships according to the Law of the Equal Rate of Profit" (Bortkiewicz, 1907a, p. 6). So, production price is no longer a "transformed form of value" but an *alternative* rule of exchange. Dualism could be traced back to the early notion (Sombart, Schmidt) that "value . . . is not an empirical fact but an ideal or logical one" (Engels, 1895, p. 1031), a vision also shared by Bernstein, for whom value is "a purely abstract entity" (Bernstein, 1899, p. 34). In addition, Engels' "historical" conception of the transformation—"value" would belong to a precapitalist stage ("simple commodity production") while "production price" is particular to capitalism—may have contributed to this dualistic interpretation. Kautsky's influential *Ökonomische Lehren* disseminated Engels' point of view (Kautsky, 1936, pp. 19–22, 241–243). On "dualism," see Ramos and Rodríguez (1996), and on Engels' "historic" interpretation of value, see Weeks (1981), pp. 12–23 and Hecker (1997).

14. "Money as a measure of value is the necessary form of appearance of the measure of value which is immanent in commodities, namely labor-time" *(Capital*, vol. I, p. 188).

15. *Grundrisse*, p. 168.

16. "The magnitude of the value of a commodity . . . expresses a necessary relation to social labor-time which is inherent in the process by which its value is created. With the *transformation of the magnitude of value into the price* this necessary relation appears as the exchange-ratio between a single commodity and the money commodity which exists outside it. This relation, however, may express both the magnitude of value of the commodity and the greater or lesser quantity of money for which it can be sold under the given circumstances. The possibility, therefore, of a quantitative incongruity between price and magnitude of value, i.e. the possibility that the price may diverge from the magnitude of value, is inherent in the price-form itself" (*Capital*, vol. I, p. 196).

17. Compare *Capital*, vol. III, p. 256 and Bortkiewicz (1907a), p. 8.

Bortkiewicz does not offer any explanation for the suppression of these columns as he does regarding the conversion of the tables into simple reproduction schemes. Although he complains about Marx's alleged failure to "keep separate rigorously enough the two principles of value- and price-calculation" (ibid.), he does not explain why these "principles" should be "rigorously" separated.

18. In the current literature, this *sequential non-dualism* is also known as the *temporal single-system* interpretation, or TSS.

19. *Capital*, vol. III, pp. 263–265; MEGA^2 II/4.2, 240–1.

20. *Capital*, vol. III, p. 263; MEGA^2 II/4.2, 239.37–40. When I find little difference between the text of *Capital*, vol. III and the Main Manuscript, I use the English translation of *Capital*, vol. III. If I find significant differences, I cite from the Main Manuscript, which is published in German.

21. Actually, after the text referred to in note 20, there is a parenthetic digression referring to the calculation of production price when there is fixed capital (ibid., 239.41–240.7).

22. Ibid., 240.7–27. In Marx's original, the letter in square brackets is *K*, an obvious slip of the pen. According to the editors, the text 239.41–240.26 "wurde mit Rotstift angestrichen" (*Apparat*, p. 992).

23. Similar propositions have been defended in different forms by Roberts (1981, 1987, 1997), Wolff, Roberts, and Callari (1982), Carchedi (1984, 1991), Kliman and McGlone (1988, 1999), Ramos (1991, 1995, 1996), Giussani (1991–92), Lee (1993), Moseley (1993), Rodríguez (1994, 1996), Freeman (1995, 1996a), Gouverneur (1995), Ramos and Rodríguez (1995, 1996), Carchedi and de Haan (1996), McGlone and Kliman (1996) and Foley (1997). A precursor of this approach is Mattick (1981).

24. *Capital*, vol. III, p. 118. This text is not part of the Main Manuscript; notation from MEW 25, p. 34 and the omitted passage.

25. "*Profit* is firstly only *another name*, or another category, for *surplus value*. Since the whole labour appears to be paid through this form of wages, the unpaid part of the same necessarily appears as being not a result of labour, but a result of capital, and not of the variable part of the same, but of the total capital. The *surplus value* thereby receives the form of *profit*, without any *quantitative* difference between the one and the other. It is only the illusory form of appearance of the same" (Letter to Engels, April 30, 1868).

26. *Capital*, vol. III, p. 263; MEGA^2 II/4.2, 240.28–241.4. Notation from the Main Manuscript.

27. Ibid., 241.24–28; the modified text in *Capital*, vol. III, p. 264.

28. *Capital*, vol. III, p. 264.

29. Note also that, in the "hidden table," spheres 2 and 3 exhibit a low and high composition of capital, respectively, while in the arithmetical illustration this order was inverted.

30. "Kostenpreiβ = Werth des in der Production der Waaren vorgeschossenen Capitals," MEGA^2 II/4.2, 240.12–13. When fixed capital is not employed, advanced capital is the same magnitude that consumed (*aufgezehrtes*) capital.

31. Howard and King (1975), p. 144.

32. MEGA^2 II/4.2, 241.39–242.11; *Capital*, vol. III, pp. 264–265.

33. "Let us . . . assume that the productivity of the spinner's labor . . . remains

constant . . . but that the exchange-value of the cotton varies, either by rising to six times its former price or by falling to one-sixth of that price. In both these cases, the spinner . . . adds as much value, as he did before the change in the value. . . . Nevertheless, the value he transfers from the cotton to the yarn is either six times what it was before, or, in the second case, one-sixth as much. The same result occurs when the instruments of labor become cheaper or more expensive, while their usefulness in the labor process remains unaltered" (*Capital*, vol. I, pp. 309–310. English translation corrected according to MEW 23, p. 216).

34. For example, Sweezy (1942), p. 115.

35. See, for instance, Komorzynski's confusion described in note 8.

36. "The difference between production price and value, insofar as it enters into the price of the new commodity independently of its own production process is *incorporated into the value* of the new commodity as an antecedent element" (*Theories of Surplus Value,* vol. III, p. 167). I have substituted "production price" for "cost price," the term used in *Capital*; emphasis added.

37. "As for the variable capital, the average daily wage is certainly always equal to the value product of the number of hours that the worker must work in order to produce his necessary means of subsistence; but this number of hours is itself distorted by the fact that the production prices of the necessary means of subsistence diverge from their values" (*Capital*, vol. III, p. 261).

38. Values and production prices are measured in both social labor-time and money. The money that capitalists advance is only an objective representation of social labor-time.

39. MEGA^2 II/4.2, 283; *Capital*, vol. III, pp. 308–309.

40. MEGA^2 II/4.2, 283–4; *Capital*, vol. III, p. 309.

41. MEGA^2 II/4.2, 242.11–20; *Capital*, vol. III, p. 265.

42. This interpretation has been developed by Perez (1980), Weeks (1981), Ernst (1982), Mandel and Freeman (1984), Carchedi (1984, 1991), Kliman (1988), Kliman and McGlone (1988, 1999), Giussani (1991–92), Ohno (1993), Freeman (1995, 1996a, 1996b), Maldonado-Filho (1995), Carchedi and de Haan (1996), Kliman (1996), McGlone and Kliman (1996) and Ramos (1997).

43. "The movements of capital through the production sphere and the two phases of the circulation sphere are accomplished successively in time [*in einer zeitlichen Reihenfolge*]. The duration of its stay in the production sphere forms its production time, that in the circulation sphere its circulation time. The total amount of time it takes to describe its circuit is therefore equal to the sum of its production time and its circulation time" (*Capital*, vol. II, p. 200; MEW 24, p. 124).

44. The monetary expression of labor-time (MELT) is the amount of money that represents one unit of social labor-time. See Ramos (1995, 1996, 1997). Marx assumes explicitly a constant MELT in a tabular example of the transformation procedure, "£1 = working day," letter to Engels, August 2, 1862, and at the beginning of *Capital*, vol. III, part three, "The Law of the Tendential Fall in the Rate of Profit," £2 = 1 working week, *Capital*, vol. III, p. 317; MEGA^2 II/4.2, p. 285.

45. *Capital*, vol. I, p. 196; see note 16.

46. *Capital*, vol. III, p. 265; MEGA^2 II/4.2, 242.25–30. Emphases from the Main Manuscript.

47. "Factors which alter the prices... of commodities... will cause simultaneous changes not only in the valuation of capital in those industries which use such commodities as means of production but also in the value of the commodity output in these industries" (Wolff, Roberts, and Callari, 1982, p. 581). See also Morishima (1973), p. 14n.

48. *Capital*, vol. I, pp. 317–318.

49. "Hence it follows that in the labor process the means of production transfer their value to the product only in so far as they lose their exchange-value along with their independent use-value" (*Capital*, vol. I, p. 311). See Kliman and McGlone (1999).

50. Tugan-Baranowsky (1905), pp. 171–173; Bortkiewicz (1907b), pp. 204–205.

51. See Ramos (1997) and note 44.

52. See Tugan-Baranowsky (1901), ch. 7, and Tugan-Baranowsky (1905), pp. 174–186. This proposition is currently known as the Okishio Theorem (see Okishio, 1961).

References

Bernstein, E. *Evolutionary Socialism* (1889). New York: Schocken Books, 1970.

Bortkiewicz, L.v. "Wertrechnung und Preisrechnung im Marxschen System (I)." *Archiv für Sozialwissenschaft und Sozialpolitik*, Neue Folge, Band XXIII, July 1906.

———. "Value and Price in the Marxian System." *International Economic Papers* (1952), 2. [Originally published as "Wertrechnung und Preisrechnung im Marxschen System (II, III)." *Archiv für Sozialwissenschaft und Sozialpolitik*, Neue Folge, Band XXV, July, September 1907a.]

———. 1907b. "On the Correction of Marx's Fundamental Theoretical Construction in the Third Volume of *Capital*." In P.M. Sweezy (ed.), *Karl Marx and the Close of His System*. New York: Augustus M. Kelley, 1966. [Originally published as "Zur Berichtigung der grundlengenden theoretischen Konstruktion von Marx im dritten Band des *Kapital*." *Jahrbücher für Nationalökonomie und Statistik*, Serie 3, Band XXIV, July 1907b].

Carchedi, G. "The Logic of Prices as Values." *Economy & Society* (1984), *13*:4.

———. *Frontiers of Political Economy*. London: Verso, 1991.

Carchedi, G., and de Haan, W. "The Transformation Procedure: A Non-Equilibrium Approach." In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996.

Engels, F. "Law of Value and Rate of Profit." In *Capital*, vol. III. 1895.

Ernst J.R. "Simultaneous Valuation Extirpated: A Contribution to the Critique of the Neo-Ricardian Concept of Value." *Review of Radical Political Economics* (1982), *14*:2.

Foley D.K. "Recent Developments in the Labor Theory of Value." Depart-

ment of Economics, Barnard College, Working paper no. 97–06, 1997.
Freeman A. "Marx Without Equilibrium." *Capital & Class* (1995), *56*.
———. "The Psychopathology of Walrasian Marxism." In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996a.
———. "Price, Value and Profit—A Continuous, General, Treatment." In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996b.
Freeman, A., and Carchedi, G., eds. *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996.
Giussani, P. "The Determination of Prices of Production." *International Journal of Political Economy* (1991–92), *21*:4.
Gouverneur, J. *Les fondements de l'économie capitaliste*. Paris: L'Harmattan, 1995.
Hecker, R. "On the Third Volume of *Das Kapital* and Engels' Interpretation of the "Simple Production of Commodities." Socialist Scholars Conference, New York, 1997.
Heinrich, M. "Engels' Editon of the Third Volume of Capital and Marx's Original Manuscript." *Science & Society* (1996–97), *60*:4.
Howard, M.C., and King, J.E. *The Political Economy of Marx*. Burnt Mill, Harlow, UK: Longman, 1975.
———. *A History of Marxian Economics. Volume I, 1883–1929*. London: MacMillan, 1989.
Kautsky, K. *The Economic Doctrines of Karl Marx*, trans. by H.J. Stenning. New York: MacMillan, 1936.
Kliman, A. "The Profit Rate Under Continuous Technological Change." *Review of Radical Political Economics* (1988), *20*:2&3.
———. "A Value-Theoretic Critique of the Okishio Theorem." In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996.
Kliman, A. and McGlone, T. "The Transformation Non-Problem and the Non-Transformation Problem." *Capital & Class* (1988), *35*.
———. "A Temporal Single-System Interpretation of Marx's Value Theory." *Review of Political Economy* (1999), *11*:1.
Komorzynski J.v. "Der dritte Band von Carl Marx *Das Capital*– Eine kritische Abhandlung über die Arbeitswerttheorie und die socialistische Lehre vom Capitalsertrage." *Zeitschrift für Volkswirtschaft, Socialpolitik und Verwaltung* (1897), *6*:2.
Lee, Chai-on. "Marx's Labour Theory of Value Revisited." *Cambridge Journal of Economics* (1993), *17*.
Mandel, E., and Freeman, A. *Ricardo, Marx, Sraffa. The Langston Memorial Volume*. London: Verso, 1984.
Maldonado-Filho, E. "Release and Tying up of Productive Capital and the' Transformation Problem." URPE Conference at the ASSA, fall 1995.
Marx K. *Das Kapital*, vols. I, II, III, MEW 23, 24, 25. Berlin: Dietz Verlag, 1988, 1986, 1988.
———. *Capital*, vols. I, II, III. Harmondsworth, UK: Penguin Books, 1976, 1978, 1981.

———. *Ökonomische Manuskripte 1863–1867*. MEGA² II/4.2, Berlin: Dietz Verlag/Amsterdam, IISG, 1992.
———. *Grundrisse*, Harmondsworth, UK: Penguin Books, 1973.
———. *Theories of Surplus Value*, vols. II, III. Moscow: Progress Publishers, 1968, 1971.
Marx K., and Engels, F. *Letters on Capital*. London: New Park Publication, 1983.
Mattick, P., Jr. "Some Aspects of the Value-Price Problem." *Economies et sociétés*, series 5 (1981), *15*:6–7 [reprinted in *International Journal of Political Economy* (1991–92), *21*:4].
McGlone, T., and Kliman, A. *One System or Two? The Transformation of Values into Prices of Production Versus the Transformation Problem*. In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996.
Morishima, M. *Marx's Economics*. Cambridge: Cambridge University Press, 1973.
Moseley F. "Marx's Logical Method and the 'Transformation Problem.'" In F. Moseley (ed.), *Marx's Method in Capital. A Reexamination*. Atlantic Highlands, NJ: Humanities Press, 1993.
Muehlpfordt, W. *Preis und Einkommen in der privatkapitalistischen Gesellschaft*. Königsberg: Hartungsche Buchdruckerei, 1893.
———. "Karl Marx und die Durchschnittsprofitrate." *Jahrbücher für Nationalökonomie* (1895), *65*.
Ohno, S. "Marx' Hauptmanuscript zum III. Buch des "Kapitals" und die Verwandlung des Wertes in den Produktionspreis." *Beiträge zur Marx-Engels-Forschung. Neue Folge*. Hamburg: Argument, 1993.
Okishio, N. "Technical Changes and the Rate of Profit." *Kobe University Economic Review* (1961), *7*.
Perez, M. "Valeur et prix: un essai de critique des propositions néo-Ricardiennes." *Critiques de l'économie politique*, N.S. (1980), *10*.
Ramos, A. "Competencia y Reproducción Capitalista: Una Interpretación de la Transformación de Valores en Precios de Producción." *Ciencias Económicas* (1991), *11*:1–2. Costa Rica, *Realidad Económica*, 105–106, Buenos Aires, 1992.
———. "The Monetary Expression of Labour: Marx Twofold Measure of Value." Second Miniconference of the IWGVT at the EEA, New York, March 17–19, 1995.
———. "The Monetary Expression of Labour: An Interpretation of the Relation Between Value-Substance and Value-Form." Third Miniconference of the IWGVTat the EEA, Boston, March 15–17, 1996.
———. "Labor, Money, Labor-saving Innovation and the Falling Rate of Profit." Fourth Miniconference of the IWGVT at the EEA, Washington DC, April 3–6, 1997.
Ramos, A., and Rodríguez, A. "Attività Nonriproduttive e Capitale Commerciale." *Plusvalore* (1995), *12*.
———. "The Transformation of Values into Prices of Production: A Different Reading of Marx's Text." In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996.

Roberts, B. "Value Categories and Marxian Method. A Different View of Price-Value Transformation." Ph.D. dissertation, University of Massachusetts at Amherst, 1981.

———. "Marx After Steedman: Separating Marxism from 'Surplus Theory'." *Capital & Class* (1987), 32.

———. "Embodied Labour and Competitive Prices: A Physical Quantities Approach." *Cambridge Journal of Economics* (1997), *21*.

Rodríguez, A. "Le travail et la formation des prix." Université Catholique de Louvain, Faculté des Sciences Economiques, Sociales et Politiques, N.S. no. 239, CIACO, Louvain-la-Neuve, 1994.

———. "Money, the Postulates of Invariance and the Transformation of Marx into Ricardo." In A. Freeman and G. Carchedi (eds.), *Marx and Non-Equilibrium Economics*. Cheltenham, UK: Edward Elgar, 1996.

Samuelson, P.A. "The 'Transformation' from Marxian 'Values' to Competitive 'Prices': A Process of Rejection and Replacement. *Proceedings of the National Academy of Sciences* (1970), *67*.

Sweezy, P.M. *The Theory of Capitalist Development*. New York: Monthly Review Press, 1942.

Sweezy, P.M., ed. *Karl Marx and the Close of His System*. New York: Augustus M. Kelley, 1966.

Tugan-Baranowsky, M. *Studien zur Theorie und Geschichte der Handelkrisen in England*. Jean: Gustav Fischer Verlag, 1901.

———. *Theoretische Grundlagen des Marxismus*. Leipzig: Duncker & Humblot, 1905.

Weeks, J. *Capital and Exploitation*. Princeton, NJ: Princeton University Press, 1981.

Wolff, R.D.; Roberts, B.; and Callari, A. "Marx's (not Ricardo's) 'Transformation Problem': A Radical Reconceptualization." *History of Political Economy* (1982), *14*:4.