The long and continuing controversy over Marx's analysis of the "transformation problem" has not paid sufficient attention to the logical method employed by Marx in the three volumes of *Capital*. The most common interpretation of the transformation problem is based on the work of Borkiewicz (1952), Sweezy (1968), Seton (1957), Morishima (1973), Medio (1972), Steedman (1977), and others. This interpretation of Marx's theory is referred to in this chapter as the "neo-Ricardian" interpretation. The logical method attributed to Marx's theory by this interpretation is essentially the same as the method of linear production theory (e.g., Sraffa's theory). This chapter argues that the logical method of linear production theory differs in fundamental respects from Marx's own method and thus that the conclusions reached by the neo-Ricardian interpretation of Marx's theory do not apply to Marx's theory, but instead apply only to linear production theory.

The first section of this chapter briefly reviews the well-known neo-Ricardian interpretation of the transformation problem. The next four sections discuss important aspects of Marx's logical method and contrast these aspects with the neo-Ricardian interpretation of Marx's method, that is, with the method of linear production theory. The next section responds to the widely accepted neo-Ricardian criticism that Marx "failed to transform the inputs of constant capital and variable capital" in his determination of prices of production. The last section briefly contrasts the interpretation presented here with the "new solution" to the transformation problem presented in recent years by Foley, Dumenil, and Lipietz.
NEO-RICARDIAN INTERPRETATION

As stated above, the neo-Ricardian interpretation assumes that the method of Marx's theory is essentially the method of linear production theory. The fundamental givens in linear production theory, and assumed to be in Marx's theory, are the physical quantities of the technical conditions of production and the real wage. These technical conditions and real wage provide a system of simultaneous equations that determines the unknown variables of the exchange-values (labor-values or prices) of the commodities produced and the rate of surplus-value or the rate of profit (depending on the equilibrium condition assumed).

According to the neo-Ricardian interpretation, Volume 1 of Capital is concerned with the "value system" in which the primary variables determined are the labor-values of individual commodities. These individual labor-values are derived from the technical conditions of production and the real wage, which are taken as given. The rate of surplus-value in value terms is also determined along with the values of individual commodities. The logic of this method is shown by the following "value equation":

\[ a_i x_i + (b_i x_i) (1 + s) = \lambda_i \]  \hspace{1cm} (1)

in which \( a_i \) refers to the material inputs required to produce each commodity, \( b_i \) refers to the current labor inputs required to produce each commodity, \( s \) to the goods included in the real wage, \( r \) to the rate of surplus-value, and \( \lambda_i \) to the value of each commodity. The matrices \( a \) and \( l \) constitute the "technical conditions of production," which together with the real wage determine the individual values and the rate of surplus-value.

The quantities of constant capital, variable capital, and surplus-value (either for individual industries or for the economy as a whole) can then be derived from these individual labor-values in the following way: Constant capital is assumed to be equal to the labor-value of producer goods, variable capital is assumed to be equal to the labor-value of wage goods, and surplus-value is assumed to be equal to the labor-value of surplus goods. Finally, the rate of profit is defined as the ratio of surplus-value to the sum of constant and variable capital, with the absolute magnitudes in both these ratios defined in labor-value terms as above.

Volume 3, according to this interpretation, is concerned with the "price system," in which Marx attempts to transform the labor-value variables determined in Volume 1 into the corresponding price variables. In the Volume 3 analysis, the technical conditions and the real wage are again taken as given, as in Volume 1. In addition, the value magnitudes derived in Volume 1 are also taken as given. From these givens, a set of "transforma-

tion multipliers" is derived that then can be used to convert the labor-value of each commodity (or each department) into its corresponding price. The rate of profit in price terms is also determined along with the prices of individual commodities. This logic is shown by the following "price equation":

\[ (a_i x_i + b_i x_i) (1 + r) = \lambda_i p_i \]  \hspace{1cm} (2)

in which \( x \) stands for the set of transformation multipliers (price per unit of value for each commodity) and \( r \) for the rate of profit. Here we can see that the individual prices are determined by the technical conditions of production, the real wage, and the individual values. The quantities of constant capital, variable capital, and surplus value are "revalued" in price terms as the price of producer goods, wage goods, and surplus goods, respectively.

The neo-Ricardian interpretation concludes that the above is a logically satisfactory solution to the transformation problem. However, three important implications follow from this method of solving the transformation problem that significantly reduce or even eliminate the usefulness of Marx's value theory. First, only one of the two important aggregate equalities emphasized by Marx (see below) can hold at the same time: either aggregate price equals aggregate value (or price proportional to labor-value) or aggregate profit equals aggregate surplus-value, but not both at the same time. Second, the "price" rate of profit derived in the price system is different from the "value" rate of profit derived in the value system, and these two rates of profit may have divergent trends. Finally, the ultimate criticism made by many neo-Ricardians is that the Volume 1 analysis of the value system is "redundant" or an "unnecessary detour" (e.g., Steedman 1977). The same prices and rate of profit can be derived directly from the given technical conditions of production and real wage without first deriving values and then transforming these values into prices.

I argue below that the logical method of linear production theory assumed in this neo-Ricardian interpretation of Marx's theory differs in fundamental respects from Marx's own logical method. In the following sections, I discuss the most important differences between Marx's method and the neo-Ricardian interpretation.

CAPITAL IN GENERAL AND MANY CAPITALS

The first important difference between the neo-Ricardian interpretation and Marx's theory has to do with the order of determination between aggregate economic magnitudes (such as total price or total profit) and the corresponding individual magnitudes. The neo-Ricardian interpretation generally ignores aggregate magnitudes, but it implicitly assumes that these aggregate
magnitudes are determined subsequent to individual magnitudes as the sum of these individual magnitudes. I argue, to the contrary, that in Marx’s theory, aggregate magnitudes are determined prior to and independent of individual magnitudes. Individual magnitudes are then determined at a later stage of the analysis, with the predetermined aggregate magnitudes taken as given.

Marx expressed this assumed order of determination between aggregate magnitudes and individual magnitudes in terms of the distinction between “capital in general” (or “total social capital”) and “many capitals” (or “competition”). The analysis of capital in general is concerned with the properties that all capitals have in common. Since these common properties are shared by all capitals, the analysis of capital in general is necessarily an analysis of the all capitals taken together, that is, of the total social capital:

We are concerned here with capital as such, (let us) say the capital of the whole society. The differentiation, etc. of capitals does not concern us yet. (Marx 1973, 346)

If I regard the total capital of e.g., a nation as distinct from total wage labor, . . . then I regard it in general. (Marx 1973, 852; see also Marx 1963, 416; Rosdolsky 1977, 46)

The most fundamental and essential property of all capitals is their capacity for self-expansion. Thus the main aim of the analysis of capital in general in Volume 1 is to show how the total social capital increases its magnitude, that is, how the total amount of surplus-value in the economy as a whole is determined.

Marx introduced the general framework for his analysis of capital in general in Chapter 4 of Volume 1 (“The General Formula for Capital”). This general analytical framework is expressed symbolically as $M \rightarrow C \rightarrow M'$, where $M' = M + \Delta M$. In this formula, $M$ represents the aggregate money-capital invested in the capitalist economy as a whole and $M'$ represents the aggregate money-capital recovered after the same period of time (not specified at this early stage of the analysis). $\Delta M$ represents the aggregate amount of surplus-value produced during this period in the capitalist economy as a whole, which includes not only industrial profit, but also merchant profit interest, and rent. The remainder of Volume 1 is devoted primarily to an analysis of the determinants of the magnitude of this $\Delta M$.

The fact that the purpose of the process is that $x + \Delta x$ also points to the path our own investigation should take. (Marx 1977a, 977)

The investigation of the origin of surplus-value has therefore formed the most important problem of political economy from the Physiocrats to the present day. (Marx and Engels 1988, 28)

Marx often illustrated the analysis of capital in general with an individual capital, usually a capital in the cotton industry. However, this individual capital is not the real subject of Marx’s analysis. An individual capital is considered in Volume 1 only as a typical representative of the total social capital for the purpose of illustration (Rosdolsky 1977, 48; Foley 1986, 6). Since the analysis is about the common properties shared by all capitals, any capital may serve as the representative of the total capital.

In capitalist production [i.e., in Volume 1], each capital is assumed to be a unit, an aliquot part of the total capital. (Marx 1963, 416)

Volume 3 is then concerned primarily with the level of abstraction of many capitals. The main subject of the analysis of many capitals in Volume 3 is the division of surplus-value among individual capitalists and into individual component parts. In other words, the analysis of many capitals is concerned with the distribution of surplus-value, as distinct from the production of surplus-value. Since individual magnitudes are determined subsequent to aggregate magnitudes, the distribution of surplus value is determined subsequent to the production of surplus-value.

The profit of the capitalists as a class, or the profit of capital as such, has to exist before it can be distributed, and it is extremely absurd to try to explain its origin by its distribution. (Marx 1973, 684; emphasis added)

Part 2 of Volume 3 analyzes the distribution of surplus-value among the individual branches of production, and Parts 4–6 analyze the further division of surplus-value into industrial profit, merchant profit, interest, and rent. This chapter is concerned with the first of these two issues: the distribution of surplus-value among branches of production. Since the distribution of surplus-value is accomplished primarily by means of the prices of individual commodities, the analysis of many capitals also necessarily involves the determination of these individual prices. In this analysis of individual prices and individual components of surplus-value, the total price of all commodities together and the total surplus-value for the economy as a whole are taken as given, as determined in Volume 1 (see below for a further discussion of this last point).³

Marx considered his analysis of the total amount of surplus-value prior to its division into individual parts one of the three “fundamentally new” aspects of Capital.

In contrast to all former political economy, which from the very outset treats the different fragments of surplus-value with their fixed forms of rent, profit, and interest as already given, I first deal with the general form of surplus-value in which all these fragments are still undifferentiated—in solution as it were. (Marx and Engels 1975b, 186; emphasis added; see also Marx and Engels 1975b, 180; Marx 1963, 40, 92)
In Marx’s analysis of capital in general, the individual parts of surplus-value and other phenomena related to individual capitals are intentionally disregarded altogether; that is, these individual phenomena are abstracted from.

The introduction of many capitals must not interfere with the investigation here. The relation of the many will, rather, be explained after what they all have in common, the quality of being capital, has been examined. (Marx 1973, 517)

This method of abstraction is important to keep in mind because individual phenomena often seem prima facie to contradict the assumptions made and conclusions reached in the analysis of capital in general. In the later analysis of many capitals, the division of surplus-value into individual parts and other individual magnitudes is explained on the basis of the assumptions made and the conclusions reached in the prior analysis of capital in general. In the process, the apparent contradictions are resolved and shown to be consistent with the earlier assumptions and conclusions. In this way, the analysis of capital in general provides what Marx called “intermediate links,” which are necessary before an explanation of the phenomena related to many capitals can be given (see the passages quoted below and Rostelsky 1977, 374–75, 565–68).

Marx called attention to his method of abstraction in two important passages in Volume I of Capital. In Chapter 5, Marx argues that the origin of surplus-value cannot be explained as long as the analysis is restricted solely to the sphere of circulation, in which the only activities considered are buying and selling. By Marx’s assumption, buying and selling involve the exchange of equivalent values. No surplus-value can be created through this exchange of equivalents. Marx points out that this conclusion seems to be contradicted by the existence of merchants’ profit and bankers’ interest. Merchants and bankers are engaged (more or less) exclusively in activities of circulation, yet merchants obtain a profit and bankers obtain interest as a result of their activities.

Marx remarks that in order to explain these apparently contradictory phenomena, “a long series of intermediate steps” is necessary, which is “entirely absent” in the analysis thus far. In other words, before Marx analyses the individual components of surplus-value, he first analyzes the determination of the total amount of surplus-value at the level of capital in general. In this prior analysis, the individual parts of surplus-value are ignored altogether. Marx promises to explain this apparent contradiction at a later stage in the analysis:

In the course of our investigation, we shall find that both merchants’ capital and interest-bearing capital are derivative forms [of industrial capital]. (Marx 1977a, 267; emphasis added)

The second passage relates specifically to the “transformation problem.” In Chapter 11, Marx discusses three laws that follow from his theory of surplus-value. The third law is that the amount of surplus-value produced during a given period of time is proportional to the amount of variable capital invested (with the rate of surplus-value as the factor of proportionality). Marx notes that if this law is applied directly to individual industries, then it seems to be contradicted by the observable phenomenon that individual capitals with unequal proportions of variable capital and constant capital tend to make equal rates of profit (i.e., that profit is proportional to the total capital, not just to the variable capital). Marx then notes that “for the solution of this apparent contradiction, many intermediate terms are still needed” (Marx 1977a, 421). In other words, this apparent contradiction cannot be resolved at the level of analysis of capital in general, but can only be resolved in the later analysis of many capitals. Marx’s resolution of this apparent contradiction is of course his solution to the transformation problem.

Marx argued that Ricardo and his followers were not able to provide a satisfactory explanation of the phenomenon of equal rates of profit precisely because they failed to follow the method of abstraction described above. Rather than first abstracting from equal rates of profit in the analysis of capital in general and then explaining this phenomenon in the subsequent analysis of many capitals on the basis of prior conclusions, Ricardo assumed equal rates of profit along with the law of value in the very first chapter of his Principles and then examined the extent to which these different assumptions were mutually contradictory. Thus Ricardo omitted the essential “intermediate links” and sought to prove the direct conformity of the law of value with equal rates of profit. This is an impossible task, as Malthus and many others have pointed out.

In Chapter 10 of Theories of Surplus-Value, Marx discussed at length this fatal methodological weakness in Ricardo’s theory. Because of the importance of this point, it is worthwhile to quote a few passages at length from this chapter:

Ricardo’s method is as follows; He begins with the determination of the magnitude of the value of the commodity by labor-time and then examines whether the other economic relations and categories contradict this determination of value or to what extent they modify it. The historical justification of this method of procedure, its scientific necessity in the history of economics, are evident at first sight, but so too is, at the same time, its scientific inadequacy. This inadequacy not only shows itself in the method of presentation (in a formal sense) but leads to erroneous results because it omits some essential links and directly seeks to prove the congruity of the economic categories with one another. (Marx 1968b, 164; emphasis added)
Instead of postulating this general rate of profit, Ricardo should have examined how far its existence is consistent with the determination of value by labor-time and he would have found that instead of being consistent with it, prima facie, it contradicts it, and that its existence would therefore have to be explained through a number of intermediary stages, a procedure very different from merely including it under the law of value. (Marx 1968b, 174; emphasis added)

One can see that though Ricardo is accused of being too abstract, one would be justified in accusing him of the opposite: lack of power of abstraction, inability, when dealing with the values of commodities, to forget profits, a factor which confronts him as a result of competition. (Marx 1968b, 191; emphasis added)

In a letter to his friend Dr. Kugelmann, Marx commented again on this crucial difference between his method and Ricardo's:

Science consists precisely in demonstrating how the law of value asserts itself. So that if one wanted at the very beginning to "explain" all the phenomena which seemingly contradict that law, one would have to present the science before science. It is precisely Ricardo's mistake that in his first chapter on value he takes as given a variety of categories that have not yet been explained in order to prove their conformity with the law of value. (Marx and Engels 1975b, 196)

Thus we conclude that, according to Marx's method, aggregate economic magnitudes are determined in the analysis of capital in general in Volume 1, prior to and independent of the determination of individual magnitudes in the analysis of many capitals in Volume 3, and that the previously determined aggregate magnitudes are taken as given in the subsequent analysis of individual magnitudes. Most important, the total amount of surplus-value is determined prior to the individual parts into which this surplus-value is divided and is taken as given in the subsequent analysis of the individual parts. The following sections discuss further the nature of the given in Marx's theory at these two levels of abstraction.

**Givens in Terms of Money**

A second important difference between the neo-Ricardian interpretation and Marx's method has to do with precisely what is taken as given, first of all in Marx's theory of surplus-value in Volume 1 and then in his theory of prices of production in Volume 3. The neo-Ricardian interpretation assumes that the fundamental givens in both of these stages of Marx's theory are the same as those in linear production theory: the physical quantities of the **technical conditions of production and the real wage.** I argue, to the contrary, that the fundamental givens in Marx's theory are **quantities of money, quantities of abstract labor, and the quantity of money that represents one hour of abstract labor.** This section focuses on the sums of money that Marx takes as given.

The analytical framework for Marx's theory is the circulation of capital. As discussed above, Marx first introduced the circulation of capital in Chapter 4 of Volume 1 in the abbreviated form in which it appears in circulation: M-C-M'. As is well known, the complete form of the circulation of capital, which includes the production process, is M-C...P...C'-M'. The important point for our purposes is that the **starting point in these formulas is M—a sum of money invested as capital to purchase the means of production and labor-power.**

[A]ll new capital, in the first instance, steps onto the stage—i.e., the market...in the shape of money, money which has to be transformed into capital by definite processes. (Marx 1977a, 247)

I argue that the magnitude of this M that initiates the circulation of capital is taken as given in Marx's theory of the emergence of surplus-value in the later stages of the circulation of capital. Indeed, Marx's theory of surplus-value explains how this given amount of money increases its magnitude, that is, how money is transformed into capital. The givens in the Volume 1 theory of surplus-value are aggregate sums of money invested as capital in the capitalist economy as a whole. This interpretation is supported first of all by the very structure of Marx's formulation of the circulation of capital, which begins with a sum of money.

The neo-Ricardian interpretation, to the contrary, ignores Marx's formulation of the circulation of capital in terms of money and seems to imply that the analytical framework for Marx's theory is something like C...P...C, which may be described as "the production of commodities by means of commodities," in which the fundamental givens are physical quantities of inputs into production. This analytical framework is fundamentally different from the transformation of money into capital.

My interpretation that the initial money-capital in the circulation of capital is taken as given is further supported by the theoretical development of Marx's key concepts in Parts 1, 2, and 3 of *Capital.* In Part 1, Marx derives the necessity of money from an analysis of commodities (see Murray, Chapter 2, this volume). In Part 2, as we have seen, Marx defines capital in terms of this previously derived concept of money: as money that becomes more money. The title of Part 2, it should be recalled, is "The Transformation of Money into Capital." Marx clearly expresses this logical relation between money and capital in the following passage:
[T]he development of capital already presupposes the full development of the exchange-value of commodities and consequently its independent existence as money. The point of departure in the process of the production and circulation of capital, is the independent form of value which maintains itself, increases, measures the increase against the original amount, . . . The relation between the value antecedent to production and the value which results from it—capital as antecedent value in contrast to profit—constitutes the all-embracing and decisive factor in the whole process of capitalist production. (Marx 1971b, 131; second emphasis added)

Part 3 then analyzes the origin of the increment of money that is characteristic of capital, with the initial money-capital taken as given. Marx does not suddenly in Part 3 ignore the prior logical development of money and capital and surplus-value in Parts 1 and 2 and introduce out of nowhere the technical conditions of production and the real wage as the givens in his theory of surplus-value. Instead, Parts 1 and 2 provide the logical presuppositions for his analysis of surplus-value in Part 3 and beyond. The arguments presented in other chapters in this volume by Smith (Chapter 1), Murray (Chapter 2), and Arthur (Chapter 3), which demonstrate the necessary connections between Marx's concepts of commodities, money, and capital, also support the interpretation presented here that the givens in Marx's theory of surplus-value are sums of money invested as capital. The neo-Ricardian interpretation, on the other hand, has no explanation for Marx's analysis in Parts 1 and 2 or for the logical relation between these two parts and the theory of surplus-value in Part 3.

Finally, my interpretation is also supported textually by the numerous passages throughout the various drafts of Capital that refer to the money-capital, which initiates the circulation of capital as the "presupposed capital" or the "postulated capital" or the "point of departure" for the circulation of capital (see, for example, Chapter 4 of Volume 1 of Capital and the several earlier drafts of this chapter in Marx 1973, 250–64; Marx and Engels 1987, 501–7; and Marx and Engels 1988, 9–20). One especially clear passage is the following from the manuscript entitled "Results of the Immediate Process of Production":

Here, where we are concerned with money only as the point of departure for the immediate process of production, we can confine ourselves to the observation: capital exists here as yet only as a given quantum of value = M (money), in which all use-value is extinguished, so that nothing but the monetary form remains. . . . If the original capital is a quantum of value = x, it becomes capital and fulfills its purpose by changing into x + dx, i.e., into a quantum of money or value = the original sum + a balance over the original sum. In other words, it is transformed into the given amount of money + additional money, into the given value + surplus-value. . . . As a given sum of money, x is a constant from the outset and hence its increment = 0. In the course of the process, therefore, it must be changed into another amount: which contains a variable element. Our task is to discover this component and at the same time to identify the mediations by means of which a constant magnitude becomes a variable one. (Marx 1977a, 976–77; emphases in the original)

As this passage indicates, Marx's methodological procedure is to take a sum of money as given and to analyze how this given sum of money increases its magnitude—that is, how it is transformed into capital.

The initial money-capital that Marx takes as given in his theory of surplus-value is assumed to be the objective "form of appearance" of abstract social labor. This function of money as the form of appearance of abstract labor is the main conclusion of Marx's prior analysis of commodities in Part 1 of Volume 1.

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. (Marx 1977a, 188)

Money is now objectified labor, irrespective of whether it possesses the form of money or a particular commodity. (Marx and Engels 1987, 502)

The starting point [of capital] is money . . . the converted form of the commodity, in which . . . the labor contained in x has the form of general social labor. (Marx and Engels 1988, 11)

Capital is money, the independent existence of exchange-value, objectified general social labor. (Marx and Engels 1988, 134)

This important conclusion is then presupposed in the remainder of Capital and in his theory of surplus-value in particular. Thus the aggregate money-capital taken as given beginning in Part 2 of Volume 1, like any other quantity of money, is assumed to represent a definite quantity of abstract social labor. The precise quantity of abstract social labor represented by a given quantity of money depends on the value of money (more on this below), which Marx also takes as given (Marx 1977a, 214).

The Theory of Aggregate Price and Surplus-Value

This section examines in greater detail Marx's theory of aggregate price and surplus-value presented in Part 3 of Volume 1. We have seen above that
Marx takes as given the initial money-capital invested in the first phase of the circulation of capital. Marx divided this given initial money-capital (M) into two component parts: constant capital (C), invested in means of production; and variable capital (V), invested in labor-power. Algebraically: \( M = C + V \) (all defined in terms of money). According to Marx’s theory of value and surplus-value, these two given quantities of aggregate money-capital play entirely different roles in the determination of the aggregate price of commodities and thus in the determination of the aggregate amount of surplus-value.

The quantity of constant capital, which is equal to the price of the means of production, becomes one component of the aggregate price of the final product. In other words, the price of the means of production is “transferred” to the price of the final product.

Since, with the exception of the additional labor, the elements of capitalist production already enter the process of production as commodities, i.e., with specific prices, it follows that the value added by the constant capital is already given in terms of a price. For example, in the present case it is the $80 for flax, machinery, etc. (Marx 1977a, 957; emphasis added except for the last word, “price”)

If we take society at any one moment, there exists simultaneously in all spheres of production . . . a definite constant capital—presupposed as a necessary condition of production . . . . The value of this constant capital . . . is a postulated value which must reappear in the value of the product. (Marx 1963, 109; emphasis added; see also Marx 1973, 762; Marx and Engels 1988, 20)

The constant capital that is taken as given and transferred to the price of the final product is the current replacement costs of the existing means of production, not the actual historical costs of these means of production (Marx 1977a, 317–18, 677; 1982, 112, 139–41, 206–7; 1963, 109; 1968b, 415–16, 473; 1971b, 178). The current replacement costs may differ from the actual historical costs for two reasons: technological change in the production of means of production and/or changes in the value of money. Carchedi discusses at length the case of technological change in Chapter 8 of this volume and in Carchedi 1984 and 1988.6

The variable capital, which is equal to the price of labor-power, does not become a component of the price of the final product. Instead, the variable capital is replaced by current labor, and this labor produces new-value, which becomes the second component of the aggregate price of commodities. This new-value component of the price of commodities produced by current labor both reproduces the variable capital invested in labor-power and provides the surplus-value of capitalists (see below).

The characteristic feature of variable capital is that a definite, given (and as such constant) part of capital . . . is exchanged for a self-expanding, value-creating power, viz. labor-power, which not only reproduces its value, paid by the capitalist, but simultaneously produces a surplus-value, a value not existing previously and not paid for by any equivalent. This characteristic property of the part of capital laid out for wages . . . distinguishes it tene coste as variable capital from constant capital. (Marx 1981, 217–18; first emphasis added)

The different roles played by constant capital and variable capital in the determination of the price of commodities are emphasized by Marx in his discussion of the category of “cost price” in Chapter 1 of Volume 3 of Capital. Marx’s main point in this discussion is that the category of cost price obliterates the crucial distinction between constant capital and variable capital and makes it appear as if both constant capital and variable capital transfer their value to the price of the product. Marx emphasizes that, according to his theory, only the value of the constant capital is transferred to the price of the product.

We know from Volume 1 that the value of the product newly formed, in this case $600, is composed of (1) the reappearing value of the constant capital of $400 spent on the means of production, and (2) a newly produced value of $200.

By the purposive character of the labor . . . the value of the means of production consumed, a total of $400, is transferred from these means of production to the product. This old value reappears therefore as a component of the product’s value, though it does not originate in the production process of this commodity. It exists only as a component of the commodity’s value because it existed previously as a component of the capital advanced. The constant capital that was spent is thus replaced by the portion of commodity value that it itself adds to this commodity value. This element of the cost price . . . forms a component of this commodity value because it is the value of capital that has been used up, or because the means of production cost such and such an amount.

It is quite the reverse with the other component of cost price. . . .

This advance of capital value does not go in any way into the formation of the new value. (Marx 1982, 119–20)

In addition to these sums of money-capital, Marx also takes as given in his theory of the aggregate price of commodities two additional variables: (1) the aggregate amount of current abstract labor that is required to produce commodities (Lc), and (2) the quantity of money that represents one hour of abstract labor, or the rate at which abstract labor produces new-
value per hour ($m$). Abstract labor is defined by Marx to be homogeneous labor in which concrete labors of different skills and different intensities are reduced to equivalent quantities of skilled labor of average intensity. Marx's concept of current abstract labor thus differs from the current labor requirements taken as given in linear production theory because the latter treats all kinds of labor as equal and does not take into account labor of different skills and different intensities. The quantity of money that represents one hour of abstract labor is equal to the inverse of the labor value of a unit of money. These two variables together determine the aggregate amount of new-value (N) produced during the current period (N = mLc).

Marx's theory of the determination of the aggregate price of commodities can thus be represented algebraically by the following equations:

\[ P = C + N \]  
\[ P = C + mL_c \]

(3a)  
(3b)

where \( P \) represents the price of commodities and \( C \) represents constant capital.

Thus, according to Marx's theory, the constant capital and the money-value transferred from the means of production to the price of the final product are not derived from, nor are they necessarily proportional to, the labor required to produce the means of production. Instead this transferred value is assumed to be equal to the constant capital invested in the means of production, which as we have seen above is taken as given. This constant capital, like every other quantity of money, represents a definite quantity of abstract social labor.

The value of the means of production is presupposed, since the labor-time contained in the means of production was expressed in their prices in its general form, as social labor. (Marx and Engels 1988, 73)

The precise quantity of "past" abstract labor \( (L_p) \) represented by constant capital depends on the value of money \( (1/m) \) and is determined by the equation:

\[ L_p = C/m \]

(4)

This quantity of past abstract labor represented by the constant capital will be equal to the labor required to produce the means of production, or the labor "embodied" in the means of production, if and only if the price of the means of production is proportional to their labor value \( (i.e., \ P_{mp} = mL_{mp}) \):

\[ L_p = \frac{C}{m} = \frac{P_{mp}}{m} = \frac{mL_{mp}}{m} = L_{mp} \]

(5)

In Volume 1, Marx provisionally assumes that the price of the means of production is proportional to the labor "embodied" in them. Strictly speaking, the exact proportionality between price and labor-time applies only to the aggregate product; but since the prices of individual commodities are not analyzed in Volume 1, there is no basis for making any other assumption about these individual prices or about the price of any subset of the aggregate product, such as the means of production. In Volume 3, of course, it is determined that the prices of individual commodities will in general not be proportional to the labor embodied in them. In this case, the past abstract labor represented by the constant capital will not be equal to the labor embodied in the means of production. However, this inequality makes no difference in the quantity of money-value transferred from the means of production to the price of the final product. In either case, the value transferred is equal to the constant capital, which is taken as given. Other authors who have argued that the value transferred from the means of production to the price of the final product is equal to the price of the means of production, regardless of whether this price is proportional to the labor embodied in the means of production, include Carchedi (1984), Miatlo, Jr. (1981), Wolff et al. (1983), and Mage (1983, appendix A).

From this theory of aggregate price, Marx derives the aggregate amount of surplus-value \( (S) \) produced in a given period of time. This derivation may be briefly summarized algebraically as follows:

\[ S = P - K \]  
\[ P = C + N \]  
\[ K = C + V \]  
\[ S = (C + N) - (C + V) \]  
\[ = N - V \]  
\[ = mL_c - mL_n \]  
\[ = mL \]

(6)  
(7)  
(8)  
(9)  

where \( K \) stands for total costs of production, \( L_n \) for necessary labor-time or the time required for current labor to reproduce the equivalent of variable capital \( (= V/m) \), and \( L_c \) for surplus labor-time. The main points about this derivation for our purposes are: (1) the given in this theory are \( C \), \( V \), \( L_c \), and \( m \), as discussed above; (2) the aggregate amount of surplus-value is derived as a function of the aggregate amount of surplus labor; (3) the aggregate amount of surplus-value that is determined in this way is then taken as given in Marx's subsequent analysis of the distribution of surplus-
value and of prices of production in Volume 3, which is discussed in further detail in the next section.

**Theory of Prices of Production**

I first specify the quantities that are taken as given in Marx’s theory of prices of production. To begin with, as just discussed, the total quantity of surplus-value is taken as given, as determined by the prior analysis of capital in general, in keeping with Marx’s method of abstraction in which the conclusions of one level of abstraction are presupposed at later stages of the analysis. In this way, the analysis of the determinants of the aggregate surplus-value at the level of capital in general is a necessary “intermediate link” in the analysis of the distribution of surplus-value at the level of many capitals.

*In considering profit, surplus-value is assumed as given.* (Marx 1971b, 369; emphasis added)

Profit (profit of enterprise plus interest) and rent are nothing more than characteristic forms assumed by particular portions of the surplus-value in commodities. *The size of the surplus-value sets a quantitative limit for the parts it can be broken down into.* (Marx 1982, 971; emphasis added)

We have thus an absolute limit for the value component that forms surplus-value and can be broken down into profit and ground-rent; this is determined by the excess of the unpaid portion of the working day over its paid portion, i.e., by the value component of the total product in which this surplus labor is realized. If we call the surplus-value whose limits are thus determined profit, when it is calculated on the capital advanced, as we have already done, then this profit, considered in its absolute amount, is equal to the surplus-value, i.e., it is just as regularly determined in its limits as this is. (Marx 1982, 999; emphasis added)

These latter two quotations concern the division of surplus-value into industrial profit, interest, and rent, but the same methodological principle that the aggregate amount of profit is determined prior to the individual parts and sets the limit for the latter also applies to the division of surplus-value among individual branches of production.

Also taken as given in this analysis of prices of production is the general or average rate of profit, again as determined by the prior analysis of capital in general in Volume I. The general rate of profit is equal to the ratio of the aggregate surplus value to the aggregate capital.

The general rate of profit is formed through the total surplus-value being calculated on the total capital of society (of the class of capitalists). (Marx 1968b, 433)

This rate of profit, expressed in absolute terms, can be nothing else than the surplus-value produced (annually) by the capitalist class in relation to the total capital advanced by society as a whole. (Marx and Engels 1975b, 193)

The prerequisite [of prices of production] is the existence of a general rate of profit. (Marx 1982, 257)

Finally, the individual quantities of constant capital and variable capital invested in each industry are also taken as given, as quantities of money, in this analysis of prices of production. 11

The variable and constant capital consumed in the production of the commodities in each particular investment would be given. (Marx 1982, 259; emphasis added)

The two sums of these individual quantities of constant capital and variable capital obviously equal the aggregate quantities of constant capital and variable capital that are taken as given in the Volume I analysis of capital in general.

We now turn to Marx’s method of determining prices of production, based on these given quantities. According to Marx’s method, the determination of the prices of individual commodities is a simple and straightforward matter.

If the limits of value and surplus-value are given, it is easy to grasp how the competition of capitals transforms values into prices of production. (Marx 1982, 429)

According to Marx’s theory, individual commodities do not in general exchange at prices that are proportional to the labor-time contained in them. In other words, individual commodities do not exchange at prices that enable the capitalists in each industry to collect the exact amount of surplus-value produced in that industry. Instead, individual commodities tend to exchange at prices that enable capitalists in each branch to recover the capital consumed in production and to collect the average rate of profit on their total advanced capital. The average rate of profit is itself equal to the general rate of profit for the total capital, which, as stated above, is determined in the Volume I analysis of capital in general and presupposed in this analysis of the distribution of surplus-value. Marx calls the prices of individual commodities that provide such a proportional distribution of surplus-value among the individual industries the *prices of production* of commodities.

The determination of the price of production of each commodity is given by the equation:

\[ P_i = (C_i + V_i) + R M_i \]

(10)
where $P$, stands for price of production of each commodity, $C$, for the periodic flow of constant capital consumed in each industry, $V$, for the periodic flow of variable capital expended in each industry, $R$ for the general rate of profit, and $M$, for the total stock of money-capital advanced in each industry.

The amount of profit included in the price of each commodity ($= R M$) will in general not be equal to the amount of surplus-value actually contained in that commodity, and hence the price of production of each commodity will in general not be proportional to the labor-time required to produce it. However, the total amount of surplus-value is not altered by this redistribution of surplus-value among the individual industries according to the total amount of capital invested. Taken together, the divergences of individual profits from individual surplus-values balance out so that the sum of individual profits is equal to the total amount of surplus-value ($S$), as determined in the Volume 1 analysis of capital in general. This can be trivially shown as follows:

$$ E(RM) = RE(M) = RM = \frac{S}{M}, \quad M = S \quad (11) $$

where $E$ stands for summation.

Similarly, the sum of the prices of production of individual commodities is equal to the aggregate price of commodities, as determined in the Volume 1 analysis of capital in general:

$$ E(P) = E(C_i + V_i) + RM \quad (12) $$

$$ = E(C_i) + E(V_i) + RE(M) $$

$$ = C + V + S $$

$$ = C + N $$

$$ = P $$

Finally, in contrast to the neo-Ricardian interpretation, the general rate of profit obviously does not change in Marx's determination of prices of production, since it is taken as given in this analysis and not determined simultaneously along with the prices of production, as in the neo-Ricardian interpretation. According to Marx's method, there are not two rates of profit; there is only one rate of profit, the "price rate of profit," which is determined in the Volume 1 analysis of capital in general and is taken as given in the Volume 3 analysis of many capitals.

RESPONSE TO NEO-RICARDIAN CRITICISM

According to the neo-Ricardian interpretation, Marx’s analysis of the determination of prices of production summarized above is logically incomplete and contradictory because Marx failed to transform the amounts of constant capital and variable capital invested in each industry from value magnitudes to price magnitudes. This criticism began with Bortkiewicz:

[Marx] made the mistake of carrying over certain magnitudes without alteration from the table of values into that of prices. In transforming values into prices, it is inadmissible to exclude from the recalculation the constant and variable capital invested in the various spheres of production. (Bortkiewicz 1952, 9)

Sweezy repeated this criticism in his influential Theory of Capitalist Development:

The source of Marx’s error is not difficult to discover. In his price scheme, the capitalists’ outlays on constant and variable capital are left exactly as they were in the value scheme; in other words, the constant capital and variable capital used in production are still expressed in value terms. Now it is obvious that in a system in which price calculation is universal, both the capital used in production and the product itself must be expressed in price terms. The trouble is that Marx went only halfway in transforming values into prices. It need occasion no surprise that this procedure leads to contradictory results (Sweezy 1968, 115).

In the subsequent debate, it was concluded that it is possible to correct Marx’s “error” and to complete the transformation of the inputs of constant capital and variable capital from value magnitudes to price magnitudes. However, as discussed in the first section above, three important implications follow from this neo-Ricardian “solution”: (1) only one of Marx’s two aggregate equalities can in general hold at the same time; (2) the “price” rate of profit will not be equal to the “value” rate of profit; and (3) the Volume 1 analysis of the value system is “redundant” or an “unnecessary detour” because the same prices and rate of profit can be derived directly from the given technical conditions of production and real wage.

I argue that these criticisms are based on the neo-Ricardian interpretation of Marx’s theory, which assumes a different logical method from Marx’s own method, as discussed above. In particular, this criticism assumes a different method of determination of the individual quantities of constant capital and variable capital invested in each industry. According to the neo-Ricardian interpretation, the fundamental givens in Marx’s theory (as in linear production theory) are the physical quantities of the technical conditions of production and the real wage. According to this method, the quantities of constant capital and variable capital invested in each industry are derived from these given technical conditions and real wage. In Volume 1, the
quantities of constant capital are determined as the labor-values of the given means of production employed in each industry. In Volume 3, these quantities of constant capital in value terms are taken as given and then transformed into the corresponding prices of these same means of production. Thus, in the transition from Volume 1 to Volume 3, the quantity of the means of production remains the same (taken as given), but the quantity of constant capital derived from these given means of production changes. A similar method is followed for variable capital. Variable capital in each industry is first determined as the labor-values of the given wage goods and then transformed into the prices of these same wage goods. It is precisely these transformations of constant capital and variable capital from value magnitudes to price magnitudes that Marx is accused of having failed to make.

However, it has been argued above that, according to Marx’s method, the individual quantities of constant capital and variable capital invested in each industry are not derived from the technical conditions of production and the real wage, but are instead taken as given in money terms. In the Volume 1 analysis of capital in general, these quantities of constant capital and variable capital invested in each industry are not considered at all; more precisely, they are not determined as the labor-values of given quantities of means of production and wage goods in each industry. Only the aggregate quantities of constant capital and variable capital are considered in the Volume 1 analysis, and these aggregate quantities are taken as given. Thus the individual quantities of constant capital and variable capital in value terms cannot be taken as given in Volume 3, as determined in Volume 1, since they are not even analyzed in Volume 1. Instead, the individual quantities of constant capital and variable capital are taken as given in the subsequent Volume 3 analysis in price terms (i.e., as quantities of money). According to Marx’s method, these quantities of constant capital and variable capital do not need to be transformed from value terms into price terms; instead, they are already in price terms because they are taken as given in price terms. The transition from Volume 1 to Volume 3 is not a transition from labor-values to prices; it is a transition from aggregate prices to individual prices. Thus Marx did not “fail to transform the inputs” from values to prices. According to Marx’s method, there is no such transformation to be made. Carchedi (1984) and Mattick, Jr. (1981) also emphasize that the inputs of constant capital and variable capital are taken as given in price terms in the determination of prices of production and thus do not have to be transformed from value magnitudes to price magnitudes.

On the other hand, the quantities of means of production and wage goods that the given quantities of constant and variable capital will purchase will be different depending on whether or not the prices of the means of production and wage goods are proportional to their labor-values. For example, if the price of the means of production is greater than their price proportional to labor, then the given amount of money-constant capital will purchase a smaller quantity of means of production than if these two prices were equal. Similarly, if the price of wage goods is less than their price proportional to labor, then the given amount of variable capital will purchase a greater quantity of wage goods than if these two prices were equal (Marx 1973, 436–38).

Thus, Marx’s method is essentially the opposite of the neo-Ricardian interpretation: In moving from Volume 1 to Volume 3, Marx holds the money quantities of constant and variable capital invariant, and this transition results in changes in the physical quantities of means of production and wage goods that the given constant and variable capital will purchase. (This change does not refer to an actual change, but rather to a change from the hypothetical quantity of means of production and wage goods that the given constant and variable capital would purchase, if prices were proportional to their labor-values, to the actual quantity of means of production and wage goods that the given constant and variable capital actually purchase with prices not proportional to their labor-values.) The neo-Ricardian method, on the other hand, holds the quantities of means of production and wage goods invariant, and the transition to Volume 3 results in changes in the physical quantities of constant capital and variable capital (again, not an actual change). Thus the failure to transform the quantities of constant capital and variable capital can be a problem only within neo-Ricardian theory, but cannot be a problem for Marx’s theory.

It is often argued that although Marx failed to transform constant capital and variable capital from value terms to price terms, he explicitly acknowledged in a few passages that such a transformation should be made, but did not recognize the full implications of completing the transformation (e.g., Steedman 1977, 31–33). The passages most often cited in this regard are Marx 1982, 261, 265, 309. However, a reexamination of these passages from the perspective of Marx’s method as outlined above suggests an entirely different interpretation. As discussed above, the “value transferred” from the means of production to the price of the final product is equal to the given constant capital, or to the price of the means of production, whether or not this price is proportional to the labor-time embodied in the means of production. In these passages in Volume 3, Marx is simply calling attention to the fact that in Volume 1 he made the provisional assumption that the price of the means of production is proportional to the labor-time embodied in the means of production, but now that provisional assumption is dropped. However, this further determination of the price of the means of
production does not imply that the constant capital needs to be further transformed, because constant capital is not derived from the labor-time required to produce the means of production, but is instead taken as given. Nor does this further determination of the price of the means of production affect the value transferred from the means of production, which is equal to the given constant capital in either case. It simply means that the given constant capital and thus the value transferred is no longer assumed to be proportional to the labor-time embodied in the means of production.

Finally, the three important implications of the neo-Ricardian "solution" to the transformation problem discussed above do not follow from Marx's own logical method. As shown in the previous section, both of Marx's aggregate equalities are true simultaneously, and the determination of individual prices does not alter the rate of profit; instead the rate of profit is taken as given in the determination of individual prices. With respect to the third implication, the "redundancy" critique of the neo-Ricardians, it follows from the characteristics of Marx's logical method discussed above that the values of commodities, as defined by Marx, cannot be derived from the technical conditions of production, for two main reasons: First, Marx's concept of abstract labor differs from the current labor requirements included in the technical conditions of production because the latter do not take into account different skills and different intensities of labor. Second, the "past labor" represented by constant capital is in general not equal to the labor "embodied" in the means of production. Therefore, the values of commodities, as defined by Marx, are not an "unnecessary detour" from the technical conditions of production to the prices of commodities, but are instead an indispensable assumption in Marx's theory of profit.12

COMPARISON WITH THE "NEW SOLUTION" TO THE TRANSFORMATION PROBLEM

In recent years, a "new solution" to the transformation problem has emerged that occupies a sort of middle ground between the neo-Ricardian interpretation and the interpretation presented here. This new solution was originally presented independently by Foley (1982), Dumenil (1980, 1983), and Lipietz (1982) and has gained increasing attention and acceptance among Marxian and radical economists (although no doubt it is still a minority view). This section briefly reviews a few important points of this new solution and contrasts it with the interpretation presented here.

The main similarity between the new solution and the interpretation presented here is that the new solution also takes variable capital as given in money terms, rather than deriving variable capital from a given quantity of wage goods, as in the neo-Ricardian interpretation. This given quantity of variable capital in money terms remains invariant in the transition from Volume I to Volume 3. The justification for this interpretation is not made in terms of Marx's logical method; instead it is argued that this assumption provides a more accurate representation of the actual exchange relation between capitalists and workers in capitalist society.

Workers in capitalist society do not bargain for, or receive, a bundle of commodities as payment for the labor power, they receive a sum of money, the money wage, which they are then free to spend as they wish. (Foley 1982, 43)

Foley also argues that this interpretation also provides a better understanding of the specific nature of exploitation in capitalism and of the nature of the class struggle between capitalists and workers. He believes that this interpretation enables one to perceive that capitalist exploitation is not identical with the existence of a surplus product and that the goal of workers' struggles should not be the elimination of the surplus product per se, but should instead be the elimination of the social relations of capitalism in which the surplus product is appropriated in the form of surplus-value by capitalists.

This new solution also redefines the aggregate price equality to refer to the net price of the total product rather than the gross price. It follows from this interpretation (and the assumption of a given money wage) that this redefined aggregate price equality and the aggregate profit equality can both hold at the same time.

However, this new solution treats constant capital differently from variable capital. It does not take constant capital as given in money terms, but instead derives constant capital from a given quantity of means of production, as in the neo-Ricardian interpretation. Thus the magnitude of constant capital will change in the transformation from values to prices, as in the neo-Ricardian interpretation. Since the magnitude of constant capital changes, the total price of commodities will not be proportional to the total labor value of commodities, and the "price" rate of profit will not be equal to the "value" rate of profit, again as in the neo-Ricardian interpretation.

Thus there is a methodological inconsistency in this new solution in its treatment of constant capital and variable capital. Variable capital is taken as given in money terms, but constant capital is derived from given physical quantities. Proponents of this view do not provide a rationale for this inconsistent treatment. I argue that since both constant capital and variable capital are components of the total capital invested by capitalists, these two components should be treated in parallel fashion. Either they both should be
taken as given in money terms, as in Marx's theory, or they both should be derived from given physical quantities, as in linear production theory.

At one point, Foley seems to present a general argument for taking as given all the money-capital invested in capitalist firms (both constant capital and variable capital), rather than taking as given "the production and distribution of use-values":

One striking difference between Marx's treatment of the problem and later treatments is that Marx describes the two economies solely in terms of the accounts of the capitalist firms; he does not specify the actual production and distribution of use-values. Later treatments, perhaps in the name of theoretical rigor, describe both economies in terms of the production and distribution of particular use-values, and derive the accounts of the capitalist firms from this assumed data on production and distribution. When one holds constant the production and distribution of use-values, it turns out that... aggregate value added and aggregate profit cannot both be the same in the two [economies].

I want to suggest that Marx had good theoretical reasons for describing the two economies in terms of the accounts of the capitalist firms rather than in terms of the production and distribution of use-values. The social facts relevant to struggle and change in a capitalist society concern the production and distribution of value itself, and the actual production, distribution, and consumption of use-values that follow from these struggles take a secondary place. (Foley 1982, 44–45)

It seems to me that Foley's argument could be applied to constant capital as well as to variable capital. However, Foley applies it only to variable capital, that is, only to the distribution of use-values. He does not apply it to constant capital or the production of use-values.

I have argued above that, according to Marx's method, both constant capital and variable capital are taken as given in terms of money. This argument is based on (1) Marx's formula for the circulation of capital, $M\rightarrow C\rightarrow M'$, which is the general analytical framework for Marx's theory and which begins with a given sum of money; (2) the logical relation between Parts 1, 2, and 3 of Volume 1 of Capital, according to which the development of the concepts of money and capital in Parts 1 and 2 provide the logical presuppositions for the analysis of surplus-value in Part 3 and beyond; and (3) the numerous passages in which Marx states that the quantity of the initial money-capital is presupposed in his theory of surplus-value. Those who accept this new solution should provide an explanation for their different treatments of constant capital and variable capital and should either refute the above three points or show how they are consistent with their interpretation.

CONCLUSION

This chapter has argued that the prevailing neo-Ricardian interpretation attributes to Marx's theory a logical method (the method of linear production theory) that is fundamentally different from Marx's own method. The two main differences discussed were the order of determination between aggregate magnitudes and individual magnitudes and the nature of the givens or presuppositions in Marx's theory. This chapter has argued further that, if Marx's method is followed, then his determination of prices of production in Volume 3 of Capital is not logically flawed as the neo-Ricardians claim. Both of Marx's two aggregate equalities (aggregate price equals aggregate value, and aggregate profit equals aggregate surplus-value) follow as necessary conclusions of this method. And, finally, the rate of profit does not change as a result of this determination of prices of production. Thus the long line of neo-Ricardian literature on Marx's "transformation problem," from Bortkiewicz on, does not in fact apply to Marx's theory, but instead applies only to linear production theory, or to the misguided attempt to interpret Marx's theory in terms of linear production theory.

I have not argued that Marx's theory is necessarily superior to linear production theory. The relative explanatory power of these two theories is beyond the scope of this chapter, but this is obviously the next question that should be addressed. However, a meaningful evaluation of the relative merits of these two theories is not possible without first gaining a clear understanding of the uniqueness of Marx's theory and its differences from linear production theory. The purpose of this chapter has been to contribute to such an understanding of Marx's theory.

Notes

I benefited greatly from the discussion of my paper at the conference on Marx's method in Capital (Mount Holyoke College, 3–7 June 1991). I have also benefited very much from ongoing discussions over the past several years with Paul Mattick, Mino Carchedi, and Geert Reuten, although they do not agree with all the views expressed here and are certainly not responsible for any remaining errors.

1. My interpretation of Marx's distinction between capital in general and many capitals draws heavily from the work of Mattick, Sr. 1959, 1969, and Rosdolsky 1977.

2. Parts 1 and 3 of Volume 3 remain at the level of abstraction of capital in general. Volume 2 is also at the level of abstraction of capital in general. Volume 2 analyzes the various characteristics that are shared by all capitals that grow out of the process of circulation, as distinct from the process of production.
3. We can see from Marx's methodological distinction between capital in general and many capitals that the "successive approximations" interpretation of Marx's method, adopted by Sweezy and many others, is erroneous. According to the successive approximations interpretation, Volume 1 of Capital makes the simplifying assumptions that the prices of individual commodities are equal (or proportional) to their values, and the composition of capital in all industries is equal. Then in Volume 3, unequal compositions of capital are introduced, and a more realistic theory of prices is developed. The rate of profit is also determined simultaneously with prices in this Volume 3 analysis, similar to the linear production interpretation of Marx's method.

However, according to Marx's distinction between capital in general and many capitals, the Volume 1 analysis of capital in general disregards altogether the prices of individual commodities and the compositions of individual capitals. No assumption is made about the equality of individual compositions of capital, because individual capitals do not yet enter into the analysis. Farther, the logical transition to Volume 3 is not marked by a change of assumption with regard to the composition of individual capitals, but is instead marked by a shift in the level of abstraction from capital in general to many capitals, in which individual phenomena, such as the composition of individual capitals, are considered for the first time. Finally, the total amount of profit and the general rate of profit are taken as given in the Volume 3 analysis of the distribution of surplus-value and the determination of individual prices, as will be discussed in the following section.

For a further discussion of the successive approximations interpretation of Marx's method, see Moseley 1982, ch. 1.

4. Note that Marx does not suggest here (or anywhere else) the simplifying assumption of equal compositions for all capitals. Instead, in his analysis of capital in general, Marx abstracts from individual capitals and their compositions altogether and promises to take them into account at a later stage of the analysis.

5. Ricardo's followers (James Mill, James McCulloch, Thomas DeQuincey, and others) continued to attempt to deduce the particular phenomena of capitalism directly from the law of value, without success. Marx discusses these "pitiful" attempts in detail in Chapter 20 of Volume 3 of "Theories of Surplus-Value" ("The Disintegration of the Ricardian School"). See especially pp. 71, 86–88, and 190.

6. Carchedi was one of the first, along with Mattick, Jr. (1981), to emphasize that, contrary to the prevailing neo-Ricardian interpretation, constant capital and variable capital in Marx's theory are taken as given in terms of money. To my knowledge, no neo-Ricardian author has answered Carchedi's arguments.


8. Marx usually assumed for purposes of illustration that m = 0.5 shillings per hour.

9. Marx himself illustrated his theory of surplus-value with numerical examples and did not present a general algebraic formulation.

10. For Marx's definitions of necessary labor-time and surplus labor-time, see Marx 1977a, 524–27.

11. Like the aggregate constant capital discussed above, these individual quantities of constant capital are taken as given in terms of the current replacement costs, not the actual historical costs, of the existing means of production.

12. Other neo-Ricardian criticisms of Marx's theory of value—e.g., that in the case