

# The Circulation of Capital

Essays on Volume Two of Marx's *Capital*

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### Marx's Reproduction Schemes and Smith's Dogma

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The best-known part of Volume Two of *Capital* is the reproduction schemes in Part Three. Marx's reproduction schemes have been widely interpreted to be essentially the same as Leontief input-output tables, or the technology matrices in Sraffian theory or in neo-classical growth theory (for example, Lange, 1969; Morishima, 1973; Howard and King, 1985; Gehrke and Kurz, 1995). These technology matrices consist of physical quantities of inputs and outputs for the various sectors in the economy. According to this interpretation, Marx's reproduction tables also consist fundamentally of physical quantities of inputs and outputs, which are aggregated into departments by means of labor values. The main purpose of Marx's reproduction tables, according to this interpretation, is to analyze the conditions for balanced growth, or the proportions between the physical inputs and outputs of the different sectors of the economy which are necessary for balanced growth to occur.

This interpretation of Marx's reproduction tables has been one of the main supports for the currently dominant neo-Ricardian interpretation of Marx's theory of value and price, according to which the logical method of Marx's theory is essentially the same as the logical method of Sraffa's theory that is, the method of linear production theory. Specifically, according to this interpretation, Marx's theory takes as given the physical quantities of inputs and outputs, as in Marx's reproduction tables, and then derives values and prices from these given technical coefficients of production. (Gehrke and Kurz emphasize this connection between Marx's reproduction tables and his theory of value and price.)

This paper argues that this widespread interpretation of Marx's reproduction tables is fundamentally mistaken and that Marx's reproduction tables do not consist of physical quantities of inputs and outputs, but instead consist of quantities of *money*, money which circulates as capital or as revenue.<sup>1</sup> These quantities of money capital do not serve as a means to aggregate physical inputs and outputs, but rather are themselves the subject of the analysis, as quantities of money capital. The primary purpose of Marx's reproduction tables is not to analyze balanced growth in terms of physical quantities of inputs and outputs, but is instead to analyze the reproduction of quantities of *money capital*, that is to explain how the money which is invested as capital is later recovered, so that means of production and labor power can be purchased again and capitalist production can continue on the same scale (at least). Marx's analysis of this question has nothing essential to do with the physical quantities of inputs and outputs, but instead has to do with the advance, recovery and reproduction of different components of money capital throughout the capitalist economy through the purchase and sale of commodities.

It will be argued that the most important immediate purpose of Marx's reproduction tables was to refute the widely-held, but erroneous, view of Adam Smith that the price of the total social product is entirely resolved into revenue, that is, into wages plus profit and rent.<sup>2</sup> 'Smith's dogma' (as Marx called it) and Marx's refutation of it do not depend in any way on the specification of the physical quantities of inputs and outputs. Instead they have to do with the components of the *price* of commodities, and especially with the question of how the *money capital* invested as constant capital in the means of production is recovered through the sale of commodities. The key issue is whether the total price of the total social product is entirely resolved into revenue or also includes a constant capital component. All these variables – price, capital, revenue and so on – are defined in units of money and are not derived in any way from given technical conditions of production.<sup>3</sup>

In order to demonstrate these conclusions, this paper re-examines the following texts in which Marx discussed his reproduction tables and related subjects: (1) an important 1863 letter to Engels, which was apparently Marx's first presentation of his reproduction tables (at least it is the earliest discussion which has been published in English, and I think in any other language); (2) Chapters 3 and 6 of Volume One of *Theories of Surplus-Value*,

written in 1862, in which Marx discussed Smith's dogma and Quesnay's *Tableau Économique*; (3) Chapter 49 of Volume Three of *Capital*, written in 1865; and (4) the best known and most extensive discussion of Marx's reproduction tables in Part Three of Volume Two of *Capital*, written in the 1870s.

The title of Part Two of Volume Three of *Capital* is 'The Reproduction of the Total Social Capital', thus indicating that Marx's reproduction tables analyze the reproduction and circulation of *capital*. Therefore it is necessary first of all briefly to review Marx's definition of capital and the related definition of revenue.

#### MARX'S DEFINITION OF CAPITAL IN TERMS OF MONEY

Marx first defined his concept of capital in Part Two of Volume One of *Capital*, which is entitled 'The Transformation of Money into Capital'. In Chapter 4, Marx defined capital as *money which becomes more money* through the purchase and sale of commodities, and he expressed this definition symbolically as  $M-C-M'$ , where  $M' = M + \Delta M$ . Surplus value is also defined as the increment of money ( $\Delta M$ ) which emerges through this circulation of capital. The chapters that follow argue that the source of this surplus value, the increment of money which transforms a sum of money into capital, is the surplus labor of workers engaged in production.

Later in Volume One, in the introduction to Part Seven, Marx summarized his definition of the *circulation of capital*, which includes, besides the two phases just mentioned, a third phase which is a return to the sphere of circulation in order to sell the products. This summary is as follows:

The transformation of a sum of money into means of production and labor-power is the first phase of the movement undergone by the quantum of value which is going to function as capital. It takes place in the market, in the sphere of circulation. The second phase of the movement, the process of production, is complete as soon as the means of production have been converted into commodities whose value exceeds that of their component parts, and therefore contains the capital originally advanced plus a surplus-value. These commodities must then be thrown back into the sphere of circulation. They must be sold, their value must be realized in money, this money must be transformed once again into

capital, and so on, again and again. This cycle, in which the same phases are continually gone through in succession, forms the circulation of capital. (C.I. 709)<sup>4</sup>

Thus we see that Marx defined capital as money which becomes more money through the production and sale of commodities, and the circulation of capital as the continual repetition of the three phases of purchase, production and sale just described. Therefore Marx's title for Part 3 of Volume Two, 'the reproduction of the total social capital', means the reproduction of *money which functions as capital*.

Since capital is defined in terms of money, the two key components into which the total capital is divided, constant capital and variable capital, are also defined in terms of money (C.I., ch. 8). Thus, the magnitudes of constant capital, variable capital and surplus value in departments I and II in Marx's reproduction tables are defined in terms of money, not in terms of physical inputs and output, as suggested by the neo-Ricardian interpretation.

It should be noted that Marx did not define capital as the physical means of production, as the classical economists tended to do and as neo-classical economists do today. Marx extensively criticized the classical concept of capital as physical means of production (for example, C.I., 975–1010). He argued that this definition of capital is an example of the tendency of the classical economists to define their concepts in physical terms, which are common to all types of economic systems, rather than in terms of those characteristics which are historically specific to capitalism, that is, the investment of money to make more money.

Modern economists deride the simple-mindedness of the monetary system when it responds to the question: What is money? with the answer: gold and silver. But these self-same economists do not blush to respond to the question: What is capital? with the reply: Capital is cotton. Yet this is what they do when they declare that ... the *material conditions of labor are capital* by their very nature, and that they are capital because, and to the extent that, they participate in the labor process by virtue of their physical qualities as use-values. It is in order, if others add to their list: Capital is meat and bread, for even though the capitalist purchases labor-power with money, this money in fact only represents ... the means of subsistence of the worker. (C.I., 996)

This is the reason, then, why the capitalist, the worker, and the political economist, who is only capable of conceiving the labor process as a process owned by capital, all think of the *physical* elements of the labor process as *capital* just because of their physical characteristics. This is why they are incapable of detaching their physical existence as mere elements in the labor process from the *social* characteristics amalgamated with it, which is what really makes them *capital*. (C.I., 1007–8; emphasis in the original)

Marx's definition of capital in terms of money, rather than physical means of production, follows from his general methodological principle of *historical specificity*, according to which the concepts of a theory of capitalism should refer to its historically specific and unique characteristics, because it is these characteristics which determine the development of capitalism, not the general and common characteristics which capitalism shares with all other economic systems, such as the production of outputs by means of inputs (see for example, G., 85–8).<sup>5</sup>

Money which functions as capital was distinguished by Marx from money which functions as revenue in the following way. We have just seen that capital is defined as money advanced to purchase means of production and labor power to be used to produce a commodity and eventually to recover a greater sum of money. On the other hand, revenue is defined as money used to purchase means of consumption for purposes of individual consumption. This distinction, which Marx credited Quesnay for being the first to emphasize (TSV.I., 344), plays an important role in Marx's analysis of reproduction and in his critique of Smith's dogma. Smith argued that the price of the total social product is entirely resolved into revenue; Marx argued to the contrary that the price of the total social product also includes a component of capital, and must include a component of capital if capitalist production is to be able to reproduce itself.

#### 1863 LETTER TO ENGELS

The first time that Marx presented a version of his reproduction tables was in a letter to Engels written on 6 July 1863 (SC., 132–6), soon after he had finished the '1861–3 Manuscript', the second draft of *Capital*, which will be discussed in the next section. There is no

discussion of the reproduction tables in the *Grundrisse*, even though there are extensive discussions of other parts of what later became Parts one and Two of Volume Two of *Capital*.

In this letter, Marx asked Engels to look over an 'Economic Table' which he said he had adapted from Quesnay's *Tableau Économique* and which he enclosed in the letter. Marx introduced his 'Economic Table' as follows:

You know that according to Adam Smith, the 'natural price' or 'necessary price' is composed of wages, profit (interest), rent – and is thus entirely resolved into *revenue*. This nonsense was taken over by Ricardo, although he excludes rent, as merely accidental, from the list. Nearly *all* economists have accepted this from Smith and those who combat it commit some other imbecility.

Smith himself is aware of the absurdity of resolving the *total product* of society merely into *revenue* (which can be annually consumed), whereas in *every separate* branch of production he resolves price into *capital* (raw materials, machinery, etc.) and *revenue* (wages, profit, rent). According to this, society would have to start afresh, *without capital*, every year. (SC., 133; emphasis in the original)

This passage and the rest of the letter make it clear that Marx's 'Economic Table' was originally intended to provide a critique of Smith's erroneous view that the price of the total commodity product of society is entirely resolved into wages, profit and rent; that is, that price is entirely resolved into revenue (under the assumption that all the profit is consumed rather than accumulated – which was both Smith's and Marx's assumption in this context).

Marx then explained the contents and logic of the reproduction table to Engels. He divided the whole economy into two broad 'categories': Category 1 which produces means of subsistence and Category 2 which produces means of production.<sup>6</sup> He began his discussion with Category 1, the means of subsistence. The price of the product of Category 1 includes both a *capital* component (constant capital) equal to the costs of the means of production consumed in the production of means of subsistence and a *revenue* component equal to variable capital plus surplus value. Therefore, the price of the product of Category 1 cannot be resolved entirely into revenue within Category 1.

On the assumption that capitalists spend all their profit on means of subsistence (that is, the assumption of 'simple reproduction'), the capitalists in Category 1 are able to sell part of their means of subsistence to workers and capitalists *within* Category 1. However another part of the means of subsistence remains unsold and the capitalists in Category 1 have not yet recovered the constant capital spent on the means of production. Therefore the following questions arise: who buys the remaining means of subsistence of Category 1 and how is the constant capital invested in Category 1 recovered, so that the means of production in Category 1 can be repurchased and production can continue on the same scale in the next period?

The answers to these questions involve the relations of exchange between Category 1 and Category 2. The price of the product of Category 2 also includes both a *capital* component (constant capital) and a *revenue* component, equal to variable capital plus surplus value. The additional buyers for the products of Category 1 are the workers and capitalists in Category 2, who spend their wages and surplus value to purchase means of subsistence, thereby enabling the capitalists in Category 1 to recover their constant capital invested.

However, after this purchase of means of subsistence by the workers and capitalists in Category 2, all the revenue of society has been expended to purchase the means of subsistence produced by Category 1. If Smith's view were correct, and the total price were entirely resolved into revenue, who would buy the means of production produced by Category 2, and with what money? The total revenue of society has been expended and yet the means of production have not yet been sold. Similarly, if Smith's view were correct, how could the means of production consumed in both categories be replaced, since there would be no money left over with which to purchase these means of production? As Marx put it in the passage quoted above, 'According to this, society would have to start afresh, *without capital*, every year' (SC., 133).

Marx's answer to this question was of course that Smith's view must be wrong. The total price of the total social product is resolved, just like the price of each individual commodity and the price of each category of goods, not only into revenue, but also into constant capital. This constant capital component of the price of commodities enables capitalists in both categories to recover the constant capital consumed in production, which in turn enables

them to repurchase their consumed means of production. Once it is recognized that the total price of the total social product is resolved into both constant capital and revenue, it is easy to explain how constant capital is recovered and how the means of production are repurchased in both categories so that production can continue on the same scale.

Marx commented toward the end of this letter: 'The movement, partly within Category 1, partly between Categories I and II, shows at the same time how the *money* with which they pay new wages, interest, and rent of land, flows back to the respective capitalists of both categories' (SC., 135; emphasis added). This theme of the 'reflux of money' was also emphasized by Marx in his later writings on reproduction and again clearly indicates that the quantities in Marx's reproduction tables are quantities of money capital, and that Marx's analysis of reproduction has to do with the way the quantities of money capital invested are recovered by the different groups of capitalists, so that this money capital can be reinvested and capitalist production can continue uninterrupted.

Therefore Marx demonstrated by means of his economic table that Smith's view was erroneous: that the total price of the total social product cannot be resolved entirely into revenue, but must also include a component of constant capital. Without this constant capital component of the price of commodities, there would be no way for capitalists to recover the constant capital invested, nor for them to repurchase the consumed means of production.

#### THE 1861-3 MANUSCRIPT

The use of an adaptation of Quesnay's *Tableau Économique* to refute Smith's dogma appears to have developed out of Marx's discussion of Smith and Quesnay in the '1861-3 Manuscript', in sections of this manuscript published in Volume One of *Theories of Surplus Value*. These sections were written in early 1862, about a year before the letter to Engels just discussed.

#### Smith

Marx discussed Smith's dogma for the first time in Chapter 3, Sections 8 and 10, of *Theories of Surplus-Value*. Section 8 is a brief introduction and Section 10 is a much longer discussion. These sec-

tions focus on the same questions emphasized in the 1863 letter to Engels just discussed: how is the constant capital consumed in production recovered, so that the consumed means of production can be repurchased? However the discussion in these sections is much less clear than in the letter to Engels, and Quesnay's *Tableau Économique* is not explicitly mentioned. Marx had apparently not yet hit upon the idea of using the *Tableau Économique* to demonstrate Smith's error.

In Section 10, Marx distinguished between the same two broad categories of producers as in the 1863 letter, but he did not aggregate all the individual capitals into totals for these two categories, as he did in the 1863 letter and in his later writings on this subject. This lack of aggregation reflects Marx's lack of clarity at this early point in time and makes the numerical examples overly detailed and tedious to follow. But it is nonetheless clear that the quantities of individual capitals discussed are defined in terms of money, not in terms of physical quantities of inputs and outputs.

As in the 1863 letter, Marx began his analysis in Section 10 with the producers of consumption goods (subsection (a), 'Impossibility of the Replacement of the Constant Capital of the Producers of Consumption Goods through Exchange between these Producers', pp. 107-25). Using a long, detailed argument, Marx showed that, since the sum of wages plus profit for these producers is always less than the sum of the prices of their products, it is always impossible for these producers to sell all their consumption goods through exchanges among themselves and their workers. There will always remain a surplus of unsold consumption goods whose price is equal to the sum of the constant capital consumed by these producers. This surplus of unsold consumption goods means that these producers will not be able to recover their constant capital, and hence will not be able to repurchase their consumed means of production.

In the next subsection (subsection (b), 'Impossibility of Replacing the Whole Constant Capital of Society by Means of Exchange between the Producers of Articles of Consumption and the Producers of Means of Production', pp. 25-38), Marx considered exchanges between producers of consumption goods and producers of means of production. Using another long, detailed argument, Marx showed that, while the revenue of the producers of the means of production (wages plus profit) may be sufficient to purchase all the articles of consumption, no revenue is left over to purchase

their own products, the means of production. On the basis of Smith's view, it would be impossible for both groups of capitalists to recover their constant capital, and hence it would be impossible for them to repurchase their consumed means of production. Therefore Marx came to the same conclusion as in the 1863 letter: that Smith's view must be wrong. The total price of the total social product consists, not only of revenue, but also of a second 'capital' component which is equal to the prices of the consumed means of production and which enable capitalists to recover the constant capital consumed and to repurchase the consumed means of production.

Marx did not present in this section his own analysis of the reproduction of the total social capital and a complete solution to the problems that arise from Smith's false assertion. Marx was evidently not yet sufficiently clear in his own mind to present his own analysis, especially in concise form. But he did note toward the end of this section that 'we shall return to this question in connection with the circulation of capital' (TSV.I. 147), thus indicating the relation between his critique of Smith's dogma and his analysis of the circulation and reproduction of capital in Volume Two of *Capital*.

### Quesnay

A few months later, Marx discussed Quesnay's *Tableau Économique* for the first time in his writings that have been published (TSV.I., ch. 6). (Marx did not mention the *Tableau Économique* in his earlier discussion of the Physiocrats in this manuscript (TSV.I, ch. 2) prior to his discussion of Smith.) The discussion of Quesnay's *Tableau Économique* was written in a separate notebook and labelled a 'Digression' (MECW.31., 590-91). It is not entirely clear why Marx returned to Quesnay after his discussion of Smith. Perhaps his discussion of Smith's dogma helped Marx to realize that Quesnay's *Tableau Économique* could be used to demonstrate Smith's error, and that is why he returned to Quesnay.<sup>7</sup> Although Smith's error is not explicitly mentioned in this discussion of Quesnay, the themes discussed are clearly related to the prior discussion of Smith's dogma. Marx reviewed in detail the various transactions in Quesnay's tableau, emphasizing the distinction between capital and revenue, and the related distinction between productive consumption (purchase of means of production and labor power) and final consumption (purchase of means of subsistence). Other themes discussed in this chapter include the recovery of the constant capital in agricul-

ture and manufacturing, thus enabling capitalists in both sectors to repurchase their consumed means of production; the 'reflux of money' to capitalists; and the determination of the quantity of money by the circulation of commodities and capital (in opposition to the quantity theory of money). All themes are related to quantities of money and do not depend in any way on the physical quantities of inputs and outputs.

Perhaps this further study of Quesnay helped Marx to realize that the *Tableau Économique* could be used to demonstrate the error of Smith's dogma. In any case, as we have already seen, this connection was clearly in Marx's mind by the time of his letter to Engels a year later.

### VOLUME 3, CHAPTER 49 OF CAPITAL

Volume Three of *Capital* was written in 1864-5, before Volume Two as we know it. Chapter 49 is the only place in Volume Three where Marx explicitly discussed his reproduction tables.<sup>8</sup> This chapter of course logically follows Part Three of Volume Two, to be discussed below, even though it was written before it. This chapter is once again about Smith's dogma and Smith's related 'cost-of-production' theory of value. The questions posed are the same as in Marx's earlier discussions: if Smith's dogma were true, how could the constant capital consumed in production be recovered and how would the means of production be replaced so that production could be continued on the same scale? Marx states his reasons for 'returning' to this analysis of reproduction and Smith's dogma as follows:

We can see that the problem posed here was already solved when we dealt with the reproduction of the total social capital, in Volume 2, Part 3. We come back to it here firstly because there surplus-value was not yet developed in its forms of revenue – profit (profit of enterprises plus interest) and rent – and hence could not be dealt with in these forms; and secondly because it is precisely in connection with the form of wages, profit, and rent that an incredible blunder has run through the analysis of all political economy since Adam Smith. (C.III., 975)

This chapter provides further evidence that Marx's analysis of the reproduction of social capital was concerned primarily with a

refutation of Smith's dogma, which has to do with the components of the price of commodities and which does not depend in any way on the specification of the quantitative relationships between physical quantities of inputs and outputs.

## VOLUME TWO, PART THREE, OF CAPITAL

We come finally to the best-known and most extensive discussion of Marx's reproduction tables in Part Three of Volume Two of *Capital*, which will be discussed in some detail, chapter by chapter and section by section.

### Chapter 18 ('Introduction')

Chapter 18 is a brief introductory chapter which consists of two sections. In Section 1 ('The Object of the Inquiry'), the reproduction and circulation of the total social capital is defined in essentially the same way as discussed above, that is, as the *continual repetition of the three phases of the circulation of capital*: (1) the purchase of means of production and labor power with money capital in the sphere of circulation; (2) the production process; and (3) the sale of the product (reconversion into money) once again in the sphere of circulation. Smith's dogma is not specifically mentioned in this brief introduction. However the significance of Smith's dogma for Marx's discussion of the reproduction of the total social capital is emphasized in the next two chapters.

Marx noted that Section 2 of Chapter 18 ('The Role of Money Capital') did not really belong in the introduction. The two main points briefly discussed are that the circulation of capital begins with money; and that the amount of money which must be advanced to maintain a given scale of production depends on the length of the turnover period (a point already discussed in Part Two of Volume Two). The main point for our purposes is that this section provides further evidence that Marx's reproduction tables are in terms of flows of money capital.

### Chapter 19 ('Former Presentations of the Subject')

This chapter is devoted almost entirely to a discussion of Smith's dogma (all but a very brief discussion of Quesnay's *Tableau*

*Économique*) and thus provides important evidence that one of the main purposes of Marx's reproduction tables was to refute Smith's dogma. The main issues emphasized in this chapter are the same as those in previous discussions of Smith's dogma, which we have examined above: the recovery of the constant capital and the distinction between capital and revenue. Marx summarized his critique as follows: 'The narrowness of Smith's conception lies in his failure to see what Quesnay had already seen, namely *the reappearance of the value of the constant capital in a renewed form* (C.II., 438; emphasis added).

This chapter also discusses two additional issues: that variable capital does not become revenue for workers (to be discussed below) and that, although price can be partially resolved into revenue, price is not *determined by* revenue in any way, contrary again to Smith's cost of production theory of value.

The final subsection of this chapter is a consideration of 'Later Writers' (Ricardo, Say and Ramsay) and the main point is that these later classical economists all accepted Smith's dogma. On Ricardo, Marx commented, 'Ricardo reproduced Adam Smith almost verbatim' (C.II., 465). Marx concluded this discussion of the 'former presentations of the subject' with the following summary statement: 'The result is that Smith's confusion persists to this day, and his dogma forms an article of orthodox belief in political economy' (C.II., 467). Surely this chapter provides strong evidence that the main purpose of Marx's reproduction tables was to refute once and for all Smith's dogma, this 'article of faith' in classical economics.

### Chapter 20 ('Simple Reproduction')

Chapter 20 begins with another short introductory section entitled 'Formulation of the Problem'. In this section, there is the following succinct statement of the problem to be investigated: 'The immediate form in which the problem presents itself is this. How is the *capital consumed in production replaced in its value out of the annual product*, and how is the movement of this replacement intertwined with the consumption of surplus-value by the capitalists and of wages by workers?' (C.II., 469; emphasis added). This question was the focus of Marx's previous discussions of Smith's dogma and is clearly concerned with flows of money, money which functions as capital and money which functions as revenue.

In this introduction, Marx also emphasized that the reproduction of the total social money capital also involves the reproduction of the material elements of production, especially the means of production.

For our present purposes, in fact, the process of reproduction has to be considered from the standpoint of the replacement of the individual components of *C'* both in value and in material. (C.II., 469)

The movement is not only a replacement of values, but a replacement of materials, and is therefore conditioned not just by the mutual relations of the value components of the social product, but equally by their use-values, their material shape. (C.II., 470)

These passages have often been interpreted to support the neo-Ricardian interpretation that Marx's reproduction tables are defined fundamentally in terms of the physical quantities of inputs and outputs, similar to Leontief or Sraffian input-outputs matrices. However, it should be clear from all that has been discussed above and will be discussed below that the primary purpose of Marx's analysis of the reproduction of social capital was to refute Smith's dogma by analyzing the reproduction of the various components of *money capital*. The key argument in Marx's refutation is that, if Smith's dogma were true and the total price of the total commodity product were resolved entirely into revenue, then the constant-capital consumed could not be recovered, from which it follows that the physical means of production could not be repurchased and production could not continue on the same scale. This is the primary sense in which Marx's analysis of reproduction of capital is also concerned with the reproduction of use-values: *the necessity to reproduce the physical means of production means that Smith's dogma cannot be true*. If the total price were entirely resolved into revenue, then there would be no money with which to repurchase the consumed means of production.

A second sense in which Marx's analysis of reproduction is concerned with the reproduction of use-values, to be developed below, is the possibility of disruptions which result from the fact that some of the physical means of productions (machines and so on) are not replaced every year, but only after a number of years. Neither one of these points regarding the reproduction of use-values requires

the specification of the physical quantities of inputs and outputs. Marx's analysis of the reproduction of capital is not concerned with the physical quantities of inputs and outputs, except as related to the reproduction of money capital. Indeed Marx's analysis demonstrates that *the reproduction of use-values in capitalism is dependent on the reproduction of money capital*, especially in the specific sense that the reproduction of the physical means of production depends on the reproduction of the constant-capital. The reproduction of use-values in capitalism has its own unique characteristics which can only be analyzed in terms of the reproduction of money capital. As Marx expressed this point, 'If production has a capitalist form, so too will reproduction' (C.I., 711).

Marx also noted in this introduction that his analysis of the reproduction of the total social capital assumes that the prices of individual commodities are proportional to their values (C.II., 469). However, he commented that, even if prices diverged from their values, 'this circumstance cannot exert any influence on the movement of the social capital' (C.II., 469). In other words, even if the prices of individual commodities diverged from their values, the main conclusions of Marx's analysis of the reproduction of the total social capital – that Smith's dogma must be wrong (that is, that the price of the product of the total social capital must contain a component of constant capital in addition to revenue) and that the discontinuity of investment in fixed capital is a possible source of disruptions in the reproduction of capital (to be discussed below) – would still follow without modification.

As we have seen, Marx returned to the subject of the reproduction of social capital in Chapter 49 of Volume Three of *Capital*, after prices of production had been derived in Part 2 of Volume Three. Hence, if individual prices differing from their values made any difference in the analysis of reproduction, Marx presumably would have dropped this assumption and examined these differences in this chapter. Instead Marx stated at the beginning of the chapter that he would continue to ignore the distinction between values and prices of production because this distinction has no effect on the reproduction of the total social capital: 'For the analysis that follows, we can ignore the distinction between value and price of production, since this distinction disappears whenever we are concerned with the value of labor's total annual product, i.e. with the value of the product of the total social capital' (C.III., 971). Marx's emphasis in this chapter, as we have seen, was once again on the



critique of Smith's dogma. This critique does not depend in any way on whether or not the prices of individual commodities are proportional to their values.

*Section 2* ('The Two Departments of Social Production') presents in detail the basic framework of his reproduction tables and the division of society's total product into two departments (means of production and means of consumption). The key magnitudes in the reproduction tables are the component parts of the capital invested and recovered in the two departments (constant capital, variable capital and surplus value). It is clearly stated that these components of capital are defined in terms of money: 'The figures may be in millions of marks, francs, or pounds sterling' (C.II., 473). The main question analyzed by Marx in these reproduction tables, as in the previous discussions, is how the different components of money capital invested are eventually recovered as a result of the various transactions between and within these two departments, so that capitalist production can continue in the next year on the same scale. Once again the precise quantities of physical inputs and outputs play no essential role in this analysis of the reproduction of the various components of money capital.

*Section 3* ('Exchange Between the Two Departments') analyzes the key acts of exchange between the two departments: (1) the sale of means of consumption by capitalists in department II to workers and capitalists in department I (an exchange between capital and revenue) and (2) the sale of means of production by capitalists in department I to capitalists in department II (an exchange between capital and capital). By means of these exchanges (1) the money advanced as constant capital in department II is recovered, thus enabling capitalists in department II to repurchase means of production; and (2) the money advanced as variable capital in department I is recovered, thus enabling capitalists in department I to repurchase labor power. Marx also emphasized again the 'reflux of money', that is the general result that the money which capitalists cast into circulation, either through the investment of capital or the expenditure of surplus value as revenue, eventually flows back to the respective capitalists, through the sale of their products: 'The general conclusion that follows, as far as concerns the money that the industrial capitalists cast into circulation to mediate their own commodity circulation, is that ... the same amount of value flows back to the respective capitalists as they themselves advanced for the monetary circulation' (C.II., 477).

*Section 4* ('Exchange Within Department II') begins with the following statement pertaining to Smith's dogma:

Of the value of the commodity product in department II, we still have to investigate the components  $v + s$ . This does not bear on *the most important question we are dealing with here: the extent to which the breakdown of the value of each individual capitalist commodity product into  $c + v + s$  holds also for the value of the total annual product, even if mediated by a different form of appearance.* That question is resolved by the exchange of  $I(v + s)$  against  $II(c)$ , on the one hand, and by the reproduction of  $I(c)$  in the annual commodity product of department I on the other, something that will be left for later investigation. (C.II., 478; emphasis added)

The 'most important question' to which Marx referred in this passage – whether the total price of the total social product is resolved into  $c + v + s$  or only into  $v + s$  – is of course the key issue with respect to Smith's dogma. Although this section does not address this key question (because it is not concerned with the constant capital component of the price of commodities), it does explain how the *money* advanced as variable capital by capitalists in department II returns to the respective capitalists in department II by the sale of means of consumption to workers in department II.

*Section 5* ('The Mediation of the Exchanges by Monetary Circulation') emphasizes that all the money used to purchase both the two main components of the total social product – the means of production and the means of consumption – comes from money that capitalists themselves have thrown into circulation. This fact that all money in circulation originally comes from capitalists is true even in the sense that the money which realizes the surplus value of the capitalists in department I was cast into circulation by these same capitalists in department I (by means of the purchase of means of consumption from the capitalists in department II).

*Section 6* ('Constant Capital in Department I') presents the final piece to Marx's explanation of how the various components of capital in the two departments are recovered. The constant capital advanced in department I is recovered by means of the sale of means of production to other capitalists in department I. This purchase of means of production by capitalists in department I enables them to replace in kind the means of production consumed in this year's production and to continue production on the same scale.

Section 7 ('Variable Capital and Surplus-Value in the Two Departments') explains one reason why Smith was misled into thinking that the total price of the total social product is entirely resolved into revenue. Section 3 explained how the exchanges between the two departments – the sale of means of consumption by capitalists in department II to workers and capitalists in department I and the sale of means of production by capitalists in department I to capitalists in department II – lead to the result that the constant capital in department II is equal to the variable capital plus surplus value in department I (that is, equal to the revenue of department I). In this sense, the price of the means of consumption really is 'entirely resolved into revenue'.

However, Marx showed by means of his reproduction tables and his distinction between department I and department II that this result applies only to department II, that is, it applies only to the price of the means of consumption. It does not apply to the price of the means of production and therefore not to the price of the total commodity product. Smith argued that the price of the means of production could also be resolved into revenue in similar fashion to the price of the means of consumption, but he was wrong. All the revenue of society is spent to purchase the means of consumption produced in department II. If the total price of commodities consisted entirely of revenue, there would be no money left over to purchase the means of production and capitalists in both departments would not be able to repurchase consumed means of production.

Marx argued further that even this resolution of the price of the means of consumption into revenue does not apply in the sense that the total value produced in department II was *produced* by this year's labor in department II. Instead, part of the price of the means of consumption is due to the value produced by the labor of previous years in department I, which existed previously in the price of the means of production. And the price of the means of consumption is equal to the total revenue of society only because this total revenue includes the revenue of department I and thus includes the value produced by this year's labor in department I.

Section 8 ('Constant Capital in Both Departments') makes a similar argument related to this latter point in Section 7: that the confusion surrounding the reproduction of constant capital stems from the fact that the current labor in both departments produces

new value, which is equal to the price of the means of consumption and which provides revenue in both departments with which the means of consumption are purchased. This fact makes it appear as if there is no labor left over to reproduce the means of production, or that the means of production somehow reappear without any labor having been expended by society to produce them. However Marx explained this contradictory appearance by the existence of the value of the consumed means of production prior to the current year and by the distinction between abstract and concrete labor. The labor of the current year both produces new value, by virtue of its character of abstract labor, and enables the old value of the means of production to be transferred to the final product, by virtue of its character of concrete labor, which uses means of production to produce a final product.

Section 9 ('A Look Back at Adam Smith, Storch, and Ramsay') is a brief, early version of what was later expanded and became Chapter 19, which has already been discussed above (this section and most of the rest of Chapter 20 was written in 1870 and Chapter 19 was written in 1878). This section begins with the following clear succinct statement of Smith's dogma:

Adam Smith put forward this fanciful dogma, which is still believed to this day, in the form already discussed, according to which the entire value of the social product resolves itself into revenue ... Right to the present, this remains one of the most well-loved platitudes, or rather eternal truths, of the so-called science of political economy. (C.II., 510)

Section 10 ('Capital and Revenue: Variable Capital and Wages') argues against the view, related to Smith's dogma, that the variable capital which functions as capital in the hands of capitalists becomes revenue in the hands of workers after the purchase of labor power. Marx argued instead that the purchase of labor power converts the variable capital of the capitalists from the form of money to the form of labor power. But since the variable capital remains in the hands of capitalists, although in a different form, it cannot become revenue for workers. Instead, from the point of view of workers, what is converted into revenue by the sale of their labor power is the value of this labor power, not the variable capital of the capitalists.<sup>9</sup>

Section 11 ('Replacement of Fixed Capital') will be discussed below in connection with Chapter 21, because of the similarity of the themes dealt with.

Section 12 ('Reproduction of the Money Material') assumes that money is gold and analyzes gold production as a section of department I. The main point of the section is a critique of the views of Smith and Tooke regarding the quantity of money needed for circulation, which are related to Smith's dogma. Marx summarized this critique as follows:

We saw that for Adam Smith the entire value of the social product resolved itself into revenue, into  $v + s$  and that the value of the constant capital was taken as zero. It necessarily follows from this that the money required for the circulation of the annual revenue would also be sufficient for the circulation of the entire annual product ... This was in fact Smith's opinion and was repeated by Thomas Tooke. This false conception of the ratio between the quantity of money needed to realize revenue and the quantity of money that circulates the total social product is a necessary result of the uncomprehending, thoughtless manner in which they view the reproduction and annual replacement of the different material and value elements of the total annual product. It is therefore already refuted. (C.II., 551)

Finally Section 13 ('Destutt de Tracey's Theory of Reproduction') serves Marx as an example of 'the confused and at the same time boastful incomprehension shown by political economists in dealing with social reproduction (C.II., 556). The main issue discussed is de Tracey's attempt to explain surplus value by capitalists selling their commodities – to other capitalists, to workers and to landlords – at a price that exceeds their value.<sup>10</sup> Marx showed in each of these three cases the logical contradictions that result from this explanation of surplus value.

**Section 11 of Chapter 20 ('Replacement of the Fixed Capital') and Chapter 21 ('Accumulation and Reproduction on an Expanded Scale')**

Section 11 of Chapter 20 and Chapter 21 were written late (1878) in one of the last Volume Two manuscripts (VIII) and introduce an important new theme into Marx's analysis of reproduction, which

Marx seems to have discovered while working on his reproduction tables: the effects of the discontinuity of investment in fixed capital on the reproduction of capital.<sup>11</sup> In the case of simple reproduction (Section 11 of Chapter 20), this discontinuity of investment results from the fact that buildings and machinery and other forms of fixed capital are not replaced every year, but only after a number of years. This discontinuous reinvestment means that part of the constant capital recovered by some capitalists is not immediately used to replace buildings, machinery and so on, but instead remains in the form of a *money hoard*. This formation of money hoards seems to imply that in a given year some capitalists in department I will not be able to sell all their output. This apparent difficulty is at least partially overcome by the fact that, in any given year, other capitalists possess an additional sum of money capital which has been accumulated in previous years from annual depreciation charges and which eventually enables these capitalists to repurchase their machinery and so on when it is worn out. This additional sum of money capital provides an additional source of demand for the machinery and so on produced in department I.

However, in order for the demand for machinery and so on to be equal to their supply, and thus for simple reproduction to continue smoothly, Marx emphasized that the following two conditions must hold: (1) the price of the machinery and so on which has to be replaced by some capitalists must be equal to the annual depreciation charges of the remaining capitalists and (2) these amounts must remain constant from year to year. Marx argued that, because of the anarchic nature of capitalist production, it is extremely unlikely that such a balance could be achieved and maintained. Thus he concluded:

This example of fixed capital – in the context of reproduction on a constant scale – is a striking one. A disproportionate production of fixed and circulating capital is a factor much favored by the economists in their explanation of crises. *It is something new to them that a disproportion of this kind can and must arise from the mere maintenance of the fixed capital.* (C.II., 545; emphasis added)

Similarly the main purpose of Chapter 21 is to explore further this theme of the possibility of disruptions in the reproduction of capital in the context of expanded reproduction.<sup>12</sup> As in the previous discussion, the main source of disruptions is the discontinuity

of investment in fixed capital – the fact that a certain minimum amount of money capital is required before additional buildings, machinery and so on can be purchased, so that potential money capital must be hoarded over multiple production periods. The difference in the case of expanded reproduction (compared to simple reproduction) is that the money capital that is hoarded in order later to purchase machines is part of the surplus value component of the price of commodities, rather than the constant capital component.

The fact that some surplus value must be hoarded in anticipation of future investment in fixed capital means that, unless there is some offsetting source of demand, there would be a shortfall of demand to purchase all the commodities produced. However, once again, there usually is an offsetting source of demand: other capitalists who have hoarded surplus value in previous periods and who now 'dishoard' their potential money capital and use it to purchase additional machines and so on. Thus the necessary condition for continued smooth expanded reproduction is that the amount of potential money capital hoarded by some capitalists must be equal to the amount of money capital dishoarded by other capitalists to purchase additional machines and so on. Marx emphasized again that it is extremely unlikely that such a balance will be achieved because of the anarchy of capitalism. Thus the condition for smooth expanded reproduction becomes a condition for the disruption of reproduction. The necessity to hoard surplus value as potential money capital is another inherent source of instability in capitalist economies.

Marx also commented several times in this chapter (C.II., 569, 574, 594) that the credit system evolved as a means to concentrate the multiple hoards of potential money capital and to make these hoards available to other capitalists for use as active money capital to purchase means of production and labor power, thus enabling capitalism, to overcome, at least in part, the disruptions stemming from the necessity to hoard potential money capital. However Marx also commented that the credit system increases the 'artificial character of reproduction' and thus also increases the chances that 'its normal course will be disrupted' (C.II., 376).

In Section 3 of this chapter, Marx identified another possible source of disruption of reproduction – varying rates of accumulation.<sup>13</sup> For example, an increase in the rate of accumulation means that a smaller proportion of surplus value is used to purchase means of consumption and a greater portion is used to purchase means of

production. This change in the proportions of surplus value that are accumulated and consumed means that, if reproduction is to continue smoothly, means of production and means of consumption must be produced in greater and smaller proportions, respectively. Again the anarchy of capitalism makes it unlikely that such a change in the proportions between means of production and means of consumption will occur smoothly and without disruption.

Thus it is clear that, in Marx's analysis of expanded reproduction, as in his analysis of simple reproduction, the tables of reproduction are defined in terms of quantities of money, not in terms of physical quantities of inputs and outputs. The questions dealt with in the analysis of expanded reproduction are all concerned with *money capital* and the effects of this characteristic feature of capitalism, especially on the tendency of capitalism toward periodic crises. Marx's analysis and conclusions in this chapter – the effects of the need to hoard potential money capital and of varying rates of accumulation on the continuity of reproduction, and the development of the credit system to activate hoards of potential money capital – do not depend in any way on the specification of the physical quantities of inputs and outputs (that is on input – output coefficients). These physical quantities were never specified or assumed by Marx because they are not necessary for the questions being analyzed. Instead the focus throughout is on quantities of money capital.

The fact that the production of commodities is the general form of capitalist production already implies that *money* plays a role, not just as means of circulation, but also as *money capital* within the circulation sphere, and *gives rise to certain conditions for normal exchange that are peculiar to this mode of production, whether simple or expanded reproduction, which turn into an equal number of conditions for an abnormal course, possibilities of crisis, since, on the basis of the spontaneous pattern of this production, this balance is itself an accident.* (C.II., 570–71; emphasis added)

## CONCLUSION

This paper has argued that the quantities in Marx's reproduction tables in Part 3 of Volume Two of *Capital* and related drafts are not defined in terms of physical quantities of inputs and outputs and

do not depend in any way on the specification of these physical quantities. Instead the reproduction tables consist of quantities of money which circulate as capital and as revenue, and have to do primarily with the reproduction of the various components of the money capital invested in the two departments. The main purpose of Marx's reproduction tables was to refute Smith's dogma, the erroneous view that the total price of the total social product is entirely resolved into revenue. Smith's dogma and Marx's refutation of it do not depend in any way on the physical quantities of inputs and outputs. Instead Smith's dogma has to do with the components into which the total price of the total social product can be resolved. Since the total price is defined in units of money, the components of this total price are also defined in units of money. Marx's refutation of Smith's dogma has to do with the distinction between money which functions as capital and money which functions as revenue. Since capital is defined in terms of money, the components of capital (constant capital, variable capital) and surplus value are also defined in terms of money.

Therefore one of the main supports of the neo-Ricardian interpretation of Marx's theory has been shown to be erroneous. Marx's reproduction tables of money capital are not physical input – output matrices. These reproduction tables provide no evidence for the neo-Ricardian interpretation that Marx began his theory with given physical quantities of inputs and outputs and derived values and prices from these given physical quantities. Instead these reproduction tables support the alternative interpretation, which has been presented elsewhere (Moseley, 1993), that the basic framework for Marx's theory is the *circulation of capital* and that the circulation of capital is defined in terms of quantities of *money* which are invested and recovered through the production and sale of commodities. The quantities of money which initiate the circulation of capital through the purchase of means of production and labor power are the fundamental givens (the starting-point) in Marx's theory, not the physical quantities of inputs and outputs. The full implications of this alternative interpretation are far-reaching. We have discussed elsewhere (Moseley, 1993, 1997) the implications of this alternative interpretation for Marx's theory of equal rates of profit and prices of production (that is, for the 'transformation problem').

The burden of proof would thus appear to be on the neo-Ricardians to provide other arguments and other evidence that

Marx's theory is based on physical input – output tables, that is to say that it is essentially the same as Sraffa's theory. Marx's reproduction tables provide evidence to the contrary.

### Notes

1. I have argued in Moseley (1993) that the related neo-Ricardian interpretation of Marx's theory of value and price, mentioned in the previous paragraph, is likewise fundamentally mistaken.
2. Other authors who have briefly discussed the relation between Marx's reproduction tables and Smith's dogma include Heinrich (1989 p. 69) and Clarke (1994 p. 269). These discussions alerted me to this connection and prompted my further study of Marx's reproduction tables from this perspective. Elsewhere (Moseley, 1995) I have criticized Heinrich's interpretation of other aspects of Marx's theory, but he is right that Marx's work on the reproduction tables was motivated by his desire to critique Smith's dogma.
3. Foley (1986, ch. 5) has also emphasized that Marx's reproduction schemes consist of quantities of money capital. However Foley argues that the main purposes of Marx's analysis of reproduction was to determine the necessary proportions between the money capital in the two departments for stable reproduction and to investigate the problem of aggregate demand. These themes are dealt with in Marx's analysis of reproduction, but they are not the most important subjects.
4. The references to Marx in this paper utilize the following shorthand notation:
 

C.I.	<i>Capital</i> , Volume 1.
C.II.	<i>Capital</i> , Volume 2.
C.III.	<i>Capital</i> , Volume 3.
G	<i>Grundrisse</i>
MECW.31.	<i>Marx-Engels, Collected Works</i> , Volume 31.
SC.	<i>Selected Correspondence</i> .
TSV.I.	<i>Theories of Surplus-value</i> , Volume 1.
5. This principle of historical specificity has been emphasized by Rubin (1972, ch. 4), Korsch (1938, Ch. 2), and Rosdolsky (1968, pp. 77–80).
6. It should be noted that these categories are the reverse of the two departments in Marx's later versions of the reproduction tables.
7. Clarke (1994 p. 269) argues: 'This adaption of Quesnay's scheme developed out of Marx's critique of Adam Smith's neglect of constant capital in reducing the national product to the revenues of wages, rent and profit, ignoring that component which serves to replace the means of production used up during the year, and was the basis of the discussion of reproduction in Part Three of Volume Two of *Capital*.'
8. It should be noted that Marx did not use his reproduction tables to analyze the determination of prices of production in Part Two of

Volume Three, as in the neo-Ricardian interpretation, beginning with Bortkiewicz, to whose work Sweezy (1968) drew attention.

9. This point is also discussed in Chapter 19, pp. 454–8.
10. Marx commented: 'Here you have bourgeois cretinism in its ultimate state of bliss' (p. 584).
11. Marx called this a 'major problem' and commented that 'this problem ... has not been dealt with at all by the political economists up to now' (C.II., 530). See Clarke (1994, pp. 268–73) for a very good discussion of Marx's analysis of the problems posed by the discontinuity of investment in fixed capital for the smooth reproduction of capital.
12. The debate in the early twentieth century over Marx's reproduction schemes between Tugan-Baranowski, Hilferding, Luxemburg, Lenin and so on was almost entirely concerned with expanded reproduction. Simple reproduction, the bulk of Marx's writing on the subject of reproduction, was hardly ever mentioned. None of the participants in the debate mentioned Smith's dogma. Nor did they discuss the discontinuity of investment in fixed capital as a source of disruptions of reproduction. The main issue in this debate was whether there would be sufficient demand to realize the surplus value produced in the case of expanded reproduction. Therefore the participants in this debate used Marx's reproduction tables for purposes quite different from Marx's own purposes. However they did at least interpret Marx's reproduction tables in terms of quantities of money capital, not in terms of physical quantities of inputs and outputs.
13. Marx discussed this point primarily in terms of the transition from simple reproduction to expanded reproduction, but the point applies more generally to any change in the proportions of surplus value that are accumulated and consumed.

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