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**THE CAPITALIST STATE
AND ITS ECONOMY;
DEMOCRACY IN
SOCIALISM**

EDITED BY

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ABSTRACT

This paper seeks to reconcile two very different views existing in the literature concerning how exchange and demand affect the magnitude of commodity values. Traditionally, value is considered to be created in production and subsequently realized in exchange. An alternative monetary approach posits that exchange itself contributes to the determination of commodity values. Proponents of each view claim that significant parts of Marx's theory of value are compromised if their interpretation of the role of exchange is not adopted. Drawing on the work of Rosdolsky and Roberts, I argue that it is necessary to distinguish between the effects of exchange and demand. Exchange acts to reduce concrete, private labor to abstract social labor, while demand affects the magnitude of labor considered "socially necessary" in the sense of being expended in accordance with existing social need. I identify a new category of exchange value – the market-price of production – and use it to explain how changes in demand act to redistribute value across industries by

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affecting the magnitude of abstract labor considered to be socially necessary. In this way the major claim of the two approaches to exchange are reconciled. The magnitude of value is fully determined in production. At the same time monetary exchange effects, or brings about, a social division of labor by reducing concrete, private labor to abstract social labor and by distributing value according to social need as expressed by effective demand.

1. PRODUCTION OR EXCHANGE?

A commodity is produced with labor of average skill and intensity but fails to sell. Has value been created? The answer to this question delineates two schools of thought within the value theory literature, places at odds two important elements of Marx's economic theory and reveals important assumptions concerning what is meant by the concept of value.

Traditionally, the answer is yes: value is created in production but fails to be realized in exchange. Insufficient demand for a commodity affects the commodity's value only indirectly, through changes in market prices, industry rates of profit and subsequent changes in the conditions of production which affect the labor expended in production. Allowing for a direct affect of demand on a commodity's value implies that market conditions can augment or detract from a commodity's value. This position undermines the idea that all value comes from the expenditure of labor in production and invalidates the claim that all surplus labor results from the exploitation of workers in production. Marx's theory of exploitation, according to this traditional view, requires that demand cannot directly affect the magnitude of commodity values.

An equally compelling case can be made for the opposite claim that market conditions must directly affect the magnitude of commodity values. In this monetary approach, only the exchange against money can validate a private expenditure of labor-time as part of the social division of labor in a capitalist society. In capitalism, independent private producers expend concrete, particular labor in production but only through exchange is this expenditure of labor measured against the private labors of other producers and articulated into a social division of labor. It is through exchange that the social relations between producers are validated as part of the total social labor. In this way the exchange of commodities is fetishized: the social relationship among producers takes on the appearance of a relationship among the commodities themselves mediated by money. The magnitude of value, in this monetary view, is only measured by and determined through the quantity of money a commodity receives in exchange. Marx's theory of commodity fetishism thus requires that demand directly affects the determination of commodity values.

Marx's theory of value and price is thus stuck on the horns of a dilemma. Choosing one or the other answer to the question of how demand affects value places in jeopardy one of these two important aspects of Marx's theory of value. Furthermore, the answers to this question imply very different assumptions concerning what is meant by value. Clearly a resolution of this disagreement is necessary for the further development of Marx's theory of value.

In this paper, I will argue that it is possible to reconcile the main claims of these two opposing views. It is possible, in other words, to allow a direct role for demand in the determination of value without undermining the idea that all value is created in production. In order to effect this reconciliation, it is necessary to integrate two developments within Marxian value theory and in so doing to distinguish two effects within the exchange process that are commonly conflated. The first concerns the effect of exchange *per se* on the determination of value and exchange-value. This question is independent of the question of the role of variations in demand. It deals specifically with the relationship between a commodity's value and exchange-value and the question of how exchange effects a reduction of private concrete labor to social abstract labor. Here, the recent work by Roberts (1997, 2004, 2005), building on the insights of Wolff, Callari and Roberts (1984), can be used to explain how exchange effects a reduction of concrete to abstract labor and distinguishes a commodity's value from its exchange-value without contributing an independent source of value.

The second is Rosdolsky's interpretation of the effect of demand on the determination of market-value in Chapter 10 of Volume 3 of *Capital*. Rosdolsky (1977) argues that demand plays a direct role in the determination of market-value by affecting the quantity of labor expended that is considered socially necessary in the sense of being expended in proportion to the existing social need for the commodity. With the integration of demand, it is necessary to consider the range of techniques within an industry in order to determine a commodity's market-value. The limitation of Rosdolsky's analysis is that it takes into account competition only within a single industry. An increase in demand thus appears to imply an increase in the magnitude of value produced. By generalizing Rosdolsky's interpretation of the determination of market-value to the case of competition among industries it can be demonstrated that demand acts to redistribute value among industries; it does not represent an independent source of value.

By integrating Rosdolsky's and Roberts' contributions a new category of exchange-value emerges – the market-price of production. I will argue that this new concept permits the analysis of how changes in demand in the short run redistribute value. The value and exchange-value of a given commodity are directly affected by the magnitude of demand; however, demand does not act as an independent source of value. The theory of exploitation and the theory of commodity fetishism

can be retained and the difference between the two approaches to value and price can be reconciled.

In Section 2 below, I will first examine Roberts' arguments concerning how exchange affects the magnitude of abstract labor and then Rosdolsky's interpretation of how demand directly affects value by affecting the quantity of labor-time considered socially necessary. In Section 3, I will integrate these two developments and explain the determination of the market-price of production and how this concept can be used to theorize the redistribution of value due to shifts in demand between industries. I will conclude, in Section 4, with some observation on the merits of the present analysis and directions for future research.

Since the intent of the paper is to reconcile the competing interpretations of the meaning of value in order to provide a theoretical basis for Marxian price theory, I will present only limited numeric examples meant to clarify the concept of the market-price of production. An algebraic model demonstrating the relationship between value and exchange-value is presented in the appendix. A more complete explication of this model can be found in Kristjanson-Gural (2003).

2. EXCHANGE, DEMAND AND VALUE

2.1. Exchange and Abstract Labor

If labor only becomes abstract labor through the process of exchange as the monetary approach insists, how can it be said that the magnitude of value is determined solely by the expenditure of labor in production? This quandary first appears in the English language literature in the writing of I. I. Rubin (1973). Rubin distinguishes two aspects to the concept of abstract labor and struggles to provide an account of how exchange effects a reduction from concrete private labor to abstract social labor. Subsequent theorists attempt various methods of resolving the quandary each of which encounters difficulties integrating the two aspects of abstract labor Rubin identifies. The recent work of Roberts, however, resolves these difficulties and demonstrates how exchange effects a reduction from concrete to abstract labor without implying exchange is a source of value.

The first aspect of abstract labor identified by Rubin is familiar. Abstract labor is homogenous labor – labor considered apart from its particular characteristics as a specific type of labor – spinning, weaving; shoe-making. “This generally accepted definition can be reduced to the following, very simple statement: concrete labor is the expenditure of human energy in a determined form (cloth-making, weaving, etc.). Abstract labor is the expenditure of human energy as such,

independently of the given forms. Defined this way, the concept of abstract labor is a *physiological* concept, devoid of all social and historical elements” (Rubin, 1973, p. 132).

Rubin identifies a second meaning of the term “abstract labor” which serves to preserve the social and historical specificity of the concept of abstract labor and to avoid the problems which result from interpreting abstract labor in a physiological manner. He argues that labor only becomes abstract labor in the process of equalizing qualitatively different concrete labors in the context of commodity exchange. Abstract labor in this sense is social labor – an aliquot part of the total labor expended in the economy. Only in commodity exchange is a social division of labor effected through the exchange of commodities on the market. It is through this process of equalization that private independent labor is articulated into a social division of labor. Abstract labor is therefore not simply undifferentiated labor; it is a specific type of social labor which has been equalized through the process of commodity exchange.

Rubin emphasizes the socially contingent nature of abstract labor with a quote from Marx in which he compares the characteristics of labor in commodity production to communal labor:

The very nature of production under a communal system makes it impossible for the labor of the individual to be private labor and his product to be a private product; on the contrary, it makes individual labor appear as the direct function of a member of a social organism. On the contrary, labor which is expressed in exchange-value, at once appears as the labor of a separate individual. *It becomes social labor only by taking on the form of its direct opposite, the form of abstract universal labor.*

(Cited in Rubin, 1973, p. 143)

According to this view, abstract labor does not exist independently of the process of the equalization of labor which occurs in commodity exchange. The specific way in which this equalization occurs in capitalism is through the exchange of commodities against money. It is monetary exchange which effects the equalization of labor and reduces individual concrete types and quantities of labor to homogeneous abstract labor.

Subsequent theorists, who came to be known as the Rubin School, reinforced Rubin's claim that exchange is central to the determination of value. They argued further that because value only appeared in the act of exchange it could only be measured in money units. Two main advantages of Rubin's approach were highlighted. First, by identifying the second aspect of abstract labor, Marx's distinctions between private verses social labor and concrete verses abstract labor no longer appear empty of content. “Lacking any conscious assignment or distribution on the part of society, individual labor is not *immediately* an articulation of social labor; it acquires its character as a part or *aliquot* of aggregate labor

only through the *mediation* of exchange relations or the market" (Colletti, 1973, p. 462, emphasis in original). Indeed, there appears to be no other way to effect the reduction.

[I]t is precisely the social nature of abstract labor that makes it invisible in the process of production, which in the capitalist mode of production takes the form of an individual activity, for the process of commodity production is not *directly* social . . . [As a result] there is no way to reduce observable concrete labor to social abstract labor in advance, outside of the market which actually effects the reduction.

(Gerstein, 1976, p. 52)

Second, Rubin's analysis helped to integrate Marx's theory of money with his theory of value and prices. Money is recognized as the form of appearance of value and integrating the theory of money with the theory of prices becomes vital to the understanding of Marx's analysis. By assuming abstract labor to be homogeneous labor prior to exchange, the important role money plays in the theory of value is overlooked.

The following problem, identified by Rubin, remained unresolved. If exchange effects the reduction of concrete to abstract labor, then the magnitude of value is determined not by the expenditure of labor in production, but only through exchange. Changes in the exchange ratios appear to imply changes in the quantity of value each commodity represents, changes which are independent of the expenditure of labor in production. Rubin argued against this conclusion claiming that while labor expended in production can not be considered fully abstract prior to exchange . . . "This does not prevent us from ascertaining a series of quantitative properties which distinguish labor in terms of its material-technical and its physiological aspects and which causally influence the quantitative determination of abstract labor before the act of exchange and independent of it" (1973, p. 155). Rubin was not able, however, to provide a method for determining the magnitude of abstract labor prior to exchange.

The Rubin school theorists, however, abandoned the attempt to provide a quantitative measure of value. They argued that since "abstract labor can be *observed* in only one place – the market – . . . [where it] takes the form of money . . . , abstract labor as such can be *measured* only when it takes the independent form of money, a form that poses it against the 'bodily form of the commodity in which it is embodied'" (Gerstein, 1986, p. 53; see also DeVroey, 1981, p. 189). On this basis Rubin School theorists concluded that Marx's theory of value cannot provide the basis for a quantitative theory of price determination. Because the market itself determines the magnitude of abstract labor and because the actual relations of exchange are subject to contingencies which lie outside the purview of theory, ". . . in principle, Marx's theory of value cannot be used to obtain prices" (Gerstein, 1976, p. 53). Furthermore, the determination of value with reference to

exchange ratios in the market implies that value cannot be the only determinant of prices (DeVroey, 1981, p. 193).

A similar conclusion is reached via a different route by a group known as the value-form theorists. Eldred and Hanlon (1981) defend the necessity of expressing value in money units on the basis of the dialectical development of the form of value in *Capital*. According to this interpretation, the contradiction between the use-value and the exchange-value of the commodity-form of value results in the development of the money-form as the expression of the essence of value. Two conclusions follow from their analysis. First, the value of a commodity can only be expressed in units of money. "Just as the value of a commodity is only expressed in exchange relation, so can the magnitude of value only be expressed in these relations" (Eldred & Hanlon, 1981, p. 35). Second, value can not be considered to exist prior to the exchange of commodities. "[T]he labor content of commodities deserves the name of value of a certain magnitude only insofar as it proves itself to be such through being sold. Only then (that is, *post facto*) can we properly speak of the labor performed in the immediate process of production as value-creating labor" (Eldred & Hanlon, 1981, p. 26).

Thus, both the Rubin School and value-form theorists argue that value is only determined through exchange and that the magnitude of value can only be expressed in money. In so doing, however, they encounter difficulties maintaining a quantitative determination of value and prices. They cannot in other words, resolve Rubin's problem of "ascertaining a series of quantitative properties which distinguish labor in terms of its material-technical and its physiological aspects and which causally influence the quantitative determination of abstract labor before the act of exchange and independent of it" (1973, p. 155). Theorists working within a monetary approach to exchange have continued to grapple with the problem. Bellofiore (1989) argues that the monetary approach implies that Marx's theory is suitable only for analysis of value flows at the macro level and is not suitable for micro analysis of price determination. Mohun (1994) argues, however, that it is possible to construct a theory of price determination by utilizing the concept of the monetary expression of labor-time to translate between values and exchange-values.¹ It is helpful to take a closer look at Mohun's argument.

In Mohun's view the key to the development of a consistent theory of price determination lies in properly understanding the relation between value and exchange-value. Mohun defines value as socially necessary labor-time – the average labor required to produce a commodity taking into account different levels of work intensity, skill and productivity (p. 395). This labor value differs from the commodity's exchange-value (or value-form) which is the quantity of abstract labor the commodity exchanges for expressed in units of money. Because money represents abstract labor and can be converted into a definite quantity of abstract

labor-time using the monetary expression of labor-time, the value of the commodity can be compared with the exchange-value to see how the process of exchange acts to redistribute existing value among industries. The difference between the abstract labor determined by exchange and the socially necessary labor expended in production represents a redistribution of labor-time as the result of the process of exchange (p. 403).

Mohun goes on to argue that any number of exchange regimes is possible but that Marx explicitly interested two particular regimes – exchange at values and exchange at prices of production. In the case of exchange at values, no redistribution of value occurs since the abstract labor represented by the commodity in production is equal to the amount assigned to it in exchange. In the case of exchange at prices of production, however, there is redistribution according to the compositions of capital across industries. Mohun refers to this as a case of unequal exchange since the commodity exchanges at an exchange-value above or below its value. Exchange at market prices represents a third important possibility according to Mohun. Here value is redistributed according to the level of demand and supply existing in each industry. “This distribution is a distribution of labor-time across the individual commodities aggregated as net product and is effected by prices. This is the fundamental meaning of ‘price’; ‘price’ is a representation of a proportion of society’s total labor-time allocated to a particular commodity. In this sense prices are forms of value, of abstract labor (1994, p. 403).”

Mohun’s approach has the merit of providing a quantitative determination of prices and values from the perspective of the Rubin School. It distinguishes value from exchange-value (or value-form), provides a role for exchange in the determination of the value-form and recognizes the importance of the different assumptions Marx introduces concerning exchange. However, as I will argue in the next section, Mohun’s interpretation conflates the effect of exchange and the effect of demand and attributes them both to the determination of abstract labor. Value, according to Mohun, is a magnitude of socially necessary labor-time determined by the conditions of production of a commodity prior to and independent of exchange (1994, p. 394). It is “measured in terms of socially necessary time (standardizing for different work intensities, productivity levels, skills and so forth)” (1994, p. 395). The process of exchange, therefore, is not implicated in the determination of value: value is determined entirely in the process of production according to the labor required on average to produce the commodity. Value is therefore constituted by concrete private labor and not abstract labor as Rubin argues. Exchange then determines only the exchange-value of the commodity; not its value. Furthermore, by defining value according to average labor expended in production, Mohun overlooks a second, or macro, aspect of socially necessary labor Marx introduces – production in accordance with existing social need. It is this second meaning that

is related to the role of demand in the determination of value and exchange-value as I will argue below.

Roberts (2004) produces an interpretation of the role of exchange in the determination of abstract labor that successfully resolves the difficulties identified by Rubin.² He uses the distinction between the commodity’s value and its value-form or exchange-value to argue that exchange serves to redistribute value created by labor in production according to the prevailing rule governing exchange. Three interrelated elements of Roberts’ approach together serve to resolve the quandary of how exchange can affect the determination of value without itself representing a source of value: the relationship between value and exchange-value, the measurement of both value and exchange-value in both labor and money units and the use of a net product normalization to maintain the aggregate equality between values and exchange-value and to translate between magnitudes of labor and money. Each of these will be considered in turn.

The value of a commodity is determined by the new labor expended in production and the value transferred to the commodity by the constant capital. According to Roberts, it is the exchange-value that is relevant for determining the amount of value transferred to the commodity via the means of production since the latter are not produced in the production process but are acquired through exchange (Wolff et al., 1984). When commodities exchange at their values, this distinction is unimportant; once commodities exchange at prices of production rather than continuing to use the embodied labor of the means of production however, the abstract labor misrepresents the way in which production and exchange are articulated in capitalism.

Roberts argues that the exchange-value of the commodity, its price of production, is the amount of abstract labor the commodity represents in *equivalent* exchange given the assumption that competition tends to equalize rates of profit across industries. It is no longer viable to assume exchange according to values once inter-industry competition is introduced into the analysis. Since producers must obtain the means of production at their exchange-values, it is necessary to measure the abstract labor contributed by the means of production at their exchange-values rather than their values. The value of the commodity is thus the new labor expended in production plus the abstract labor transferred to the commodity by the means of production.

For example, suppose a commodity requires two hours to produce, one hour of new labor and one hour represented by material and equipment used up in production. Suppose this composition of capital is higher than average so that equivalent exchange – the exchange ratio that equalizes the rate of profit in the industry with the general rate of profit – implies that the commodity exchange for the equivalent of three hours of value. If this commodity is used as constant capital

in the period in question, it transfers three hours of value since that is the amount of value necessary to part with in exchange for this element of constant capital.³ The difference between the value and the exchange-value, here one hour, represents a redistribution of value due to the higher organic composition of capital (relative capital intensity) of the industry. This value is not created by exchange: it comes from industries with low compositions of capital in which the exchange-value is less than the value.

This insight has the benefit of resolving the problems associated with the traditional approach to transforming values into prices. Further it answers the question of how abstract labor can be quantitatively determined prior to exchange – a question that Rubin struggled unsuccessfully to answer. Value and exchange-value are both constituted as quantities of abstract labor; the difference between them represents a redistribution of value according to the respective compositions of capital that results from the equalization of rates of profit.

This explanation has the further merit of integrating a role for money in the determination of value and exchange-value without abandoning a quantitative determination of value and prices. Both value and exchange-value can be expressed in units of abstract labor and both can be converted into units of money using the monetary expression of labor-time – the ratio of the price of the net product to new value created in labor units. If in the preceding example the monetary expression of labor time is assumed to be \$50/hr, the value of the commodity would be \$100 and the price of production would be \$150. Each unit of the commodity used up in production would contribute \$150 or 3 hours of value to production in the period.

In Roberts' analysis, then, abstract labor is not simply homogeneous labor; it is also labor considered as an aliquot part of the total labor attributed to each commodity according to the prevailing rule of exchange equivalence. Whatever the particular quantity and type of concrete labor employed, the commodity, through exchange, becomes the bearer of a certain proportion of the total labor. The portion of the total is not determined on the basis of the labor expended in the production of the commodity itself, nor can it be. Because the labor gets distributed through the process of exchange in proportion to the total capital advanced in each industry, the quantity of abstract labor attributed to each commodity can only be made with reference to the totality.

Each commodity is not only the product of its own industry specific conditions (as such it is a value), it is also, as a bearer of exchange-value, simply the product of a specific aliquot share of the aggregate means of production and concrete labor employed. And as such . . . it represents a particular magnitude of abstract labor, the simple sum of the concrete labors it contains when viewed, not as *itself* but as a *part of the whole* . . .

(Roberts, 2004, p. 129, emphasis in original)

Each unit of abstract labor is therefore comprised of a proportion of each type of concrete labor employed in the whole economy. It is thus homogeneous, in that it is not representative of any one type of labor, and it can be considered as an aliquot part of the total social labor because it is comprised of a portion of each particular type of labor expended. Exchange is the means by which the determination of abstract labor is effected but this does not imply that exchange affects the overall magnitude of value. Since the total concrete labor expended in the period defines the magnitude of total abstract labor, exchange can never augment nor detract from value. It merely redistributes this labor to each industry on the basis of the quantity of capital advanced. The existence of inter-industry competition is thus necessary to integrate the two meanings of abstract labor identified by Rubin.

2.2. Demand and Socially Necessary Labor-Time

Roberts' explanation of how exchange affects the determination of abstract labor does not consider the effect of changes in demand on the determination of the values and exchange-values of commodities. The question of how changes in demand affect value requires the reconciliation of two aspects of socially necessary labor-time. The next question to address, therefore, is whether variations in demand affect the determination of values and exchange-values directly and if so do they represent an independent source of value?

Rubin raises this question by examining the two meanings Marx attributes to socially necessary labor-time. The first is a technical meaning having to do with the degree of skill and intensity of the labor expended in production. The labor-time socially necessary is "that required to produce an article under the normal conditions of production, and with the average degree of skill and intensity prevalent at the time" (Marx, 1954, p. 47). Labor of below average skill or intensity does not create correspondingly more value: the product of that labor has only the same value as commodities produced with average skill and intensity. I will refer to this aspect of socially necessary labor as the micro sense – the labor required on average to produce the commodity. It is used to distinguish the commodity's market-value from its individual value once the existence of different techniques of production is explicitly taken into consideration (Rubin, 1973, p. 173). The second, or macro, sense of socially necessary refers to the possibility that, although labor is expended with average skill and intensity, the total quantity of labor expended on a particular commodity does not correspond to that which is necessary to satisfy the existing social need. Insufficient demand for a commodity implies that some of the labor expended is not socially necessary in this second sense, and it follows that demand may directly affect the commodities value – the socially

necessary abstract labor time the commodity represents. This second sense of the term is referred to by Marx in several passages throughout *Capital* and is implicit in his discussion of the determination of market-value in Chapter 10 of Volume 3.

The question of whether demand directly affects the values and exchange-values of commodities therefore hinges on whether the second sense of socially necessary labor is valid. I will first present Rosdolsky's (1977) interpretation of Marx's analysis of how demand affects the determination of value in which he argues that demand *does* have a direct role in the determination of the market-value. I will then offer Rubin's (earlier) argument that this second meaning should be rejected, in part on the grounds that it implies that labor is not the sole source of value. He offers an alternative interpretation of how demand affects the determination of values and exchange-values that excludes a direct role for demand. Several contemporary writers follow Rubin and I will offer two alternative interpretations of how demand only indirectly affects value and exchange-value. I will then argue that, by limiting his analysis only to the determination of market-value, Rosdolsky is unable to show how demand can affect the determination of value directly without representing an independent source of value. It is necessary to apply Rosdolsky's arguments concerning the effect of demand on the determination of value to the case of inter-industry competition. Once this is done, the objections of Rubin and subsequent writers are overcome.

Rosdolsky's claim that demand has a direct affect on the determination of value relies on his interpretation of Marx's analysis of the effect of demand on market-value in Chapter 10 of Volume 3 of *Capital*. Because this analysis is crucial for the argument concerning how demand affects the determination of exchange-value and for the development of the category "market-price of production" in the next section, it is necessary to examine this argument in some detail.

Marx begins the analysis of the determination of market-value, by identifying three categories of producers according to the labor requirements for the production of the commodity – those whose production conditions allow the individual value of their output to be lower than the average, those whose individual value is above average and those whose individual value is equal to the average for the industry (Rosdolsky, 1977, p. 91). He then considers two supply conditions in the industry. In the first, which I shall call balanced supply, the distribution of output for the above and below average groups is equally divided. In the second, the distribution of output is skewed: one of the extreme categories provides more output than the other such that the individual value of the commodities produced by the middle group of producers is not equal to the average value (Marx, 1959, pp. 182, 183). With this starting point, Marx then considers three possibilities concerning demand.⁴

The first possibility is market clearing: demand is just sufficient to absorb the supply at the average value for the industry as a whole. The second is what I will call a normal variation in demand. Here, quantity demanded exceeds or falls short of quantity supplied when the market-value is determined by the average value for the industry. However, demand is equal to supply at a value which lies somewhere within the range determined by the least and most efficient producers. The third possibility I will call extreme or abnormal variations in demand: demand exceeds or falls short of supply at a value determined by one of the two extreme categories. The question that Marx addresses is this: how is the market-value determined in each of these three cases?

Market clearing is the demand condition that applies to the determination of prices of production in the long-run. Assuming balanced supply, the market-value equals the individual value of the average group of producers. However, in the case of a skewed supply, Marx argues market-value can never equal the individual value of either of the extreme groups of producers as long as the market clearing assumption is maintained. The market-value thus lies above or below the individual value of the middle category of producers but within the range determined by the individual value of two extremes and does not coincide with the individual value of any of the three techniques (1959, pp. 183, 184).

Marx then proceeds to analyze the possibility of a normal variation in demand (1959, p. 184). To illustrate how normal variations in demand affect the determination of market-values he takes the example of a skewed supply – specifically an industry in which the less efficient producers predominate. In this case, when demand and supply coincide, the market-value lies above the individual value of the middle group of producers and below the individual value of the less efficient producers in the industry. Here, Marx argues that when demand deviates from supply, the market-value *can* equal the individual value of one of the two extreme groups of producers. In order for the market-value to equal the individual value of the less efficient group of producers (the predominant group), the demand for the commodity at the average value need only *slightly* exceed supply. However, in order for the market-value to equal to the individual value of the most efficient producers, supply must *significantly* exceed demand.

If demand is only slightly greater than supply, the individual value of the unfavorably produced commodities regulates the market-price. . . . Should demand be weaker than supply, the favorably situated part, whatever its size, makes room for itself forcibly by paring its price down to its individual value. *The market-value cannot ever coincide with this individual value of the commodities produced under the most favorable conditions, except when supply far exceeds demand.*

(1959, pp. 184, 185)

This passage indicates that variations in demand directly affect the magnitude of the market-value itself. The market-value can not be considered a fixed magnitude given by the average conditions of production. As Rosdolsky argues, the "... determination of market-value appears [fixed] in this way ... [only] ... if we look exclusively at the mass of commodities thrown onto the market, ignoring the possibility of an imbalance between supply and demand" (Rosdolsky, 1977, p. 91). Once variations in demand are introduced, the market-value varies within the range defined by the extreme techniques of production.

According to Rosdolsky, only in the special case of market clearing is the market-value determined by the industry average. This special case is, of course, very important for the analysis of many questions concerning how changes in production conditions affect long-run conditions of reproduction. However the general case is also important: it is necessary for the analysis of distributions of value that occur in the short run when it is not warranted to assume that demand is just sufficient to absorb the supply. The market clearing assumption must therefore be dropped in order to assess the value under these more general conditions of demand and supply imbalances. Marx's analysis in Chapter 10 provides a way to analyze how the market-value is determined when the possibility of excess or insufficient demand is introduced and profit rates must be assumed to differ across industries. In this case, the market-value moves within the range determined by the conditions of production according to the strength of effective demand for the commodity in question, "provided the demand is large enough to absorb the mass of commodities at values so fixed" (Marx, 1954, p. 185).

At this point in the text Marx considers extreme deviations of demand – how market-value is determined when demand exceeds or falls short of supply when the market-value is equal to the individual value of one of the two extreme techniques. In order to ask this question, it is necessary to consider the relationship among competing industries. It can only then be asked whether the labor expended in the production of a given commodity is in proportion to the total demand for the commodity or whether relatively too much or too little of society's labor is devoted to the production of one or another commodity (Horverak, 1988, p. 281).

So long as we dealt with individual commodities only, we could assume that there was a need for a particular commodity – its quantity already implied by its price without inquiring further into the quantity required to satisfy this want. This quantity is, however, of essential importance, as soon as the product of an entire branch of production is placed on one side, and the social need for it on the other. It then becomes necessary to consider the extent, i.e. the amount of this social want.

(Marx, 1959, p. 185)

Until this point in the text, the effective demand for the commodity has been assumed to be sufficient to absorb the supply at the market-value "no matter

which of the three aforementioned cases regulates this market-value. This mass of commodities does not merely satisfy a need, but satisfies it to its full social extent" (Marx, 1959, p. 185). In other words, as long as the market-value lies within the range defined by the techniques of production, the labor expended on the commodity satisfies the full social extent of the need for it. However, with the introduction of the existence of competing industries, the question of the distribution of demand arises and the possibility of a divergence between demand and supply must be taken into account.

The existence of excess or insufficient demand creates a deviation of market-price from market-value. However, the following passage makes explicit that there are *two* distinct deviations that occur – a deviation of the market-value from the average labor requirements *and* a deviation of the market-price from the market-value.

Should [the quantity produced] be smaller or greater, however, than the demand for them, there will be deviations of the market-price from the market-value. And the first deviation is that if the supply is too small, that *market-value* is always regulated by the commodities produced under the least favorable circumstances and, if the supply is too large, always by the commodities produced under the most favorable conditions; that therefore it is *one of the extremes which determines the market-value*, in spite of the fact that in accordance with the mere proportion of the commodity masses produced under different conditions, a different result should obtain. *If the difference between demand and the available quantity of the product is more considerable, the market-price will likewise be considerably above or below the market-value.*

(1959, pp. 185, 186, emphasis added)

This passage clearly indicates that market-value is not a fixed magnitude determined solely with reference to the conditions of production independent of demand; neither does the market-value vary independently of the conditions of production according to the level of effective demand. Instead, the market-value varies with the market-price according to the strength of effective demand within the limits imposed by the conditions of production. Outside these limits there is a deviation of market-value from market-price. The conditions of production in the industry thus impose a definite limit to the range in which the market-value can move, "[f]or, according to Marx's conception, market-value can only move within the limits set by the conditions of production (and consequently the individual value) of one of the three categories of producers" (Rosdolsky, 1977, p. 92).

Once demand is entered into the analysis, the market-value is determined by the ratio of the total demand for the commodity to the number of units produced. Total demand is expressed in money units and can be converted to labor units to determine the amount of labor-time considered socially necessary. The total demand is the expression of the total labor-time deemed socially necessary by the market. The conditions of production provide a limit to the range within

which the market-value can move with the variation in demand. Outside of this range the market-price will deviate from the market-value as in the traditional interpretation.⁵

A number of theorists have followed Rosdolsky's interpretation of the two aspects of socially necessary labor-time and the effect of variations in demand on the determination of market-value. Horverak (1988) models the effect of a change in demand on market-values over a number of periods and shows the long-run adjustment that occurs. However, because he does not incorporate the effect of exchange on the determination of abstract labor, he is unable to translate the analysis of a single industry into a more general framework utilizing prices of production rather than market-values. As a result he is unable to break out of the determination of value with reference primarily to the conditions of supply. While he successfully shows the case of deficient demand, he is unable to explain the case of excess demand, since, in the context of a single industry it seems to indicate that an increase in demand causes an increase in value. Furthermore, variations in demand themselves become irrelevant since, in the absence of technical change, the most efficient technique of production becomes generalized in either the case of excess demand or insufficient demand.

Indart (1990) recognizes the importance of framing the question in terms of prices of production and but he is unable to integrate the effect of exchange on the determination of abstract labor and is therefore unable to show how changes in demand redistribute value across industries. Indart ends up ascribing the effect of demand only to cases involving rent as does Marina-Flores (2000).

Giussani (1996) also distinguishes the micro and macro senses of socially necessary and argues that shifts in demand affect the magnitude of market-value directly. He does not, however, consider the case of extreme shifts in demand and therefore does not allow for the possibility of deviations between market-value and market price. He does attempt to analyze the case of two industries over a number of periods. In the latter case, however, he reverts to the assumption of a single technique of production in each of the industries. His analysis does not show a redistribution of value between the two industries but focuses on the determination of market prices and rates of profit.⁶

Rosdolsky's interpretation succeeds in integrating the macro sense of the term "socially necessary," but it has met opposition from traditional theorists on the grounds that it implies that the market-value of the commodity can be greater than the amount of labor required for its production. It will help then to examine the arguments raised first by Rubin, and reiterated by contemporary theorists, as to why such an interpretation is flawed.

Rubin offers the following reasons for rejecting the idea that demand directly affects the determination of commodity values: the price and value are conflated,

equilibrium is confused with disequilibrium, the concept of socially necessary labor is destroyed and the connection between the micro and macro senses of socially necessary is severed (1973, p. 183). Rubin offers an alternative method for defining the market-value in the context of variations in demand. He argues that when demand does not equal supply the market-value is determined by the individual value of the *technique capable of responding to the necessary adjustment in the quantity produced* rather than the average labor requirements. Any other determination of market-value would, in Rubin's view, destroy the condition of equilibrium which is assumed to exist between branches. For Rubin, the market-value thus serves to define the value which maintains a state of equilibrium between the various branches of production. If the market-value were determined by the average technique, but the more efficient technique were capable of expanding production, this would lead to an expansion of the more efficient technique and a breakdown in the condition of equilibrium between industries. The determination of market-value by the average technique when another technique is capable of expanding supply can not, in Rubin's view, correctly represent the socially necessary labor. The sale of the commodity at a market-value determined by the average technique would imply a higher (or lower) than average rate of profit for the technique capable of expansion (or contraction). It would thus imply a breakdown in the condition of equilibrium since the quantity produced in the industry would be subject to change. Thus the ability of the various techniques to expand alter the level of output must be considered in determining the socially necessary labor required for the production of each commodity.

Alternatively, if the market-value is directly affected by the variations in demand, demand represents an independent source of value. The connection between the micro sense of socially necessary, production according to average skill and intensity, and the macro sense, production in proportion to existing social need, is severed. Market-value becomes conflated with market price and the quantitative determination of value according to labor expended in production is lost. According to Rubin then, the second sense of socially necessary cannot refer to the determination of market-value itself; rather, it must refer to the *deviation* of market price from market-value. For Rubin, a consistent interpretation of Marx's theory of value depends upon maintaining this distinction.

Rubin thus rejects the view that the two senses of socially necessary are necessary to determine the market-value of a commodity. Changes in the effective demand for a commodity can only affect the value of a commodity by changing the amount of labor socially necessary in the first sense. For example, if the demand for a commodity should rise, this may bring about a change in the conditions determining the market-value of a commodity as the quantity produced of the commodity increases. However, the value in this case continues to be entirely

determined by the quantity of socially necessary labor defined in the first sense: a quantity determined with reference to the various techniques of production for the commodity or the conditions which restore equilibrium between supply and demand among industries.⁷ In this way the dominance of the conditions of production in the determination of value is maintained.

Rubin is concerned that allowing a direct role for demand on the magnitude of value will undermine the claim that value results only from the expenditure of labor in production. In order to protect this position however, he substitutes his own interpretation of the determination of market-value in place of Marx's own suggestion of how changes in demand affect market-value. He defends the substitution in part by an appeal to the need to maintain a condition of equilibrium and applies the second sense of socially necessary labor not to the value category itself, but to the relationship between market-value and market-price.

Rubin has influenced a number of contemporary theorists. Itoh (1988) and Shaikh (1981) following the work of Uno, argue that the integration of demand affects the determination of the market-value and price of production in the way that Rubin suggests. The determination of market-value and price of production in conditions of excess demand or supply requires the identification of a "regulating capital" in each industry – a technique of production which is responsible for changes in the level of output. Unlike a linear production approach, they assume a skewed distribution of output in which one of the three techniques of production dominates.⁸

The exchange-value is defined with reference to the most efficient generally available technique of production since it is this technique that determines the price at which there is no incentive for producers to enter the industry. Since new production must be assumed to be undertaken by the most efficient generally available technique, if the rate of profit offered by this technique is higher than average, an expansion of production in the industry will be expected to occur. A dynamic theory of price adjustments should therefore consider this "regulating" technique of production as defining the market-price of production in order to theorize market processes.

The regulating capital approach has some advantages for empirical study of price changes in the long run. Specifically, it is able to take into account the specific industry structure when analyzing the long run trajectory of prices. There are, however, some difficulties in applying this interpretation of market-values to the analysis of price dynamics in the short run. Sekine (1980) argues that the assumption of a single regulating capital is restrictive; it rules out cases in which more than one technique of production may respond to changes in demand. He provides an interpretation of market-value that incorporates multiple techniques in each industry responding to changes in demand. The market-value in this approach

is defined by the technique or combination of techniques capable of expanding or contracting output in response to a change in demand. At this more concrete level of analysis it is necessary to define the marginal response ratios of the existing techniques to determine the market-value since, in general, it will be a combination of a number of producers operating with different techniques that will respond to a change in demand in a given circumstance. According to Sekine, it is therefore not possible *a priori* to define the market-value or price of production because the actual response ratio are contingent on particularities that cannot be known in advance. Swanson (1989) goes further and argues that the technique capable of responding to a change in demand need not be presently in use; it is sufficient that it be generally available to producers for adoption.

None of these interpretations, however, successfully integrates the second meaning of socially necessary labor-time. Shaikh (1981) attempts to integrate the second meaning in the way suggested by Rubin – that "socially necessary" in the second sense applies only to *deviations* of market prices from exchange-values. However, in order to preserve the idea that demand does not directly affect the determination of a commodity's exchange-value, the two meanings of the term are treated inconsistently. Shaikh argues that while the first sense of socially necessary refers to the labor-time expended on the commodity and thus affects the magnitude of its value and exchange-value, the second sense does something entirely different: it specifies a relationship between the commodity's exchange-value and its market price. For example, if a commodity is produced using labor of average skill and intensity this labor is considered socially necessary in the first sense of the term and thus contributes to the commodity's value and the determination of its price of production. If the commodity is produced in a quantity which exceeds the existing social need (the effective demand for the commodity at its price of production) the labor-time is not socially necessary in the second sense. However, in this case the magnitude of the value and price of production are not affected; instead, the magnitude of the market price changes. So while the first sense of socially necessary modifies labor-time, the second sense of the term does something entirely different: it "defines the relation between [price of production] and market price" (Shaikh, 1981, p. 278). The question is: How can an adjective in the definition of value at the same time modify labor-time and specify a relation between two theoretic terms it does not modify – price of production and market price? In order consistently to incorporate both senses of the modifier "socially necessary" the supply approach needs to explain how the modifier "socially necessary" can refer both to labor-time expended with average skill and intensity and labor-time necessary for the satisfaction of existing social need.

It is important also to note that while Rubin provides a rationale for a regulating capital approach on the basis of defining a condition of equilibrium among sectors,

it is not evident that this question is the only relevant one that can be addressed using Marx's value framework. Prices of production are clearly important for examining the effects of changes in technology, rates of exploitation and turnover time on the long-run supply prices. However, the specification of multiple techniques within industries both implies and permits the analysis of the distribution of value among producers and among industries that result from short-run fluctuations in demand. This redistribution of value is interesting in its own right as it opens up the question of the efficacy of efforts to alter the distribution of demand on the ability of producers to realize surplus value. It also bears directly on the question of the long-run dynamics of prices since the availability of surplus value directly affects the accumulation process itself. By focusing on the regulating capital, these short-run variations in demand and the redistributions of value they engender are obscured. It is worthwhile therefore to ask whether Rosdolsky's interpretation of the impact of shifts in demand on market-value does, in fact, allow an analysis of the distribution of value in the short-run.

2.3. *Rubin's Contribution*

Rubin's work has the merit of clearly identifying the two senses in which labor can be considered abstract labor and while he does not reconcile how abstract labor can be quantified prior to exchange, he lays out the problem in a way that permitted later theorists to do so. By including the exchange-value as a constituent element in the value of a commodity at the level of inter-industry competition, and by showing how value and exchange-value are both aliquot shares of homogenous labor-time, Roberts (2004) successfully integrates the two senses of abstract labor identified by Rubin. In so doing the thorny question of the relationship between these two important categories is resolved. Exchange acts to commensurate independent private labor as homogeneous social labor. It expresses this labor as an aliquot part of the social whole without augmenting or detracting from the total quantity of value created by the expenditure of new labor in production.

Rubin also clearly identifies two senses in which labor can be considered socially necessary. Here, I argue that his interpretation of the second meaning overlooks an important aspect of Marx's theory of value – the analysis of the redistribution of value among producers and industries resulting from short-run variations in demand. Rosdolsky's interpretation succeeds in integrating the second sense of socially necessary and provides a promising interpretation of the role of demand in the determination of value. His analysis, however, is limited to the context of the single industry. In this context, his interpretation appears to imply that demand is a source of value. The traditional objection, raised by Rubin and others, is that by

allowing demand to affect the magnitude of value directly, the claim that only labor creates value and only surplus labor creates profit is undermined. I argue in the next section that this objection can be overcome by analyzing the role of demand in the context of competing industries. In this context, it is evident that demand acts to redistribute value from industries with excess supply to those with excess demand by changing the determination of the exchange-values of the commodities to incorporate the existence of excess demand and supply. When the determination of abstract labor is used to theorize the relationship of value and exchange-value, changes in demand can be integrated in a way that utilizes both senses of the term socially necessary. The discrepancies between the traditional and monetary approaches are reconciled.

3. EFFECTIVE DEMAND AND THE MARKET-PRICE OF PRODUCTION

Marx indicates at the end of his discussion of market-value in Chapter 10 of Volume 3, that everything said concerning the effect of changes in demand on market-value should be applied to the price of production with the appropriate modifications.⁹ By combining the insights of Roberts concerning the role of exchange in the determination of the value and exchange-value, with Rosdolsky's interpretation of the effect of changes in demand on the determination of the market-value, this task can be completed. In so doing it is possible to integrate the meanings of abstract labor and the meanings of socially necessary labor in such a way that the key insights of the traditional interpretation as well as the monetary approach are retained. A full algebraic treatment of the problem is presented elsewhere and is summarized in the appendix.¹⁰ Here, instead, I will describe the method for integrating demand in the context of competition among several industries and explain how this approach overcomes the difficulties encountered by earlier attempts to integrate demand. I will then point out several advantages of integrating demand in this way.

The concept of price of production developed by Roberts above defines the socially necessary abstract labor that each commodity represents in equivalent exchange under competitive capitalist conditions. The prevailing conception of equivalence is simply that industry-average profit rates are equalized, but for actual market prices to fulfill this condition would, of course, require that the level of demand for each commodity is just sufficient to absorb the actual quantity of output at these exchange-values. Once variations of demand are explicitly introduced into the analysis, the condition for equivalence in Roberts' sense cannot be satisfied and for that reason is no longer relevant in defining the categories of interest to Marx

in Chapter 10. The quantities of labor-time represented by (Roberts') prices of production are not socially necessary in the sense of being expended in accordance with social need. Instead, it is necessary to consider the extent of the social need for each of the commodities produced by introducing the effective demand for each of the commodities into the analysis. Excess demand for a given commodity signals that more labor is socially necessary than has been expended by the producers in that industry; deficient demand suggests the opposite. The price of production is therefore no longer relevant as the exchange-value of the commodity and it is necessary to define the market-price of production. An increase in demand leads to a rise in the market-price of production above the price of production in just the same way that market-value exceeds the average value in the context of a single industry. In the same way the range within which the market-price of production can vary is defined by the techniques of production. It is possible to solve for the range by specifying the composition of capital of two or more techniques of production within each industry and weighting these according to the share of industry output that they produce. In this way it is possible to take into account the effect of demand on the exchange-value at the level of abstraction of inter-industry competition.¹¹

Once the range within which the market-price of production can vary is defined, it is possible to determine the market-price of production that would result from a given distribution of demand. Here a number of possibilities exist. The simplest is a redistribution of demand among industries with the aggregate level of demand held constant. Provided that the shift in demand is not extreme, the market prices of production will vary within the limits set by the conditions of production. A vector of effective demand shows the number of hours of abstract labor-time socially necessary in the sense of being required to meet the existing social need. Dividing the level of demand in each industry by the output produced in each industry will give the market-prices of production for each commodity. For those industries with excess demand the market-price of production will lie above the price of production signaling that more labor than was expended in production is socially necessary for the production of that commodity.

The most efficient technique of production provides an upper limit to the quantity of value each commodity can represent in exchange. If excess demand persists at a market-price of production defined by the extreme technique, the market-price will rise above the market-price of production. This deviation, however, only occurs in the case of extreme variations in demand. In the case of normal variations in demand the additional exchange-value is distributed from industries with insufficient demand where the market-price of production lies below the price of production. Normal variations in demand do not create value; instead they redistribute value across sectors. This result resolves the main objection of Rubin

and others to the idea that demand directly alters values and exchange-values. Demand does not create value but it does redistribute value within the economy. The market-price of production becomes the key value category for analyzing the effect of changes in demand on the distribution of value.

It is important to notice that the introduction of demand does not imply that market prices are themselves forms of value. The distinction between value and exchange-value continues to apply and is used to theorize the distribution of value among producers provided demand remains within the limits of normal deviations. Abnormal demand shifts however, do imply deviations of market prices from market-prices of production in the same way market-prices deviate from market-values in the context of a single industry. A closer look at the relationship between value and exchange-value makes this apparent. It is helpful first to compare the relationship between prices of production and values and then compare it to the case of market-prices of production and values.

The difference between value and price of production shows how profit rate equalization across industries redistributes value among the different industries according to their organic compositions of capital. Within those industries value is distributed among the various producers operating with different techniques of production at varying levels of efficiency. While average profit rates are assumed to be equalized, profit rates vary among the producers operating with different techniques of production: some producers enjoy super-profit at the expense of the less efficient producers who have below average rates of profit. Value and surplus value are thus distributed throughout the productive sector of the economy in accordance with the conditions of supply prevailing in each industry and in the productive sector as a whole. The exchange-value (the price of production) defines the aliquot share of the total homogenous average labor-time (the socially necessary abstract labor) each unit of output represents in exchange when exchange occurs at specific ratios consistent with profit rate equalization. Notice that only the first (micro) sense of socially necessary labor-time is relevant because for this profit rate equalization to occur we assume market-clearing – all output is purchased at these ideal prices.

The value of each commodity is the aliquot share of the total average homogenous labor-time (socially necessary abstract labor) needed to produce a unit of the commodity given that the inputs must be acquired through exchange and assuming exchange occurs at these ideal prices. The inputs to production must be valued at their prices of production because they are not produced by the producers of the final output but purchased at their prices of production. The difference between value and exchange-value shows how this socially necessary abstract labor-time is redistributed as a result of the tendency toward profit rate equalization. The prices of production of commodities with low organic compositions of capital

will be below their values and this value gets siphoned off to those industries with high organic compositions of capital whose prices of production are above their values. For each commodity the difference between the value and price of production defines the per unit gain or loss in value that results from exchange on the basis of equal rates of profit.

With the introduction of demand the market-price of production replaces the price of production as the relevant exchange-value. The market-price of production takes the analysis a step further by asking how the distribution of value is affected by variations in demand such that profit rates are not equalized. The exchange-value is now defined by the market-price of production: it is the quantity of socially necessary abstract labor that each commodity represents in equivalent exchange where the conditions defining exchange equivalence now incorporate the second (macro) sense of socially necessary labor-time and thus take into account the level of effective demand for each of the commodities in addition to the conditions of supply. Labor-time that is not socially necessary does not count fully as exchange-value; commodities that are overproduced count for less of the total abstract labor than they otherwise would. Commodities for which there is excess demand, on the other hand, represent more socially necessary labor-time in exchange. The market-price of production is the further development of the exchange-value that takes into account this second sense of socially necessary at this more concrete stage of the analysis.

The value is the socially necessary abstract labor-time required for production where the inputs must be obtained under the prevailing conditions of exchange, i.e. with the prevailing distribution of demand for output in each industry. Both production and exchange in this way affect the commodity's value. On the production side, the compositions of capital within the industries and the weights accorded to the different producers according to their level of output help to determine values. On the exchange side, the value is a quantity of abstract labor because exchange ratios are used to determine what the inputs into production are worth. At the same time, it is a quantity of socially necessary labor-time because the quantity of labor-time represented by the inputs to production is affected by the level of effective demand. This quantity is only given once the techniques of production, levels of output *and* distribution of demand is specified.

The difference between a commodity's value and its market-price of production defines the per unit gain or loss in value accruing to the industry as a result of the conditions of production and the prevailing distribution of demand. This gain or loss in value is shared among the individual producers in the industry according to their respective techniques of production and levels of output. Access to additional value, whether resulting from changes in the technique of production or the existence of excess demand, represents an important advantage for firms in

the industry in their competitive struggle. It will affect the decisions of these firms concerning output levels and accumulation and therefore ramify throughout the productive sector of the economy. The analysis of competition therefore needs to take into account the effect of changes in demand on the distribution of value in the short run. The market-price of production is the category that allows this analysis within Marx's carefully developed theory of production and exchange. Marx refers to this further development of exchange-value necessary to incorporate demand in the following passage:

This quantitative limit to the quota of social labor-time available for the various particular spheres of production is but a *more developed expression* of the law of value in general, *although the necessary labor-time assumes a different meaning here*. Only just so much of it is required for the satisfaction of social needs. The limitation occurring here is due to the use-value. Society can use only so much of its total labor-time for this particular kind of product under prevailing condition of production.

(1959, p. 636)

The integration of the double meanings of socially necessary applied in this way provide a method of taking into account the effect of both conditions of production and exchange on the determination of value and exchange-value. Value and exchange-value can be defined under conditions of excess and deficient demand in the short run and the shifts in value that occur as a result of these changes can be theorized in the short run.

The major difficulties encountered by the abstract labor approach to value are overcome. Exchange is integrated into the process of determining abstract labor: it is the prices of production of the means of production which determine how much labor is transferred to the final product. While the total value in the period is determined by the total labor expended in production, the distribution of that labor to specific commodities occurs only through the process of exchange. The claim that abstract labor is determined through exchange but some quantitative determination of value can be made prior to exchange is demonstrated.

Secondly, demand is given a role in the determination of value and exchange-value without itself representing a source of value. Once the solution to the problem of abstract labor is resolved, Rosdolsky's interpretation of how demand affects the determination of the market-value can be generalized to competition among producers in different industries. The second macro sense of socially necessary labor-time – labor expended in proportion to the expressed social need for the product, is incorporated. As with the process of exchange, demand itself does not alter the total value created in the period; instead it redistributes that value to the various producers according to the strength of effective demand for their output.

The integration of demand has several advantages over the traditional and monetary interpretations. First, in the case of normal shifts in demand, the

market-price of production is fully defined even when demand and supply are not assumed to coincide at the commodity's price of production. Since the market-prices of production are used to define the revenues and costs of the producers, their rates of profit are also defined. Value categories can therefore be used to analyze the distribution of value due to variations in demand in the short run.¹² This analysis augments the use of prices of production to analyze long-run tendencies by showing how short-run changes in demand affect the distribution of value within the economy. While much work needs to be done to apply the concept of market-price of production to the analysis of competition in the short run, the way is now open to analyze changes in the short run using the value categories themselves.

Second, this approach offers some interesting insights into the inter-temporal redistribution of value caused by changes in aggregate demand from one period to the next. In order to explore these insights, two further possibilities concerning fluctuations in demand need to be theorized. First, extreme shifts in demand that imply a deviation of the market price from the market-price of production need to be examined. These extreme divergences are not necessarily offsetting and it raises the possibility that more or less exchange-value will be realized in a period than was created in the period. The question of how this effective demand is financed raises important questions concerning the transfer of value between periods. Second, aggregate demand may exceed or fall short of aggregate supply in the period with a similar result. In this case the question of the existence of stocks of inventory needs to be examined. The present analysis by abstracting from changes in inventory implies the restrictive assumption that the elasticities of demand for all commodities are unity. While this assumption does not affect the overall argument concerning the conceptualization of market-prices of production and the transfer of value among industries due to the variations in demand that they imply, a more developed analysis would allow for the specification of different elasticities of demand.

4. CONCLUSION

By distinguishing the effects of exchange on the determination of abstract labor from the effect of demand on the determination of socially necessary labor a consistent Marxian microeconomic theory of value results. Demand and supply conditions act together to determine the value and exchange-value attributed commodities in production and exchange. The theory provides a framework for analyzing how changes in the supply conditions or demand conditions affect the distribution of value among producers within an industry and across industries in the short run.

The key insights of both the traditional and monetary approaches to the question raised at the outset have been retained. Since neither exchange nor demand affect of overall magnitude of value, the important claim of the traditional approach that labor is the sole source of value is maintained. Because exchange and demand both serve to distribute that value among producers in the productive sector, the idea that private labors are articulated into a social division of labor through commodity exchange is likewise preserved. Both the theory of exploitation and the theory of commodity fetishism remain central to the analysis of how values and prices are formed. A rich analysis of capitalist competition is made possible by the multifaceted concept of value defined as socially necessary abstract labor-time.

NOTES

1. The monetary expression of labor-time is defined as the ratio of the price of the net product in a given period to the hours of new labor expended (Foley, 1982, 2000). For an analysis of issues concerning the use of the monetary expression of labor-time see (Saad-Filho, 1996).

2. See also the article by Roberts in the present volume.

3. Algebraically, this implies that Eq. (1) from the appendix replaces the traditional formulation of the value equation $V = VA + L$. Equations 1–3 in the appendix represent a formal expression of the relationship between value and exchange-value proposed by Roberts. The value of the one hour of material and equipment used in production in the above example is thus given by the prices of production of those components of constant capital and not by their direct labor requirements.

4. In fact, Marx considers both supply conditions only in the first case of just sufficient demand. In the case of normal and extreme variations in demand he uses only the skewed supply although his argument would apply equally well to the case of balanced supply.

5. Returning to the simple example from the previous section, suppose now that three producers are responsible for the total production of the commodity. The less efficient producer produces it with an individual value of 2.5 hours, the more efficient 1.75 hours and the middle producer 2.25 hours. Suppose that 50 units are produced in total and the more efficient producer produces a greater proportion of the output such that the average value or market-value is 2 hours. One hundred hours of social abstract labor are expended in the production of the commodity. Using the monetary expression of labor time of \$50/hr from the previous example and assuming demand is just sufficient to purchase the output at its market-value the one hundred hours exchange for \$5000 or \$100 per unit. All one hundred hours are socially necessary for the production of the commodity.

Now suppose that demand varies. If demand greatly exceeds supply, the market-value can equal the individual value of the less efficient producer. If the 50 units sell for \$6250 then the market-value rises from \$100 to \$125 and 2.5 hours per unit or 125 hours are "socially necessary" for the production of the commodity. Here, the market-value equals the individual value of the less efficient producers and the upper limit to the variation in

the market-value is reached. This outcome implies that although 100 hours went into the production of the commodity, 125 hours were, in fact, socially necessary after taking into account the effective demand. If the output sells for more than this amount the market-price will rise above the market-value of \$125 or 2.5 hours. Alternatively, if demand only slightly falls short of supply it will equal the individual value of the more efficient producer in this case. If the total output is sold at only \$4375 then 87.5 hours were "socially necessary." Each of the 50 units is worth only 1.75 hours or \$87.50. A further reduction in demand would lower the market price below the market-value. In this way the conditions of supply determine the range within which the market-value can vary and the demand determines the magnitude of the market-value within that range.

6. Carchedi (1996) argues that market-prices are affected by variations in demand and that these market-prices act to overdetermine prices of production. Lianos and Droucopoulos (1992) do not address the question of socially necessary labor-time.

7. Even the conditions leading to the original change in demand can, according to Rubin, be explained on the basis of changes in the productive forces in society. He gives the example of a campaign against the use of alcohol as an example and argues that the conditions for such a campaign can be explained "in the last analysis" with reference to changes in the productive forces (1973, p. 194).

8. Semmler (1984) analyzes the relationship between market-prices and prices of production using a linear production approach in which the industry average defines the price of production and demand affects only the magnitude of the market-price. He concludes that this approach is unable to analyze either the distribution of value or the dynamics of prices in the short-run.

By using linear production models for depicting the Marxian theory of value, we might encounter some problems with regard to the *economic adjustment process*, or the market process that leads to the new values as derived above as centers of gravity for market prices. . . . Such an adjustment process . . . may be hard to imagine, since not only does it presuppose a perfect mobility of capital and labor and very high flexibility of prices and quantities in industries, to allow the market process to establish the new centers of gravity; it also presupposes that during the adjustment process no new technical change is initiated by the prevailing market prices. We can conclude from this that long-run relative prices derived from linear production models, in certain cases, might not be very relevant as centers of gravity for market prices.

(1984, pp. 30, 31, original emphasis)

See also Hollander (1981) for a further discussion of the use of the linear production approach.

9. "What has been said here of market-value applies to the price of production as soon as it takes the place of market-value" (1959, p. 179). Our analysis has revealed how the market-value (and everything said concerning it applies with appropriate modifications to the price of production) . . . (1959, p. 198).

10. The effect of a shift in demand between two industries on the determination of value and exchange-value and the resulting redistribution of value among producers within and across industries is developed in Kristjanson-Gural (2003).

11. Algebraically the matrix of technical coefficients and the vector of new labor inputs are partitioned to include two or more techniques of production for each commodity. The techniques are weighted according to the quantity of the total output they contribute. For further elaboration see appendix.

12. Further, since market prices of production are defined with reference only to total demand and quantity of output, they are easily measured and amenable to quantitative work using existing data.

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APPENDIX

The following two industry model of simple reproduction is sufficient to define the market prices of production in the limited case of a shift in demand between two industries prior to changes in output. The model abstracts from changes in aggregate demand, the existence of stocks of fixed capital and assumes zero inventories. It is further assumed for simplicity that the determination of the market-price of production in Industry 2 lies within the conditions defined by the extreme techniques of production in that industry; only the average technique in Industry 2 is therefore defined.

Equation (1) defines the value of commodities and Eq. (2) the prices of production under the assumption of just sufficient demand subject to the net product normalization expressed in Eq. (3):

$$V = PA + L \quad (1)$$

$$P = PM(1 + r) \quad (2)$$

$$PY = LX \quad (3)$$

Where: $V = 2 \times 1$ row vector of labor values; $A = 2 \times 2$ matrix of commodity inputs per unit output; $L = 2 \times 1$ row vector of new labor inputs per unit output; $P = 2 \times 1$ row vector of production prices in units of labor time; $M = [A + BL]$; $B = 1 \times 2$ column vector of wage goods advanced per hour; $r =$ general rate of profit; $Y = 1 \times 2$ column vector of net output; $X = 1 \times 2$ column vector of gross output.

To incorporate the extreme techniques of production, the vectors and matrices of Industry 1 in the above system are partitioned and expanded to include the two techniques of production. Output in Industry 1 is divided between these two techniques such that the more efficient technique ($X1+$) uses more constant capital and produces more output than the less efficient technique ($X1-$).

$$V^x = PA^x + L^x \quad (4)$$

$$V^x = PM^x R$$

$$\text{Where } X^x = \begin{pmatrix} X1+ \\ X1- \\ X2 \end{pmatrix}, \quad A^x = \begin{pmatrix} A11 + A11 - |A12 \\ A21 + A21 - |A22 \end{pmatrix}$$

$$L^x = [L1 + L1 - |L2] \quad (5)$$

Assuming no product differentiation, the price of production for both producers in Industry 1 is given by $P1$ from Equations 1–3 above. The extended price vector $P^x = [P1 \ P1 \ P2]$ can be used to determine the individual rates of profit for the two firms in Industry 1. These are contained in the diagonalized matrix R where:

$$R = \begin{pmatrix} 1 + r_1 & 0 & 0 \\ 0 & 1 + r_2 & 0 \\ 0 & 0 & 1 + r_3 \end{pmatrix}$$

The magnitude of the market prices of production within the range defined by the techniques of production is determined by introduction of a vector of effective demand (D) that defines the total quantity of the two goods demanded, i.e. the amount of labor-time socially necessary in the second sense. The market prices of production are given by $P^M = [P^{M1} \ P^{M2}]$ as follows:

$$P^M = DX^{-1} \quad (6)$$

Subject to $r_{1b} \leq r_g \leq r_{1a}$

where $D = 1 \times 2$ row vector of effective demand; $X = 2 \times 2$ diagonalized matrix of total output in physical units.

The constraint on the rates of profit of the two producers in industry one defines upper and lower limits of the movement of the market-price of production as demand shifts between Industry 1 and Industry 2. Once the rate of profit of one of the producers reaches the general rate of profit, the market-price of production has reached the limits imposed by the techniques of production. Any further variation in demand in that industry will cause a deviation of the market-price above the market-price of production.

The limit of the market-price of production in Industry 1 (P_1^L) is found by solving for $P^L = [P_1^L P_2^L]$ subject to the constraint that the rate of profit of one of the extreme techniques of production in Industry 1 is just equal to the general rate of profit. The profit rate of the more efficient technique is denoted r_{1a} and the less efficient technique is denoted r_{1b} . In the case of deficient demand, it is the more efficient technique 1a that provides the limit and in the case of excess demand it is the less efficient technique. Hence:

$$r_{1a} = r_g \quad (7)$$

where $r_{1a} = [P_1^L X_1^x - P^L M_1^x] / P^L M_1^x$; $r_g = [P^L X^x - P^L M^x] / P^L M^x$; $P^L = [P_1^L P_2^L]$; $X_1^x =$ 1st row of vector X^x ; $M_1^x =$ 1st column of matrix M^x . and

$$r_{1b} = r_g$$

where $r_{1b} = [P_1^L X_2^x - P^L M_2^x] / P^L M_2^x$.

To solve for P^L we can apply an aggregate demand constraint as follows:

$$P^L X = P X \quad (8)$$

Since P , the vector of production prices is known, there are now two equations with two unknowns and the limits can be determined.