The Long-Period Method and Marx's Theory of Value

by Duncan K. Foley
Department of Economics
New School for Social Research
79 Fifth Avenue, New York, NY 10003
foleyd@newschool.edu *

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Abstract

This paper reconstructs Marx's theory of value in the context of the long-period method of the classical political economists centered on the distinction between market prices and natural prices around which they gravitate. The theory of value stems from considering the abstract problem of the self-organization of a division of labor through the exchange of products as commodities. The commodity law of exchange, in which natural prices are proportional to social labor time necessary to produce commodities follows from assuming free mobility of labor. The capitalist law of exchange, in which natural prices equalize profit rates in different sectors arises from the assumption of free mobility of labor and capital. The classical political economists and Marx viewed labor at a level of abstraction where it is fungible between employments and skills. The theory of value is the full account of the allocation of universal labor and the emergence of natural prices in these abstract systems. Confusions in interpretation of the the theory of value are traced to inconsistent terminology and Marx's polemical stance as a socialist revolutionary.

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1 Introduction

This paper reconstructs the method and logic underpinning Marx's theory of value.

This reconstruction emphasizes the continuity between Marx's work and the classical political economy of Smith and Ricardo. I argue that Marx accepted and developed the "long-period" method of these authors as the appropriate way to analyze the complex interactions of the capitalist economy. The key abstraction of the classical political economy tradition, the commodity system of production in which the division of labor is organized through exchange of products as private property with free mobility of labor and capital, is also the core of the hierarchy of abstractions Marx lays out in the original (but long unpublished) Introduction to the *Contribution to the Critique of Political Economy* (hereafter *CCPE*), which is printed as an appendix to Maurice Dobb's edition. The application of the method Marx exposits in this Introduction to the commodity system of production yields his theory of value, with one further assumption. This further assumption is that at the time-scale (or level of abstraction) appropriate to this analysis, human labor is completely fungible between concrete employments, and therefore has a "universal" character (in the language of the *CCPE*).

This reconstruction, I believe, logically validates Marx's theory of value and resolves the many puzzles associated with that theory. If it is correct, however, its conclusions require a rigorous re-thinking of the categories and terminology of Marx's theory of value.

2 The long-period method

Human understanding of the social and natural world develops through the recognition of common features of apparently disparate observed phenomena. Once these common features become apparent, they constitute an abstraction. The investigation of the world then turns to the analysis of these abstract concepts. This analysis often takes the form of the solution of a typical simplified thought-problem or "gedanken-experiment".

The key example for our purposes here was the recognition in classical political economy that underlying the production, buying, and selling of the bewildering variety of concrete commodities is a common logic of competition. Smith outlines this idea in the first Book of *The Wealth of Nations*. Each commodity is on the one hand a use-value, having some ability to meet concrete human needs directly. But the system of exchange of products as private property also endows the commodity with an exchange value, its power to exchange for other products. The actual observed ratios in which commodities exchange, their *market prices* are highly variable in time and place. Market prices, however, tend to fluctuate (or "gravitate") around central values, *natural prices*. The determination of these natural prices is the first analytical task to be faced in understanding the commodity system of production.

Classical political economy also recognized that commodity production is the reflection of an extensive division of labor in society. The exchange of products as commodities manages to organize a highly decentralized division of labor spontaneously into some kind of order that functions, if not perfectly, to meet the needs of social reproduction. From this point of view the emergence of natural prices in decentralized exchange must be closely connected with the emergent *self-organization* (to use the modern terminology of complex systems theory) of the commodity system of production.

This line of thinking leads to a thought-experiment problem. In its simplest form (which Smith evokes as a "simple, rude" state of society) this abstract problem can be characterized as follows. Suppose that a large number of producers can freely devote their time to the production of various concrete products (for example, by hunting beaver or deer), under circumstances where specialization is advantageous. Each of the producers specializing in the production of one or another commodity (perhaps in cooperation with each other) will then need to meet their reproductive needs by exchanging products with one another. Under these circumstances, specialization in any line of production must tend to lead to the same general conditions of reproduction for the producers. If hunting beaver led to persistently better conditions of reproduction than hunting deer, producers would exercise their freedom of choice to move from deer-hunting to beaver-hunting, and in the process would depress the exchange ratio of beaver in terms of deer.

The classical political economists do not seem to have imagined that this tendential adjustment would ever actually permanently stabilize the exchange value of commodities. They thought of the movement of producers from one to another concrete commodity as a ceaseless fluctuation which would be, in fact, the mirror of the ceaseless fluctations of market prices around natural prices. The two processes are, in modern language, dual to each other. Thus natural prices are characterized in this thought experiment as the exchange ratios that equalize the reproductive condition of the producers, and the emergence of natural prices is an incident in ongoing turbulent organization of the social division of labor through commodity exchange.

In their discussion of this thought-experiment the classical political economists (especially Smith) tended to summarize what I have called the "reproductive condition" of the producers as the *labor time* they have to devote to production in each specialization. (Marx elaborates this to the notion of *socially necessary labor time.*) In this language it is inevitable that the natural prices in this thought-experiment would be characterized as proportional to labor time expended in the production of each commodity. (it is convenient to refer to the outcome of this abstract thought-experiment, where natural prices are "values" proportional to embodied labor time, as the *commodity law of exchange.*)

It is crucial to this argument that producers are free to move from one line of specialization to another. (Marx later elaborated famously on the two-fold freedom of the wage laborer, freedom to sell her or his labor-power and freedom from access to means of production except by selling labor-power.) This implies above all that there are no innate personal barriers to the movement of producers from one line of production to another. Indeed, Smith, Ricardo and Marx all make explicit, though brief, remarks underlining this point. Whatever differences there are in "natural talents" among human beings are negligible from this point of view. The mass of producers will adapt themselves through training, experience, and resourcefulness to the exigencies of the division of labor in any period. (Marx refers to this process as happening "behind the backs" of the producers.) Because these exigencies are constantly changing, we would expect this process of adaptation, observed at any moment, to be imperfect and unfinished, and consequently that conditions of reproduction of producers in different lines of production would not be completely equalized. But the whole power of this abstract method lies in its rigorous focus on average conditions that spontaneously organize a complex division of labor.

It is apparent that this thought-experiment is not a reflection of the concrete conditions of the real world. Producers are never completely free to move from one specialization to another, whether because of social or political or legal or geographic obstacles. The purpose of the thought-experiment is not to give a complete account of the complexity of observed reality, but to answer the question of how a complex division of labor could self-organize under the simplest possible conditions. This question is inevitable once the common features of commodity production and exchange have become apparent and appropriate terminology has developed to pose it. The brilliance and cogency of Smith's answer to this question is at the heart of the prestige of his work, and the well-spring of later systematic economic analysis.

Anyone living in early capitalist society would recognize that probably the most important obstacle to the free movement of producers among lines of production was the growing cost of raw materials and equipment (means of production). Because producers must have access to means of production before they can actually produce, and have to produce before they can sell products as commodities, mobility of producers among lines of production would require producers who had sufficient wealth to finance these costs. If, as is normally the case in capitalist societies, most producers do not have this finance and cannot arrange to borrow, it is easy to understand that a class of capitalists who do have this finance or access to it will emerge to organize production. Marx explains the emergence of the institution of free wage-labor under these circumstances.

The introduction of capitalists into the thought-experiment changes its conditions in some important ways. It still seemed reasonable to the classical political economists to assume (as an abstraction admittedly never fully realized in reality) that workers can freely move to seek the highest available wage. This assumption, carried over from the "simple, rude" state of society, leads to the conclusion that the wage tends to be equalized across employments, since the wage is a convenient abbreviation for "conditions of reproduction" for wage-laborers. (What level the average or natural wage will tend to settle at is the next question, which has turned out to be much less tractable than the tendency of an average wage to emerge to begin with.)

But in a capitalist society, where the means of production are the property of capitalists, it is the capitalists who will determine the movement of capital among lines of production and hence the self-organization of the division of labor. The thought-experiment now allows both for the free mobility of labor (which tends to equalize wages and explains the emergence of an average wage) and the free mobility of capital. The classical political economists noticed that the incentives for capitalists differ in important ways from incentives for workers, in that capitalists will seek the highest profit rate on the value of their capital in order to achieve the most rapid potential expansion of their capital. The assumption of the free mobility of capital leads to the conclusion that profit rates (suitably adjusted for relevant differences such as risk) tend to be equalized and therefore that an average rate of profit emerges in the capitalist economy. The natural prices in this modified thought experiment have the property of equalizing the rates of profit in different lines of production. (It is convenient to refer to the outcome of this extended thought-experiment, in which natural prices equalize the rate of profit across lines of production, as the *capitalist law of exchange.*)

The assumption of the emergence of profits and the equalization of the profit rate, although it introduces sociological and political issues of great importance (the whole class division of capitalist society) leaves the basic analytical structure of the classical political economists' thought-experiment intact. We still have a unified account (in a highly simplified or abstracted setting) of how the social division of labor could be self-organized by decentralized competitive forces, and how this process would give rise to natural prices. In particular, the self-organization of the system centers on the allocation of a pool of labor that can adapt freely to the exigencies of the division of labor, just as in the even simpler account which included only freely mobile labor.

It is true that the criteria by which universal labor is being allocated have changed with the introduction of capital and the profit rate into the picture. Because capitalists are seeking the maximum profit rate, they will typically, given a choice of techniques of production, choose different techniques than freely mobile producers would, due to the presence of an incentive to economize on the cost of capital as well as labor time. The division of value produced between wages and profits will change the distribution of income and the social effective demand among commodities. When labor time becomes a cost through the wage, there are new incentives for technical change perceived by capitalists.

This whole system of concepts, including the exchange of products as commodities, the free mobility of labor and capital, the resulting tendential equalization of wages and profit rates, the emergence of natural prices around which market prices gravitate, and, in the background, the continual adaptation of the labor force to the exigencies of the division of labor, is, I submit, what the classical political economists and Marx referred to as the "theory of value". In so far as it is a theory of the adaptation and allocation of a fungible labor force to meet the needs of social reproduction it is a "labor theory of value". (Thus Smith's great innovation over his physiocratic predecessors was his clear realization that the wealth of a nation was in the first instance the result of society's organization and deployment of its human resources, rather than its natural resources or money.) It was perhaps an inevitable confusion or conflation of ideas that led later economists to identify the "labor theory of value" with one particular aspect of this story, the commodity law of exchange. Later analytical debate tended to focus on the technical issues involved in reconciling the commodity and capitalist laws of exchange. But as a result economics lost sight of the larger implications of the long-period method and point of view, its powerful account of the self-organization of the division of labor through commodity exchange and capitalist appropriation of profit. The theory of value in this larger sense was, in Sraffa's words, "submerged and forgotten".

The broad context in which Marx situated the theory of value was his (and Engels') philosophy of *historical materialism*. Historical materialism sees historical human societies as *class societies* based on *exploitation*. In a class society a small minority appropriate the surplus product of the great mass of direct producers through some system of *social relations of production*. For example, in a society where the mass of direct producers are slaves, as Marx conceived was the case for the ancient empires, including Greece and Rome, the minority class of slaveowners appropriate the surplus product (indeed the whole product, though they are required to devote some part to the reproduction of the slaves). In feudal society the great mass of direct producers are serfs bound by tradition and coercion to the land, and the small minority of lords appropriates the surplus product as surplus labor-time of the serfs, who work part of the year to feed themselves, and part of the year to tend the lord's demesne. From the historical materialist point of view the class division of society based on exploitation is the key to understanding its ideology and political history. Furthermore, the explanation of great revolutionary political and social changes in human society is to be sought in a careful understanding of the dynamics of exploitative social relations (their "contradictions" in dialectical language).

The classical political economy theory of value intersects this vision of historical materialism at several points. Because the wage in capitalist society is lower than the value that workers produce, capitalist profit at a social level represents class appropriation of a surplus product. Capitalist society is thus a class society, like societies based on slavery and serfdom. Its social relations are the institutions of free wage labor which superficially seem to assure equality of individuals as owners of private property. Much of Marx's economic analytical effort was devoted to explaining the consistency of apparent anomalies in distribution in capitalist society (such as rents) with this theory of exploitation.

3 Layering of abstractions

The hardest problem for students in learning a theory like the theory of value is to understand the role and relation of the abstractions that make up the theory. It is evident that the abstract thought-experiments that give rise to the commodity and capitalist laws of exchange, for example, are not adequate accounts of concrete observed reality. Labor and capital are never freely mobile in capitalist societies, to begin with. There are numerous legal restrictions and regulations on economic activity, including, for example, the monopolies granted as part of intellectual property rights; at any moment some established producers have abundant monopoly power, which can deter free entry of competitors; the information required to allow capitalists and workers effectively to seek out the highest profit and wage rates is far from easily available; and so forth. What is the point of a "theory" that gives the wrong answers to most of the concrete questions we want to ask? (It is not uncommon for students, seizing on one or another of these limitations of capital or labor mobility, such as intellectual property rights or dynamic technological advantage, to propose an "alternative" theory of value in which "value" reflects information, or technology.)

Smith and Ricardo follow the British tradition of teaching method by example rather than precept, leaving the reader to infer methodological principles from their discussion of concrete problems. While Smith succeeds in conveying the fundamentals of his argument in broad strokes, his detailed discussion of specific issues can leave the reader bewildered with details and overloaded with qualifications. Ricardo is rightly famous for the rigor of his thinking, which is expressed in his careful organization of his argument, the ordering of questions and conclusions, and the constant reference to the scope and generality of the abstract concepts he employs in his reasoning.

Marx actually took the trouble to write out a kind of manual for the use of abstraction in the original Introduction to the *CCPE*, but unfortunately decided not to publish it.

In this text Marx gives a stylized picture of the development of a theory in the following terms. The examination of a complex problem, such as the organization of capitalist society, begins with a general, undifferentiated conception of the whole (which Marx conceptualizes as "the population"). Careful examination of this rather inchoate notion establishes key concepts: classes, for example, and commodity and money, labor and capital:

> It would seem to be the proper thing to start with the real and concrete elements, with the actual preconditions, e.g., to start in the sphere of economy with population, which forms the basis and the subject of the whole social process of production. Closer consideration shows, however, that this is wrong. Population is an abstraction if, for instance, one disregards the classes of which it is composed. These classes in turn remain empty terms if one does not know the factors on which they depend, e.g., wage-labour, capital, and so on. These presuppose exchange, division of labour, prices, etc. For example, capital is nothing without wage-labour, without value, money, price, etc. If one were to take population as the point of departure, it would be a very vague notion of a complex whole and through closer definition one would arrive analytically at increasingly simple concepts; from imaginary concrete terms one would move to more and more tenuous abstractions until one reached the most simple definitions. From there it would be necessary to make the journey again in the opposite direction until one arrived once more at the concept of population, which is this time not a vague notion of a whole, but a totality comprising many determinations and relations.

Thus a proper use of the method of abstraction "evaporates" concrete reality into abstractions in order to reassemble an analyzed picture of concrete reality as the product of those same abstractions.

From the point of view of the main argument of this article, the key point here, which is explicit in Marx and implicit in Smith and Ricardo, is that the principles revealed by the most fundamental abstractions (such as free mobility of labor and capital) continue to be valid when more concrete determinations (such as legal regulation or monopoly) enter the analysis. In particular, the conclusions of the commodity law of exchange, which give us a simplified picture of the allocation of a fungible labor force to meet the requirements of the reproduction of society by means of the division of labor through the equalization of conditions of reproduction (the proportionality of exchange value to labor time required for the production of commodities) continue to hold under the capitalist law of exchange. How can this be, when the capitalist law of exchange implies different ratios of exchange values of commodities, and even different socially necessary labor times (due to cost-minimizing capitalists choosing different techniques of production)? Despite these quantitative differences, the capitalist law of exchange is still a process of allocating the fungible labor of a society to meet its needs of reproduction (more or less, and only in an average sense) through a decentralized spontaneous system of organization regulated by competition (free mobility). The principle of free mobility of labor still functions under the capitalist law of exchange in the tendency for the wage to equalize among different employments even though free mobility of labor no longer plays the key role in allocating labor among different employments. Furthermore, and very important from Marx's point of view, the direct producers receive a claim in the form of wages to only a part of what they produce, so that the theory of exploitation continues to apply with the capitalist law of exchange. Exploitation still has a quantitatively meaningful manifestation in the division of the labor time of society between reproducing the direct producers and producing a surplus product.

The continuing relevance of the higher order abstraction (free mobility of labor) with the additional lower order determinations (capitalist appropriation of profit and free mobility of capital) does not imply, however, that the two thought-experiments (commodity and capitalist law of exchange) coexist. The capitalist law of exchange in this sense supersedes, incorporates, and transcends the commodity law of exchange. At a fundamental level we are still examining the same problem, the allocation of a fungible labor force in a complex division of labor, and the effective appropriation of part of that labor as profit.

4 Marx's struggle for a precise terminology

Marx recognized the thought-experiment of the classical political economists, which I have called the theory of value, as a decisive "scientific" achievement. Although he spends a considerable amount of effort in his notebooks in recapitulating what I have called the theory of value, in his published work, and particularly in the notoriously difficult first three chapters of Volume I of *Capital* he often assumes that the reader is thoroughly familiar with the broad outlines of this theory and the long-period method. Furthermore, Marx saw more clearly than anyone else certain ambiguities and loose ends in the language of Smith's and Ricardo's expositions of this theory, with the result that a great deal of his discussion of this theory is an effort to create a more precise theoretical terminology. This effort involved Marx in a reformulation of the technical terminology of classical political economy. In some cases, such as the distinction between "labor" and "labor-power", this reformulation brings to prominence distinctions left conveniently obscure by Smith and Ricardo, perhaps for ideological reasons. In other cases, such as the substitution of the more precise concept of "values" and "prices of production" for the generic (and ideologically loaded) concept of "natural prices", Marx struggled to eliminate ambiguities in the classical political economy terminology. In yet other cases, such as the characterization of fungible labor as "abstract" or "universal" labor, Marx sought language that would pinpoint important concepts inherent in what I have called the theory of value but left unexplored by Ricardo and Smith. Each of these issues is worth discussion, because each of them has left a residue of confusion and controversy in the later development of Marxist economics.

4.1 Labor and labor-power

Smith and Ricardo use the single word "labor" to refer to the services of labor which are bought and sold for the wage and for the laboring activity that adds value to commodities. This is a key point for Marx, because it is due to the difference between the money wage paid by the capitalists and the money value added created by the labor effort of workers that capitalists can appropriate part of the product of society as profit. Marx therefore introduced the term "labor-power" to refer to the capacity to labor productively and thereby add value to commodities, which is actually acquired by the capitalist in exchange for the wage. Marx reserves the term "labor" for actual laboring activity which results in a commodity with exchange value. In Marx's way of thinking it is possible to exchange labor-power for money (in a wage contract), so that labor-power can be viewed by analogy as a commodity. But it is impossible to exchange labor itself for money, because labor is an activity; it is only possible for the capitalist to sell the commodity *product* of labor, which embodies the value (and surplus-value) created by the laboring activity. The sense in which labor-power is a commodity is subtly but significantly different from the sense in which the product of labor is a commodity. For one thing the product of labor is also a product of the social division of labor, organized through exchange, but labor-power is not. Labor-power is reproduced in a much wider range of social relations that involves the family and state.

4.2 The value of labor-power

The invention of the term "labor-power" (which Marx regarded as his most important theoretical contribution to political economy) was for the most part a success, and has even made some inroads into the terminology of mainstream economics. It led, however, to a parallel problem in the naming of value categories which has been less satisfactorily resolved. If labor-power is a commodity, what is its value? The money price of labor-power is universally called the "wage". The long-period method then requires us to distinguish the "market wage" from the "natural wage" around which market wages gravitate. In the commodity law of exchange the natural price of a commodity (proportional to the socially necessary labor time required to produce it) is often referred to as the "value" of the commodity. By a slight abuse of language the value of a commodity, which as a natural price would be an amount of money for which the commodity exchanges on average over a long time period, is often regarded as the labor time equivalent of this money under the commodity law of exchange. In this way of talking "values" are expressed directly in labor time. Marx therefore refers to the natural wage, or more precisely, to the labor-time equivalent of the natural wage, as the "value of labor-power".[1]

But in order to complete the circle of concepts involved in the theory of capitalist exploitation, we need to have some way to refer to the value labor actually produces, which will typically be larger than the value of labor-power, thus allowing for the appropriation of a profit by the capitalists as a class. If we measure the value of labor-power in labor-time units, as Marx tends to do, we must also measure the value labor produces in labor time, which leads to an identity, since an hour of average socially necessary labor is an hour of socially necessary labor. This point is logically unassailable, but inevitably somewhat confusing. The confusion arises from the tendency to use the term "value" interchangeably as the money value added produced by the expenditure of labor and as the labor time itself.

If we continue to express the natural wage in money units, then we need a term for the money value produced per hour of average socially necessary labor. Marx does not, unfortunately, explicitly define this concept, though he continually uses it implicitly in translating between labor time and money. In the last quarter of the twentieth century Marxist scholars began to refer to this concept as the *monetary expression of labor time*, or *MELT*. The ratio of the natural wage expressed in money to the *MELT* is a pure number (normally a fraction) which expresses the proportion of the value created workers receive as the wage, or the proportion of the labor time expended workers are compensated for by the labor time equivalent of the wage.

[1]The determination of the natural wage was a point of controversy and difference among the classical political economists. Smith views wages as having a subsistence floor, but likely to be pulled above this floor in periods of rapid economic growth and high demand for labor. Malthus put forward a very influential theory of the natural wage as regulating demography through its influence on fertility and mortality, thus giving some theoretical content to the notion of a "subsistence" wage. Malthus' theory can be viewed as an attempt to apply the method of long-period equilibrium to labor supply. Ricardo tended to accept something like Malthus' demographic theory. Marx criticized Malthus fiercely for presuming that there was any universal theory of demography independent of specific social relations of production. But Marx also had a strong political investment in the idea that wages would be pushed down to a minimal subsistence level. Marx has at least two possibly inconsistent theories of the determination of the natural wage, or the value of labor-power. One is rooted in the concept of a subsistence level for the standard of living of workers, which determines the labor time required for workers to reproduce themselves. The other emphasizes the competition in the labor market from the latent reserve army of labor.

4.3 Value, natural price, and prices of production

Classical political economy begins its analysis, as we have seen, by distinguishing the market price of a commodity, which fluctuates continually from day to day, and the natural price of the same commodity, the central tendency around which the market price moves. At what we now recognize as two levels of abstraction, classical political economy gives different explanations of what determines the natural price of a commodity. In the "simple, rude" state of society in which commodity exchange organizes a division of labor among direct producers without the separate ownership of means of production as capital, the commodity law of exchange operates, and the natural price of commodities is proportional to the labor time required on average to produce them. In a very simplified capitalist society in which means of production are appropriated as capital, but there is completely free mobility of both labor and capital, the natural prices of commodities equalize the profit rate across lines of production (when labor-power is purchased at the tendentially uniform natural wage and capitalists choose techniques of production that minimize costs). Thus the term "natural price", which is unambiguous enough in its contrast to "market price", becomes ambiguous depending on whether the context is the commodity law of exchange or the capitalist law of exchange.

Marx makes a systematic attempt in Volume III of *Capital* to establish an unambiguous terminology, in which the profit rate-equalizing "natural prices" of the capitalist law of exchange are referred to as *prices of production*.[2]

> The price of production includes the average profit. We call it price of production. It is really what Adam Smith calls natural price, Ricardo calls price of production, or cost of production, and the physiocrats call prix nécessaire, because in the long run it is a prerequisite of supply, of the reproduction of commodities in every individual sphere. But none of them has revealed the difference between price of production and value. We can well understand why the

[2]Marx relates prices of production to the *cost-prices* of commodities, which are the sum of the constant and variable capital required to produce a unit of the commodity, and thus are proportional to prices of production with the factor of proportionality being $1 + r$, where r is the average profit rate.

> same economists who oppose determining the value of commodities by labour-time, i.e., by the quantity of labour contained in them, why they always speak of prices of production as centres around which market-prices fluctuate. They can afford to do it because the price of production is an utterly external and prima facie meaningless form of the value of commodities, a form as it appears in competition, therefore in the mind of the vulgar capitalist, and consequently in that of the vulgar economist. (*Capital*, III, chapter 11)

Marx generally avoids using the term "natural price" altogether (except when, as in the passage just quoted, he explicitly relates his terminology to the language of Ricardo and Smith). But what term does Marx use to denote the natural price of the commodity under the commodity law of exchange? The passage above suggests that Marx thought of the natural prices of the commodity under the commodity law of exchange (where exchange values are proportional to the socially necessary labor time expended in the production of each commodity) as *values*. This is almost an adequately unambiguous terminology, but has left its own wake of confusion in later discussion.[3]

First, as we have seen, Marx tends to translate freely from expressing exchange values in terms of socially necessary labor time to expressing them in terms of their money equivalent using the *MELT*. Under the commodity law of exchange these shifts of terminology are relatively harmless, since there is a transparent one-to-one relationship between the exchange value of any commodity expressed in money and in socially necessary labor time. Under the commodity law of exchange the amount of socially necessary labor expended to produce the commodity is equal to the labor time equivalent of its money price, that is, its natural price divided by the *MELT*. But when we move to the capitalist law of exchange there is a possible discrepancy between the actual amount of fungible socially necessary labor expended to produce a commodity (or any bundle of commodities, such as workers' consumption) and the labor time equivalent of the money price of that commodity (or bundle of commodities). This discrepancy is related, as I will discuss below, to the need to choose between analyzing cap-

[3]Marx sometimes uses the term *market-value* to describe the natural price of commodities under the commodity law of exchange: "For a commodity to be sold at its market-value, i.e., proportionally to the necessary social labour contained in it,... (*Capital* III, 10)"

italist society from the point of view of exploitation and the point of view of social reproduction. But it is hard to see how much misunderstanding could arise from the decision to use the term "value" to mean what the classical political economists called the "natural price" of commodities under the commodity law of exchange, allowing context to determine whether the units in which value is expressed are money or labor time.

But there is another subtle point involved in moving from the commodity to the capitalist law of exchange. Because capitalists choose techniques of production to minimize costs including the cost of means of production, the labor time socially necessary to produce commodities at prices of production with the capitalist law of exchange will in general differ from the labor time that would be required to produce the same commodity under the commodity law of exchange. Thus, if we reserve the term "value" for the natural price of a commodity under the commodity law of exchange, these values will not necessarily accurately reflect the amount of social labor devoted to producing the commodity under the capitalist law of exchange. The difficulty here is that Marx sometimes uses the term "value" to mean the amount of social labor time expended in the production of the commodity under the capitalist law of exchange. This ambiguity is related to the issue of the "single system" discussed above. There really seems to be no reason, except perhaps pedagogy, to spend any effort determining what the natural prices of commodities would be in the absence of capitalist competition, but with a capitalist choice of technique.

I suspect that these ambiguities in Marx's uses of the term "value" stem from his political perspective as a socialist revolutionary. Roughly speaking, Marx's political program was the socialization of the surplus product produced by capitalist society and hence under prerevolutionary social relations appropriated by the capitalists. It seems inevitable that a revolutionary upheaval and the reorganization of the social division of labor under socialist institutions would change techniques of production, and thus render obsolete the measures of social surplus product with a capitalist organization of the economy.

4.4 Universal, abstract, and concrete labor

Marx followed the classical political economists in regarding labor as, at least over a long time horizon, uniform, homogeneous, and adaptable, or as I have described it here, fungible among different employments. Smith and Ricardo's comments on this point are rather brief and elliptical. Smith, for example, says "The difference of natural talents in different men is, in reality, much less than we are aware of; and the very different genius which appears to distinguish men of different professions, when grown up to maturity, is not upon many occasions so much the cause, as the effect of the division of labour." (*Wealth of Nations* Book 1, ch 2). Ricardo emphasizes the practical equalization of labor of different qualities:

> In speaking, however, of labour, as being the foundation of all value, and the relative quantity of labour as almost exclusively determining the relative value of commodities, I must not be supposed to be inattentive to the different qualities of labour, and the difficulty of comparing an hour's or a day's labour, in one employment, with the same duration of labour in another. The estimation in which different qualities of labour are held, comes soon to be adjusted in the market with sufficient precision for all practical purposes, and depends much on the comparative skill of the labourer, and intensity of the labour performed. The scale, when once formed, is liable to little variation. If a day's labour of a working jeweller be more valuable than a day's labour of a common labourer, it has long ago been adjusted, and placed in its proper position in the scale of value. (*Principles of Political Economy and Taxation*, ch 1)

Since differences among people in both their line of work and ability to command a wage are among the most immediate and important features of modern capitalist societies, this point of view is not immediately intuitive. But it underpins the theory of value as a theory of the allocation of fungible labor across lines of production. The process by which this occurs for the classical political economists and Marx is quite analogous to the way competition tends to equalize the rate of profit, and depends in the same manner on the strong abstract assumption of completely free mobility of labor among employments. If one line of work has a higher wage than the average, workers will tend to shift to it. In capitalist society the acquisition of skills tends to be a part of the whole human life-cycle, so that this shifting of labor among employments is a complex dynamic process with long time-lags. Young people entering the labor force have to predict lifetime incomes on different paths of education, skill acquisition, and labor market experience. It is plausible that with correct information this process could result in an equalization of life-time reproduction conditions across workers choosing different employments. Of course the information on which workers make these decisions is far from perfect, but there is no reason to assume that their decisions are systematically biased in favor of or against one or another line of production. Furthermore, racial and gender discrimination, cultural traditions, and the uneven diffusion of information across complex modern societies constitute important qualifications to the abstract notion of free mobility of labor (over time), just as legal restrictions and monopolies qualify the principle of free mobility of capital. Furthermore the idea of competition equalizing conditions of reproduction is not identical to the equalization of lifetime earnings, as Smith explains in his chapter on differences in wages in different employments. In modern economic language what tends to be equalized by the free mobility of labor is some measure of lifetime utility across occupations.

The classical political economists thus were reasoning at a level of abstraction (or, what amounts to much the same thing, over an average time horizon) at which rents to different employments can be regarded as transient. At any moment in time some employments command rents, which may be quite large, due to the imperfect adaptation of the labor force to the needs of the division of labor. But the existence of these rents provide incentives to alter the patterns of training and employment so as to eliminate them. As in the case of the average rate of profit, the system never arrives at its tendential equalized wage as an equilibrium, but will be observed in a state of constant turbulent fluctuation around the equalized wage.

One might question how relevant this extreme abstraction is to real-world economic problems, given the long time-lags involved and the large and long-lasting excursions away from equilibrium the system is likely to experience. Smith and Ricardo were comfortable in taking such a long view because they deprecated economic policy based on moving transient rents among sectors of the population through regulation, taxation, tariffs, subsidies, and similar measures. In their view the insights of political economy addressed very long-run questions of how the state could provide the framework for the spontaneous organization of the market. Marx was also comfortable with the long view but for the very different reason that he thought the whole capitalist system was transient, and therefore that tinkering with its dysfunctions through policy was of secondary importance to organizing a revolutionary change in the social relations of production.

The assumption that labor is fungible has important implications for the theory of value. It authorizes the equivalence (which was particularly important to Marx) of labor time (in the generalized potential sense) and money value added. The basic puzzle here is that money is inherently one-dimensional, while commodities take a huge variety of concrete forms. Marx argues that "behind the backs" of the producers the equalization of different concrete forms of labor, which produce the different concrete commodities, is going on.[4] Thus the extremely precise measures of money prices are a reflection of the real, if only tendential and imperfect, process by which labor is being allocated to meet the exigencies of the social division of labor. It was crucial to Marx's revolutionary political economy to insist that this correspondence of money to social labor time could only ever be an approximate tendency requiring the existence of markets, the fluctuation of market prices, and the whole "anarchic" process of the spontaneous organization of capitalism. His polemical opponents among left-wing revolutionaries proposed to solve the problem of capitalist exploitation in one way or another by keeping the commodity and money system of organizing production, but enforcing an immediate correspondence between social labor time and money, through such schemes as labor-certificate moneys. Exactly how Marx thought a revolutionary socialist society might organize the social division of labor is less clear than his very sharp critique of the fantastical and "utopian" character of these schemes.

In his pursuit of this debate with other socialists, Marx was led to elaborate on the concept of fungible labor, and to move toward a precise technical vocabulary to refer to it. It was difficult, however, for Marx to invent a terminology that accurately evoked the idea that the fungibility of labor in capitalist society is an ongoing process, a potential that is constantly being realized, or in more traditionally Hegelian terms, "becoming" rather than "being". In the *CCPE*, for example, Marx explains:

> To measure the exchange-value of commodities by the labour-

[4] "The different proportions in which different sorts of labour are reduced to unskilled labour as their standard, are established by a social process that goes on behind the backs of the producers, and, consequently, appear to be fixed by custom. For simplicity's sake we shall henceforth account every kind of labour to be unskilled, simple labour; by this we do no more than save ourselves the trouble of making the reduction." (*Capital*, I, ch 1)

time they contain, the different kinds of labour have to be reduced to uniform, homogeneous, simple labour, in short to labour of uniform quality, whose only difference, therefore, is quantity. This reduction appears to be an abstraction, but it is an abstraction which is made every day in the social process of production. The conversion of all commodities into labour-time is no greater an abstraction, and is no less real, than the resolution of all organic bodies into air. Labour, thus measured by time, does not seem, indeed, to be the labour of different persons, but on the contrary the different working individuals seem to be mere organs of this labour. In other words the labour embodied in exchange-values could be called human labour in general. This abstraction, human labour in general, exists in the form of average labour which, in a given society, the average person can perform, productive expenditure of a certain amount of human muscles, nerves, brain, etc. It is simple labour [English economists call it unskilled labour] which any average individual can be trained to do and which in one way or another he has to perform. The characteristics of this average labour are different in different countries and different historical epochs, but in any particular society it appears as something given. The greater part of the labour performed in bourgeois society is simple labour as statistical data show. Whether A works 6 hours producing iron and 6 hours producing linen, and B likewise works 6 hours producing iron and 6 hours producing linen, or A works 12 hours producing iron and B 12 hours producing linen is quite evidently merely a different application of the same labour-time. But what is the position with regard to more complicated labour which, being labour of greater intensity and greater specific gravity, rises above the general level? This kind of labour resolves itself into simple labour; it is simple labour raised to a higher power, so that for example one day of skilled labour may equal three days of simple labour. The laws governing this reduction do not concern us here. It is, however, clear that the reduction is made, for, as exchange-value, the product of highly skilled labour is equivalent, in definite proportions, to the product of simple average labour; thus being equated to a certain amount of this simple labour.

There are at least two problems with reading this passage. First, there is a tension between the notion that the equalization of labor across different employments is an ongoing process (as the analogy with the reduction of organic bodies to air would suggest) and an intimation that this equalization is immediate (in the reference to the "average labor" of a given society). The sentences concerning the reduction of "complicated" to "simple" labor returns to the point of view of an ongoing process, with its own "laws". Second, there is a possibility of reading the passage as claiming that it is the exchange of the products of labor as commodities that actually accomplishes the equalization of different types of concrete labor. The sentence "It is, however, clear that the reduction is made, for, as exchange-value, the product of highly skilled labour is equivalent, in definite proportions, to the product of simple average labour; thus being equated to a certain amount of this simple labour" could be read in this way.

If, as I shall argue in more detail below, Marx was indeed a long-period theorist in the classical political economy tradition, we want to understand the emergence of "universal" labor as an aspect of the ongoing process by which the exchange of products as commodities organizes the social division of labor. Labor is not immediately universal as a result of human physiology, though it is a universal human physiology ("muscles, nerves, brain, etc.") that makes possible the adaptation of the labor force to constantly varying demands of the social division of labor.

In the *CCPE* Marx usually refers to fungible labor as "universal" labor, though as in the quoted passage he characterizes universal labor as an "abstraction". In the first chapter of Volume I of *Capital* Marx unfortunately refers to this concept as "abstract" labor. This seems to me to be a less precise terminology. The word "abstract" has a long use in philosophy to refer to the process by which the human mind recognizes categorical similarities in different concrete instances. For example, "animal" is an abstract category that includes the concrete instances of dogs, bears, cows, and so forth. In the case of concrete labor it seems at first that this notion of abstraction makes sense, because the concrete laboring activities we call weaving, spinning, carpentry, computer programming and so on can be viewed as instances of an abstract category of "labor". The problem is that philosophical abstraction carries with it no implication of quantitative equivalence of the concrete instances. There is no way of reducing a disparate collection of cats, dogs, bears and cows to a certain quantity of "animal". But Marx's conception of universal labor implies precisely a quantitative reduction of any collection of disparate concrete labors to single measurable equivalent in "simple" labor. The term "universal labor" seems better-designed to evoke the idea that training and experience can transform one form of concrete labor into another.

A few sentences later in *CCPE* we read:

> This universal labour-time finds its expression in a universal product, a universal equivalent, a definite amount of materialised labour-time, for which the distinct form of the use-value in which it is manifested as the direct product of one person is a matter of complete indifference, and it can be converted at will into any other form of use-value, in which it appears as the product of any other person. Only as such a universal magnitude does it represent a social magnitude. The labour of an individual can produce exchange-value only if it produces universal equivalents, that is to say, if the individuals labour-time represents universal labour-time or if universal labour-time represents individual labour-time. The effect is the same as if the different individuals had amalgamated their labour-time and allocated different portions of the labour-time at their joint disposal to the various use-values.

This language is potentially confusing because later Marx will characterize the money commodity (say, gold) as the "general equivalent", but the phrase "universal equivalent" here means *any* commodity that can be exchanged for other commodities, not just the money commodity. The producer of cloth can exchange it for food, clothing, housing, or any other commodity in an economy where the social division of labor is organized through commodity exchange. Thus every commodity is "universal" in this sense. Marx is careful to write "This universal labour-time finds its expression in a universal product", consistent with the classical political economy thought-experiment, in which the emergence of universal labor-time is part of the self-organization of the division of labor. But it is all too easy to read this passage as locating the equalization of concrete labors in the exchange of commodities, rather than understanding that it is the equalization of concrete labors through the adaptation of the labor force that ultimately regulates the exchange values of commodities. The last sentence, on the other hand, emphasizes the process by which the exchange of commodities constitutes a system of allocating social labor (and by implication, shaping the training and adaptation of the labor force to the needs of the social division of labor).

4.5 Measuring universal labor

How can we measure the universal (uniform, simple, homogeneous) labor actually being expended in society as a whole or any sector of production? This question becomes acute once we introduce the capitalist law of exchange, or other qualifications of the theory of value that make natural prices non-proportional to labor time expended in the production of commodities. The problem is that when prices of commodities are not proportional to (universal) labor times expended, the value added realized in a branch of production will not generally be proportional to the labor time expended.

It is tempting to take the labor time expended in a sector to be proportional to the wage bill of that sector. This amounts to the assumption that the rate of surplus value (or exploitation) is equalized across sectors by the mobility of labor. Marx in fact puts this idea forward explicitly:

> The fact that capitals employing unequal amounts of living labour produce unequal amounts of surplus-value, presupposes at least to a certain extent that the degree of exploitation or the rate of surplus-value are the same, or that any existing differences in them are equalized by real or imaginary (conventional) grounds of compensation. This would assume competition among labourers and equalization through their continual migration from one sphere of production to another. Such a general rate of surplus-value viewed as a tendency, like all other economic laws has been assumed by us for the sake of theoretical simplification. But in reality it is an actual premise of the capitalist mode of production, although it is more or less obstructed by practical frictions causing more or less considerable local differences, such as the settlement laws for farm-labourers in Britain. But in theory it is assumed that the laws of capitalist production operate in their pure form. In reality there exists only approximation; but, this approximation is the greater, the more developed the capitalist mode of

> production and the less it is adulterated and amalgamated with survivals of former economic conditions. (*Capital* III, 10)

Deriving the equalization of rates of exploitation from the assumption of the mobility of labor, however, raises other questions. The mobility of labor (even with substantial time lags), as we have seen, implies the equalization of conditions of reproduction (or lifetime utility) across different life-cycle paths of training and employment. To derive the equalization of the rate of exploitation from this result, we need the additional assumption that competition among workers forces wages to incorporate uniform allowances for training and experience costs. (In the long-period perspective of the classical political economists competition among capitalists can only temporarily create rents for particular categories of scarce workers.) These wage differentials, given the life-cycle pattern of training and experience, must incorporate interest on training costs (both direct training costs and opportunity costs). A theory of this kind could presumably be developed, but is at best only present in an embryonic form in Marx's writing. For example:

> The fact that capitals employing unequal amounts of living labour produce unequal amounts of surplus-value, presupposes at least to a certain extent that the degree of exploitation or the rate of surplus-value are the same, or that any existing differences in them are equalized by real or imaginary (conventional) grounds of compensation. This would assume competition among labourers and equalization through their continual migration from one sphere of production to another. Such a general rate of surplus-value viewed as a tendency, like all other economic laws has been assumed by us for the sake of theoretical simplification. But in reality it is an actual premise of the capitalist mode of production, although it is more or less obstructed by practical frictions.... (*Capital* III, 10)

What other approach might be taken to estimating the universal (or "abstract") socially necessary labor actually expended in a sector of production except estimating labor time as proportional to the wage bill? Such a method would amount to a theory of universal labor, measuring it in terms of the observable skills, education, and experience of the workers, for example. It is hard to imagine how such a theory could be validated independently as a basis for estimating rates of surplus value across sectors that differ from the social average.

5 Marx as a long-period theorist

The argument of this paper rests heavily on the claim that Marx was a long-period theorist who accepted and developed the classical political economists' analysis of capitalist production based on the concept of natural price. In a passage like the following, it seems clear that Marx is elaborating in his own language the basic long-period method. (In this context Marx refers to the natural price of commodities under the commodity law of exchange as "market-value".)

> It is evident that the real inner laws of capitalist production cannot be explained by the interaction of supply and demand (quite aside from a deeper analysis of these two social motive forces, which would be out of place here), because these laws cannot be observed in their pure state, until supply and demand cease to act, i.e., are equated. In reality, supply and demand never coincide, or, if they do, it is by mere accident, hence scientifically = 0, and to be regarded as not having occurred. But political economy assumes that supply and demand coincide with one another. Why? To be able to study phenomena in their fundamental relations, in the form corresponding to their conception, that is, is to study them independent of the appearances caused by the movement of supply and demand. The other reason is to find the actual tendencies of their movements and to some extent to record them. Since the inconsistencies are of an antagonistic nature, and since they continually succeed one another, they balance out one another through their opposing movements, and their mutual contradiction. Since, therefore, supply and demand never equal one another in any given case, their differences follow one another in such a way and the result of a deviation in one direction is that it calls forth a deviation in the opposite direction that supply and demand are always equated when the whole is viewed over a certain period, but only as an average of past movements, and only as the continuous movement of their contradiction. In this way, the market-

> prices which have deviated from the market-values adjust themselves, as viewed from the standpoint of their average number, to equal the market-values, in that deviations from the latter cancel each other as plus and minus. (*Capital* III, 10)

Marx is also quite clear that natural prices are statistical central tendencies for market prices. In this passage he argues that the free mobility of labor is the underlying mechanism that leads to the emergence of "values" as natural prices for commodities under the commodity law of exchange:

> For prices at which commodities are exchanged to approximately correspond to their values, nothing more is necessary than 1) for the exchange of the various commodities to cease being purely accidental or only occasional; 2) so far as direct exchange of commodities is concerned, for these commodities to be produced on both sides in approximately sufficient quantities to meet mutual requirements, something learned from mutual experience in trading and therefore a natural outgrowth of continued trading; and 3) so far as selling is concerned, for no natural or artificial monopoly to enable either of the contracting sides to sell commodities above their value or to compel them to undersell. By accidental monopoly we mean a monopoly which a buyer or seller acquires through an accidental state of supply and demand. The assumption that the commodities of the various spheres of production are sold at their value merely implies, of course, that their value is the centre of gravity around which their prices fluctuate, and their continual rises and drops tend to equalise. (*Capital* III, 10)

The same mechanism of search of higher remuneration is at work as competition among capitals leads to the emergence of an average rate of profit and of prices of production as natural prices under the capitalist law of exchange:

> But capital withdraws from a sphere with a low rate of profit and invades others, which yield a higher profit. Through this incessant outflow and influx, or, briefly, through its distribution among the various spheres, which depends on how the rate of profit falls here and rises there, it creates

> such a ratio of supply to demand that the average profit in the various spheres of production becomes the same, and values are, therefore, converted into prices of production. (*Capital* III, 10)

Marx explains the importance of mobility of capital and labor-power among sectors to the emergence of prices of production as statistical centers of fluctuation of market prices:

> The incessant equilibration of constant divergences is accomplished so much more quickly, 1) the more mobile the capital, i.e., the more easily it can be shifted from one sphere and from one place to another; 2) the more quickly labour-power can be transferred from one sphere to another and from one production locality to another. The first condition implies complete freedom of trade within the society and the removal of all monopolies with the exception of the natural ones, those, that is, which naturally arise out of the capitalist mode of production.... The second condition implies the abolition of all laws preventing the labourers from transferring from one sphere of production to another and from one local centre of production to another; indifference of the labourer to the nature of his labour; the greatest possible reduction of labour in all spheres of production to simple labour; the elimination of all vocational prejudices among labourers; and last but not least, a subjugation of the labourer to the capitalist mode of production. Further reference to this belongs to a special analysis of competition. (*Capital* III, 10)

These passages constitute Marx's effort to reconstruct and explain in his own words the underlying logic of the long-period method.

6 Universal labor time and universal labor time equivalents

Marx's understanding of the logic of the long-period method provides the context necessary to understand his treatment of the "transformation problem", and perhaps to get some insight into gaps in his exposition that have led to so much controversy over his discussion of this point.

To recapitulate, the "theory of value" for the classical political economists is the whole account of the abstract thought-experiments analyzing how the division of labor might be self-organized by decentralized exchange of commodities under conditions of free mobility of labor (in the first instance, leading to the commodity law of exchange) and of labor and capital (in the second instance, leading to the capitalist law of exchange). Labor in pursuit of its best conditions for reproduction will tend to move so that natural prices of commodities average out to a level proportional to the labor time required for their production. This process allocates the fungible, "universal" labor of the society to the concrete forms (including skill levels) required for social reproduction through the division of labor. Money prices and exchange values on average represent universal labor-time, so that Marx tends in this setting to use the term "value" to refer to both socially necessary labor-time itself and to the natural price around which market prices fluctuate.

When means of production become a non-negligible part of the conditions of production, and a class of capitalists who can finance the acquisition of means of production takes control of the allocation of labor, their pursuit of the highest profit rate will tend to move labor so as to enforce prices of production as the natural prices of the system. The free mobility of labor continues to play a critical role in this process in enforcing the uniformity of the wage, and, by extension, uniformity of the rate of surplus value across sectors.

The problems posed by the "transformation problem" in Marx's tables is to understand in what sense he thought it relevant to compare economies operating under the commodity law of exchange and the capitalist law of exchange. The aim of the comparison is clear enough: Marx wants to show that the capitalist law of exchange is simply redistributing surplus value, so that the theory of exploitation still holds, even quantitatively.

One problem with this discussion is that Marx actually introduces a third, intermediate thought-experiment into the picture. In this intermediate situation a capitalist class controls the means of production, so that workers must sell their labor-power to capitalists at a natural wage corresponding to a value of labor-power in order to participate in the division of labor. These capitalists as a result appropriate surplus value and exploit labor. But natural prices in this intermediate thought-experiment are "values" proportional to necessary social labor time, and as a result profit rates are not equalized.

Thus we have a mixed picture: capitalist social relations of production but no free mobility of capital regulating the exchange of commodities to equalize the rate of profit. The tables he creates to illustrate the redistribution of surplus value actually compare a capitalist organization of the economy with equalization of the rate of profit to this intermediate concept. In this intermediate thought-experiment the exploitation of labor is still transparent because commodities exchange on average over time at prices that reflect the amount of universal labor required to produce them. Thus the average money price of the commodities required to reproduce worker-households will reflect the universal labor time contained in that bundle of commodities, and the surplus value appropriated by the capitalists will reflect the universal labor time contained in whatever bundle of commodities they purchase for their own consumption or for expanding production.

When we move from this intermediate thought-experiment to allowing free mobility of capital to equalize the profit rate (on average over time) it is clear enough that the economy is still allocating the same universal labor. But the social labor time required to produce any given commodity may change because now capitalists are choosing techniques to minimize costs given the average profit rate. Furthermore the prices of commodities may now deviate from the socially necessary labor time required to produce them because of the redistribution of surplus value to equalize the profit rate (on average over time). Thus there are two ways of equating commodities to universal labor time. One way is to measure the universal labor time actually embodied in the commodity or bundle of commodities; the other way is to measure the universal labor time equivalent of the price of the bundle of commodities using the *MELT*. In the intermediate thought-experiment discussed above these two methods will always lead to the same quantitative result, because under the commodity law of exchange natural prices are proportional to embodied universal labor times. But in the thought-experiment corresponding to the capitalist law of exchange embodied universal labor coefficients may deviate from the universal labor time equivalents of the prices of commodities.

It is evident that the surplus value collectively appropriated by the capitalists under the capitalist law of exchange represents a surplus value and surplus labor time arising from the exploitation of the workers in the sense that the universal labor time equivalent of the wage falls short of the labor time workers actually perform. In this sense Marx's claim that capitalist competition redistributes surplus value holds up. But it is not necessarily the same surplus value as in the intermediate thought-experiment, both because the choice of techniques has changed and because the universal labor time equivalent of the wage may deviate from the universal labor time embodied in workers' consumption.

This line of thinking suggests that what Marx should have been doing in his discussion of the "transformation problem" was to start with the thought-experiment corresponding to the capitalist law of exchange, and show how the resulting allocation of universal labor represented the exploitation of labor and how to measure the degree of this exploitation. This would have been more consistent with the long-period method than the introduction of the intermediate thought-experiment which corresponds to no actual abstract account of capitalist production. We can carry out this alternative analysis on the assumption that the mobility of labor will equalize the wage and the rate of surplus value across sectors. The rate of surplus value can be measured as the ratio of surplus value to variable capital for the economy as a whole. When this ratio is applied to individual sectors, we get a measure of the amount of surplus value being moved to or from the sector by the equalization of the rate of profit. This analysis amounts to operating with universal labor time equivalents of commodity prices.

7 Reproduction and exploitation

In Volume I of *Capital* Marx develops a powerful image of the "Working Day" to explain the relation between exploitation and reproduction in capitalist economies. Here he conceptualizes the whole social labor time as a single working day of an average worker, looked at from three points of view: reproduction in terms of necessary and surplus labor time, exploitation in terms of paid and unpaid labor time, and capitalist profitability in terms of the division of value added between wages and profits. From the point of view of reproduction the average worker has to work a certain number of hours each day to produce the products the worker household consumes to reproduce itself. The working day, however, is extended beyond this labor time, resulting in a surplus labor time. From the point of view of exploitation, the worker is paid a wage that represents the value equivalent of a certain number of hours, but actually produces a larger value. Thus the worker receives no equivalent in the form of the wage for some of the labor time actually expended and is exploited. From the point of view of profitability, the capitalist lays out constant capital, which on average returns in the sales price of the commodity unchanged, and variable capital to buy labor-power, but appropriates the whole value added in the produced commodities, thus securing a surplus-value.

Under the commodity law of exchange these three ways of looking at the working day are quantitatively identical. The necessary labor time is proportional to paid labor time, which is proportional to variable capital, while surplus labor time is proportional to unpaid labor time which is proportional to surplus value. The common factor of proportionality is the *MELT* which translates between universal labor time and money.

Under the capitalist law of exchange, however, proportionality can be sustained between only two of these ratios. Because the universal labor embodied in the commodities workers consume may not be equal to the universal labor time equivalent of the wage, the ratio of surplus labor time to necessary labor time may not be equal to the ratio of unpaid labor time to paid labor time. Marx's claim that realized money profits (surplus value) arise from exploitation through unpaid labor time holds if and only if we interpret the universal labor time equivalent of the wage as the measure of paid labor time. Critics of Marx's theory of exploitation correctly point out that there is a quantitative discrepancy between the rate of surplus value measured in these terms and the ratio of surplus to necessary labor time measured directly in universal labor time.

A socialist society would also in some manner or other be allocating universal labor time to meet the requirements of a division of labor. Marx insists that a socialist society will have to generate a surplus product from surplus labor time, but will enforce a social control over this surplus product. The point of view of reproduction in the working day is directly relevant to this point. If paid labor time is proportional to necessary labor time in capitalist society, then the surplus labor time potentially available to a socialist society after a revolutionary political transformation would be proportional to the surplus value appropriated by capitalists. But a more rigorous thinking-through of the long-period logic suggests that a socialist society would choose different techniques of production and distribute the social product according to different principles than capitalist society. Thus the reproductive allocation of capitalist society would not be a very relevant guide to the potential of a socialist society. The larger implications of the long-period method, pointing to the division of labor and the need for allocating universal labor in some manner or other, are, on the other hand, completely central to the problem of socialism.

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